



JOURNAL OF PHILOSOPHY AND CONTEMPORARY ISSUES

Volume 1, Number 1 (June, 2025)

ISSN: 1595-9457 (online); 3093-060X (print)

Website: <https://jppssuniuyo.com/jpci> Email: jppssuniuyo@gmail.com

Received: June 11, 2025 Accepted: July 01, 2025 Published: July 31, 2025

Citation: Eguavoen, Jeffrey O. & Airhiavbere, Amenze S. (2025). "Digital Banking and Banking Sector Development in Nigeria." *Journal of Philosophy and Contemporary Issues*, 1 (1): 9-20.

Article

Open Access

DIGITAL BANKING AND BANKING SECTOR DEVELOPMENT IN NIGERIA

Jeffrey Ogie Eguavoen ¹

Amenze Sandra Airhiavbere ²

Department of Finance, University of Benin, Nigeria ^{1 & 2}

Corresponding Email: jeffreyogie@uniben.edu ¹

Abstract

The study empirically examined the impact of digital banking on banking sector development in Nigeria for the period 2009 to 2023. The specific objectives of the study were to ascertain whether automated teller machine (ATM), point of sales terminal (POS), internet banking (INTB) and mobile money transfer (MMT) transactions impact on banking sector development (BSD) in Nigeria. The autoregressive distributed lags (ARDL) technique was utilized for the analysis of data and the results demonstrated that, automated teller machine (ATM) has significant negative effect on banking sector development in Nigeria in the short-run; but in the long-run, it failed the 5 percent significant level. Point of sales terminal (POS) transaction has significant positive impact on banking sector development (BSD) in Nigeria in the short-run but does not in the long-run. Internet banking (INTB) transaction has significant negative impact on banking sector development in Nigeria both in the short-run and in the long-run. Mobile money transfer (MMT) transaction is seen not to be significantly related to banking sector development in Nigeria in the short-run as well as in the long-run. The study therefore recommends that, management of banks should continue to ensure that more ATM stands or points where customers can easily withdraw money are provided especially for those who are in hard-to-reach areas. Regular and routine servicing and monitoring of these ATM machines must also be carried out.

Keywords: Digital Banking, Banking Sector Development, Automated Teller Machine, Point of Sales

JEL Classification: G21, Q55.

Introduction

Copyright © 2025 By JPCI. Publishers: Omega Books

This is an open access article which permits unrestricted use provided the work is properly cited.

Globally, the banking sector has played a vital role in both financial stability and economic growth. In the past, banks have played vital role in promoting savings, lending and investments - all of which are essential for stability and economic growth (Nguyen, 2022). However, the way that banking services are provided to customers has changed dramatically in the last few decades due to technological improvements, especially in the areas of the internet and mobile technologies. When digital technologies are incorporated into banking services, banks are able to provide online and mobile banking platforms for a variety of financial services, ranging from loans and investment management to payments and money transfers (Shkurdoda & Puczyk, 2025; Lavanya & Dunstan, 2024). This change is commonly referred to as digital banking.

With the advent of the internet in the late 20th century, customers were able to access banking services outside of conventional branch locations, which led to the emergence of digital banking. Banks started using digital channels to provide for the increasing need for convenience and round-the-clock access to financial services as internet usage increased globally, especially in industrialized countries (Ranjan, 2024). Users can now effectively manage their accounts without having to visit a branch owing to digital banking systems like mobile banking applications and online banking websites (Ranjan, 2024). Digital banking usage is also in line with the growing trend of banking automation, which uses machine learning and artificial intelligence (AI) to improve customer service and streamline banking processes. Banks can save operating costs, provide immediate customer service, and customize the banking experience with AI-powered chatbots (Oyeniya, Ugochukwu, & Mhlango, 2024; Oyetunji, 2024). Furthermore, blockchain technology has become well-known in digital banking because it provides a safe, decentralized way to record transactions, lowering the possibility of fraud and increasing transparency (Ahmed, 2025; Rahman, Yii, Masli, & Voon, 2024). Additionally, digital banking has shown itself to be an efficient tool for financial inclusion in developing countries, offering banking services in places where traditional brick-and-mortar branches are either nonexistent or very limited (Nnaomah et al., 2024). With financial technology (FinTech) firms developing alternative financial products like peer-to-peer lending and blockchain-based services, digital banking has further paved the way for innovation in the banking sector and is revolutionizing the financial sector (Barroso & Laborda, 2022; Feyen et al., 2021). Numerous benefits, like increased convenience, reduced transaction costs, and improved access to financial services, have come with the growth of digital banking, but there are also unexpected challenges. The need for strong regulatory frameworks to regulate the digital banking environment, data privacy concerns, and the increasing danger of cyber-security attacks are among the main worries (Alzoubi et al., 2022). The banking industry must strike a balance between innovation and security, compliance, and customer protection as digital banking continues to grow internationally.

Studying how digital banking affects the larger banking industry, especially how it propels sectoral development, is imperative given this dynamic and quickly changing environment. Furthermore, there is currently no empirical investigation, to the best of our knowledge, on the overall effect of digital banking on the banking sector in developing countries like Nigeria, despite the fact that it has the potential to increase financial inclusion, efficiency, and innovation. There are still a number of unresolved issues about how digital banking affects the growth of the banking industry. Moreover, despite a great deal of study on digital banking and its effects on different components of banking sector development, there are still a number significant gaps that need to be filled. The majority of the literature now in publication concentrates on financial inclusion, the adoption of digital banking, bank profitability, and cashless policies; nevertheless, the long-run impacts of digital banking on banking sector

development in Nigeria still need empirical research. Longitudinal studies evaluating the long-run impacts of digital banking on banking sector development are also lacking. This study therefore seeks to investigate digital banking and its impact on banking sector development in Nigeria. The subsequent sections present the literature review, methodology, results and discussions and conclusion and recommendations.

Literature Review

Conceptual Review

Digital Banking: According to Shkurdoda and Puczyk (2025), digital banking is the incorporation of digital technologies into banking services, which allows financial institutions to provide seamless electronic transactions across a range of digital platforms. Internet banking, contactless payments, mobile banking, point-of-sale (POS) transactions, automated teller machines (ATMs), and blockchain-based financial operations are just a few of the many services it includes. Rapid developments in information and communication technologies (ICTs), rising smartphone adoption, the accessibility of high-speed internet and the rising need for quick and easy banking services have all contributed to the growth of digital banking. Numerous technological advancements that redefine conventional banking paradigms are included in digital banking (Ranjan, 2024). Internet banking (online banking), point-of-sale (POS), mobile banking, and automated teller machines (ATMs), FinTech developments (digital wallets, peer-to-peer lending, blockchain technology), and automation and artificial intelligence (AI) are the main elements of digital banking. Its impact has been felt in the areas of operational efficiency and cost reduction, enhanced financial inclusion and access, financial product development and innovation, bolstering financial security and preventing fraud, and regulations and policies (Bueno et al., 2024; Shikha & Singh, 2024).

Banking Sector Development: Banking sector development describes the increase in the capacity of the banking sector to carry out its functions efficiently (Aluko & Ajayi, 2018). The evolution, modernization, and growth of financial institutions with the goal of enhancing financial intermediation, efficiency, accessibility, and economic stability constitute banking sector development. Cihák, Demirgüç-Kunt, Feyen, and Levine (2013) distinguish four aspects of banking sector development: stability, depth, efficiency, and access. They observe that while these dimensions may not fully capture the features of the financial sector, they do, for the most part, mirror the areas of concentration of the majority of empirical research. Numerous banking sector development metrics, which emphasize advancements in financial access, service quality, profitability, and regulatory compliance, are used to evaluate the effects of digital banking. These metrics include regulatory and security compliance, client accessibility and satisfaction, bank profitability and efficiency, and financial inclusion.

Theoretical Review

The theoretical review offers the fundamental theories that clarify the connection between digital banking and banking sector development. Understanding the adoption, diffusion and economic implications of digital banking technologies is made easier by a number of theories. Three major theories are examined in this section: the Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI) Theory, as well as the Financial Intermediation Theory (FIT).

Technology Acceptance Model

Davis (1989) developed the Technology Acceptance Model (TAM) to depict how people embrace and utilize innovative technology. It describes the elements affecting the adoption of online banking. Perceived Ease of Use (PEOU), or how much an individual believes that utilizing a method will be effortless, and Perceived Usefulness (PU), or how much an individual believes that a method will enhance their daily activities or job routine, are the two main factors that determine whether or not people adopt a particular technology, according to the model. TAM aids in explaining how consumers behave when utilizing online and mobile banking platforms in the context of digital banking. Customers are more inclined to stick with digital banking if they believe it to be helpful, which increases adoption rates and customer retention (Davis et al., 1989). Banks may use TAM to pinpoint adoption hurdles and put plans in place to promote more use of digital banking, which will ultimately support banking sector development.

Diffusion of Innovation Theory

Rogers (1962) propounded the Diffusion of Innovation (DOI) theory which depicts how novel concepts, innovations, and goods gradually penetrate a society. It explains how various user groups adopt digital banking. Innovators, early adopters, early majority, late majority, and laggards are the five user categories identified by the theory as influencing the rate of acceptance of an innovation (Rogers, 2003). DOI theory is crucial to comprehending how digital banking expands throughout various socioeconomic and demographic groups. Banks can better plan their marketing campaigns and create regulations that encourage the quick uptake of digital banking services by using DOI theory.

Financial Intermediation Theory

The crucial function that banks play as middlemen between savers and borrowers is explained by Schumpeter's 1934 proposal of the Financial Intermediation Theory (FIT). It emphasizes how banks contribute to economic development and how digital banking strengthens this role. Effective financial intermediation fosters economic growth by guaranteeing that capital is distributed where it is most needed, and that banks mobilize savings and channel them toward profitable investments. By improving credit availability, lowering transaction costs, and growing financial services, digital banking has revolutionized financial intermediation. Through innovations like online loan applications, computerized credit scoring, and peer-to-peer (P2P) lending platforms, digital banking platforms have increased credit accessibility. Digital banking improves economic activity, fosters sustainable banking sector development, and increases financial efficiency by reinforcing financial intermediation. To sum up, the TAM, DOI, and FIT theories offer a strong theoretical framework for comprehending how digital banking contributes to banking sector development. TAM describes how ease of use and perceived usefulness determines its adoption. While the FIT emphasizes how digital banking improves financial accessibility and economic growth, the DOI theory emphasizes how digital banking spreads among various user groups. All of these theories lend credence to the claim that banking sector development depends on digital banking.

Empirical Literature

The impact of digital banking on banking sector development has been a subject of empirical inquiry. Enueshike, Oluchukwu, and Ajidani (2025) investigated the effect of cashless policy on financial sector development in Nigeria utilizing annual time series data for the period 2012 to 2022. Mobile banking, POS and ATM served as the independent variables. The study employed VAR method along with the Philips-Perron test (PPT) to evaluate the stationarity properties of the variables. Ordinary least square (OLS) procedure was used to verify the robustness of the

model while error correction model (ECM) was used to establish the speed of adjustment. Results show that there is positive connection between ATM and financial sector development. The result also shows that POS and mobile banking exerted an inverse and significant effect on financial sector development. Setiawan and Prakoso (2024) investigated the correlation between digital banking adoption and the bank performance (proxied by return on assets and operational efficiency ratio) in Indonesia with a moderating variable of bank size. The results of the study, which used panel data regression, demonstrate that the adoption of digital banking significantly improves the operational efficiency ratio while having a considerable negative influence on return on assets. Both the beneficial effects of digital banking adoption on the operational efficiency ratio and the negative effects on return on assets were weakened by bank size.

Ubah, Adigwe, Okaro and John (2023) investigated the impacted of digital banking on financial inclusion in Nigeria utilizing data within the timeframe of 2010 to 2021. Financial deepening proxied for financial inclusion while POS, web banking and USSD were the independent variables. The study data was evaluated utilizing the ordinary least square (OLS) technique. Results reveal that POS and USSD banking exerted a significant impact on financial inclusion whereas there was no significant connection between web banking and financial inclusion. Udobi-Owoloja et al. (2020) examined the impact of digital banking channels on banks' profitability in Nigeria utilizing data collected from ten (10) deposit money banks. The findings indicate that the profit margins of banks were impacted by ATM, mobile banking, online and internet banking, Unstructured Supplementary Service Data (USSD) and POS channels. The profitability of banks was positively and significantly impacted by digital banking as well. Anarfo, Abor, Osei, and Gyeke-Dako (2019) used a panel vector autoregressive framework to examine the link between financial sector development and financial inclusion in Sub-Saharan Africa (SSA). The findings indicate that financial sector development (FSD) and financial inclusion are inversely causally related in both the overall sample and the sample of countries in SSA. From the study's findings, FSD is influenced by financial inclusion and vice versa.

Methodology

Model Specification: The model of analysis follows a linear combination of explanatory time series variables and the dependent variable, which is ratio of credit to the private sector divided by Gross Domestic product (GDP), was used as a proxy for banking sector development (BSD) in Nigeria. To estimate the effect of digital banking on banking sector development (BSD), we hypothesized four (4) digital banking variables that could capture the impact of the various transmission channels. These variables include automated teller machine (ATM), point of sales (POS), internet banking (INTB) and mobile money transfer (MMT) transactions. Thus, the structural model to estimate this relationship is stated as follows:

$$BSD = f(ATM, POS, INTB, MMT).....(3.1)$$

Hence, the econometric form of the model is as follow:

$$BSD_t = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 INTB_t + \beta_4 MMT_t + U_t.....(3.2)$$

Where: BSD_t = Banking Sector Development (BSD) (measured as ratio of credit to the private sector to GDP); ATM_t = Total value of automated teller machines (ATM) transactions; POS_t = total value of point of sales (POS) transactions; $INTB_t$ = Total value of internet banking (INTB) transactions; MMT_t = total value of mobile money transfer (MMT) transactions; β_0 = Constant; U_t = Stochastic error term.

The a priori expectation of the explanatory variables is $\beta_1, \beta_2, \beta_3, \beta_4 > 0$

Variable Description and Measurement

The variables that were employed are listed in Table 1 along with the a priori expectation and the prior researchers that utilised the variable in their study.

Table 1: Variable Measurements

SN	Variables	Types of Variables	Variable Measurements	Previous Researchers that utilized the Variables	A priori Expectation
1	Banking Sector Development (BSD)	Dependent	Measured as ratio of credit to the private sector to GDP	Iyoha 2015	
2	Automated Teller Machine (ATM)	Independent	Measured as the total value of ATM transactions in Nigeria	Ibekwe, Ibekwe and Morah (2023)	(+)
3	Point of Sales (POS)	Independent	Measured as the total value of POS transactions in Nigeria	Adeleye (2022)	(+)
4	Internet Banking (INTB)	Independent	Measured by the total value of INTB transactions in Nigeria	Ajibola, Alalade and Akinrin (2024)	(+)
5	Mobile Money Transfer (MMT)	Independent	Measured as the total value of MMT transactions in Nigeria	Abiola (2022)	(+)

Source: Authors' Compilations (2025)

Data Sources

The population of this investigation which also constitutes the sample size is all the quoted deposit money banks (DMBs) in Nigeria. As at December 31, 2023, a total of 14 banks were quoted on the Nigerian Exchange Limited (NGX). The convenience sampling method was adopted in the selection of samples for this study. Hence, a total of 14 listed banks were used in this study for the period 2009 to 2023. This study used quarterly data sourced from the NGX and the Central Bank of Nigeria Statistical Bulletin (2023). The reason for the choice of this period is based on the fact that it is the period in which electronics banking actually began in Nigeria. Thus, this will enable us to have a more realistic evaluation of the hypothesized impact of digital on banking sector development in Nigeria.

Method of Analysis

The data in this study was analyzed using the Autoregressive Distributed Lags (ARDL) and the unit root test. The unit roots are examined, and the stationarity characteristics of the data are assessed, using the Augmented Dickey Fuller (ADF) test. The Autoregressive Distributed Lags (ARDL) technique is used in the study to model integration interactions. This method's main benefit is that it may be applied regardless of how stationary the variables in the sample are, and it allows for conclusions about long-run estimations that are not possible with other cointegration techniques. The parsimonious ECM is used because it can combine short-run and long-run properties to produce an efficient estimate; thereby providing room for much flexibility. Finally, post regression test of Breusch-Godfrey serial correlation test was used to ensure the absence of serial correlation in the model.

Results and Discussion

Unit Root Analysis: The unit roots are examined using the Augmented Dickey Fuller (ADF) test. Table 2 displays the results in levels and first difference. Each variable's ADF test statistic is displayed in the second and fifth columns of the result, while the third and sixth columns, respectively, display the 95 percent critical ADF value. The result reveals that all the variables are not stationary at level, except BSD that was stationary. However, after the first difference was taken, all the variables were now stationary. This suggests that the variables achieve stationarity after their first differences, indicating that they are in fact difference-stationary. Therefore, the hypothesis that the variables have unit roots would be accepted. In fact, the variables are integrated of order one (i.e., $I(1)$).

Table 2: Unit Root Tests

Variables	At Levels				Remark	First Difference				Remark
	ADF Statistic	Test	95% ADF Value	Critical		ADF Statistic	Test	95% ADF Value	Critical	
BSD	-3.845095		-3.119910		Stationary	-3.685898		-3.119910		Stationary
ATM	-1.451111		-3.098896		Non-Stationary	-5.374236		-3.144920		Stationary
POS	-1.915275		-3.098896		Non-Stationary	-3.565122		-3.119910		Stationary
INTB	-1.959136		-3.098896		Non-stationary	-3.305412		-3.144920		Stationary
MMT	-1.907025		-3.098896		Non-Stationary	-4.430041		-3.119910		Stationary

Source: Authors' Computation (2025)

Bound Test for Cointegration

To determine whether there is a long-run link between the variables, the results of the bounds test (for cointegration) are shown in Table 3. Therefore, the null hypothesis in this bounds test is that there is no link between levels. Thus, we can conclude that there is cointegration (i.e., a long-run relationship) if the computed F-statistic is higher than the critical value for the upper bound $I(1)$; if it is lower than the lower bound $I(0)$, there is no cointegration. Accordingly, Table 3's results demonstrate that, at the 5% significance level, the F-statistic value of 24.30564 is more than the upper bound $I(1)$ value of 3.49. We therefore draw the conclusion that there is a long-run relationship between the model's hypothesized variables.

Table 3: Bounds Test for Cointegration Result

Test Statistic	Value	Significant	$I(0)$	$I(1)$
F-statistic	24.30564	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Authors' Compilations (2025)

The ARDL Error Correction Regression Result (Short-Run Result)

The short-run dynamics of the impact of digital banking on banking sector development in Nigeria is captured within an error correction model (ECM). For the ECM, the Autoregressive Distributed Lags (ARDL) method is employed. The parsimonious equation was chosen using the

R-Bar squared criterion. Table 4 displays the outcome of the estimated error correction representation. The findings demonstrate a strong diagnostic outcome; the R-squared value of 0.97 is extremely high and shows that short-run changes in the explanatory variables, such as the ECM, account for more than 97% of the systematic variation in Nigeria's banking sector development (BSD) over the short-term. Even the 0.96 R-Bar squared value is extremely high.

Table 4: ARDL ECM Results

ECM Regression			
Case 2: Restricted Constant and No Trend			
Variables	Coefficient	T-Ratio	Prob.
D(ATM)	-0.002590	-13.29212	0.0002**
D(POS)	0.005984	13.61926	0.0002**
D(INTB)	-0.018483	-16.16423	0.0001**
D(MMT)	-0.001428	-1.607134	0.1833
CointEq(-1)*	-1.007524	-18.11425	0.0001**
R ² = 0.97	\bar{R}^2 = 0.96		D.W. = 2.42

Source: Authors' Compilations (2025) Note: ** sig at 1% level; *sig at 5% level.

The automated teller machine (ATM) coefficient has a significant negative short-term impact on the banking sector development (BSD) in Nigeria, based on an analysis of the individual coefficients of the variables in terms of their significance and impact; the variable passed the 1 percent significance level. This indicates that the general performance of DMBs has been considerably impacted by the total value of money taken out via ATMs. In fact, it is seen that throughout the short-term, a unit increase in ATM usage lowers banking sector development (BSD) by roughly -0.26 percent. This further implies that there is need for management of banks to rethink and re-strategize on the effective way to best utilize ATM such that it has positive effect on banking sector development (BSD). Even the previous value of automated teller machine (D(ATM(-1))) is also negatively signed and passes 5 percent level of significance, suggesting that previous value of ATM is also effectual in determining the development of banking sector in Nigeria in the short-run.

In a similar vein, coefficient of point of sales (POS) transaction has considerable positive effect on banking sector development (BSD) in the short-run. Indeed, it is seen that as value of POS rises, banking sector development (BSD) also rises with about 0.005984 percent. This means that POS usage in Nigeria is a major factor for banking sector development. On the other hand, those of internet banking (INTB) has significant negative impact on banking sector development, suggesting that a unit increase in the usage of internet banking (INTB) in Nigeria reduces banking sector development by approximately -1.85 percent. Also, mobile money transfer (MMT) is seen not to be significantly related to banking sector development in Nigeria in the short-term, as it failed the 5 percent level of significance. In Table 4, the coefficient of the ECM term (shown by CointEq(-1)*) has the appropriate negative sign and is statistically significant at the 1 percent level. This demonstrates that any short-term departure from equilibrium of the predicted financial technology variables can be corrected over time. The error correction term's low value of -1.007524 indicates that there will be little long-term adjustment to equilibrium. According to the ECM term, the first year accounts for around 1% of the long-term adjustment to equilibrium. The model does not have an autocorrelation issue, as indicated by the DW statistic value of 2.42.

ARDL Long-Run Results

The long-run results as presented in Table 5 indicate that internet banking (INTB) transactions is the only digital banking variables significantly affecting banking sector development (BSD) in the long-run. The variable exert significant adverse effect on banking sector development, as it was considerable at the 5 percent levels; suggesting that as these variables rise, banking sector development (BSD) reduces by approximately -0.023742 approximately. Hence, in the determination of the level of banking sector development in the long-run, internet banking (INTB) is a crucial factor that should not be ignored.

The other hypothesized variables in the model such as ATM, POS and MMT transactions failed at the 5 percent significance level. The implication is that these variables do not play any significant role in banking sector development in the long-run.

Table 5: ARDL Long Run Results

Levels Equation			
Case 2: Restricted Constant and No Trend			
Variables	Coefficient	T-Ratio	Prob.
ATM	0.000690	2.109818	0.1025
POS	0.000197	0.131793	0.9015
INTB	-0.023742	-3.115191	0.0357*
MMT	0.004335	1.425457	0.2272
Constant	19.09952	50.89714	0.0000

Source: Authors' Compilations (2025). Note: *sig at 5% level.

Breusch-Godfrey Serial Correlation LM Test

As shown in Table 6 below, we employed the Breusch-Godfrey Serial Correlation LM Test to determine whether the model's residuals are serially correlated in the estimation. In fact, based on the results, we will not be able to reject the null hypothesis because the F-Statistic p-value of 0.6306 shows that the residuals are serially uncorrelated. The residuals are serially uncorrelated as a result.

Table 6: Breusch-Godfrey Serial Correlation LM Test

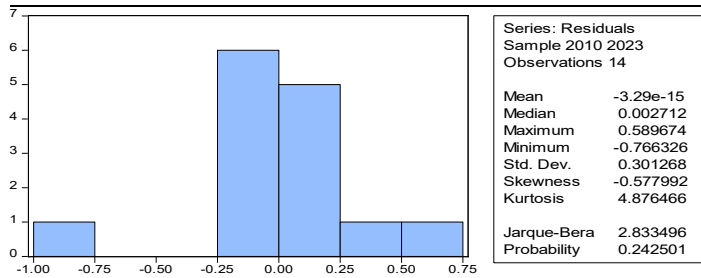
F-statistic	0.284836	Prob. F(1,3)	0.6306
Obs*R-squared	1.213972	Prob. Chi-Square(1)	0.2705

Source: Authors' Compilation (2025)

Normality Test

We used the histogram normality test (HNT) to check for normality. The alternative hypothesis, as per this test, is that the residuals are not normally distributed, while the null hypothesis is that they are. Therefore, we accept the null hypothesis that the residuals are normally distributed if the probability value of the Jarque-Bera statistics is greater than 0.05 (5%); on the other hand, we reject the null hypothesis that the residuals are not normally distributed if the probability value of the Jarque-Bera statistics is less than 0.05 (5%). Consequently, we deduce that the data set is normally distributed since the probability value (0.242501) of the Jarque-Bera statistics in Figure 1 is higher than 0.05 (5%).

Figure 1: Histogram Normality Test



Source: Authors' Computation from Eview 10 output (2025)

Conclusion and Policy Recommendations

The study empirically examined the effect of digital banking on banking sector development in Nigeria from 2009 to 2023. The justification for this study was due to the fact that digital banking significantly affected banking sector development across the globe. Therefore, in order to find out this submission in Nigeria, this study was carried out utilizing the autoregressive distributed lags (ARDL) procedure. The results from the analysis signify that the automated teller machine (ATM) transaction has significant negative on banking sector development in Nigeria in the short-run; but in the long run, it failed the 5 percent significant level. Point of sales terminal (POS) transaction has significant positive impact on banking sector development (BSD) in the short-run. But in the long-run, it does not exert any considerable effect banking sector development in Nigeria. Internet banking (INTB) transaction has significant negative impact on banking sector development in whether at in the short-run or in the long-run. Mobile money transfer (MMT) transaction is seen not to be significantly related to banking sector development in the short-run as well as in the long-run. The variable failed the 5 percent significant level. It is therefore the conclusion of this study that in the determining banking sector development in Nigeria, automated teller machine (ATM), point of sales terminal (POS) and internet banking (INTB) transactions are the only variables to be considered in this regard. Given the study's conclusions, three explicit policy recommendations are made:

- i. The use of automated teller machine has demonstrated to be an effectual tool for determining deposit money banks performance in Nigeria. Thus, management of banks should continue to ensure that more ATM stands or points where customers can easily withdraw money should be provided especially for those who are in hard-to-reach areas. Regular and routine servicing and monitoring of these ATM machines must be carried out.
- ii. In order to sustain this current positive development, there is need to either sustain or expand the existing policy framework for ATM and POS by monetary authority (CBN) to increase the current number of ATM and POS in all nukes and craning of Nigeria, including the hard to reach areas in rural communities across the 36 states in Nigeria. This will help to ensure that these two financial technology factors continue to have the needed positive impact on the performance of DMBs in Nigeria.

References

- Ahmed, I. E. (2025). Analyzing the impact of blockchain technology on banking transaction costs using the random forest method. *Front. Blockchain* 8:1551970. doi:10.3389/fblo c.2025.1551970
- Ajibola, J. O., Alalade, Y. S., & Akinrin, S. B. (2024). Cashless economy initiatives in enhancing profitability metrics of Nigeria deposit money banks. *Nigerian Journal of Banking and Financial Issues*, 10(2), 14-32.

- Aluko, O. A., & Ajayi, M. A. (2018). Determinants of banking sector development: Evidence from Sub-Saharan African countries, *Borsa Istanbul Review*, 18(2), 122-139. <https://doi.org/10.1016/j.bir.2017.11.002>
- Alzoubi; H. M., Ghazal; T. M. Hasan; M. K., Alketbi; A., Kamran; R., & Al-Dmour, N. A. (2022). cyber security threats on digital banking. *A Paper Presented at the 1st International Conference on AI in Cybersecurity (ICAIC)*, Victoria, TX, USA, 2022, 1-4, doi:10.1109/ICAIC53980.2022.9896966.
- Anarfo, E. B., Abor, J. Y., Osei, K. A. & Gyeke-Dako, A. (2019). Financial inclusion and financial sector development in Sub-Saharan Africa: a panel VAR approach. *International Journal of Managerial Finance*, 15(4), 444-463. <https://doi.org/10.1108/IJMF-07-2018-0205>
- Barroso, M. & Laborda, J. (2022). Digital transformation and the emergence of the Fintech sector: Systematic literature review. *Digital Business*, 2(2), 1-18. <https://doi.org/10.1016/j.digbus.2022.100028>
- Bueno, L. A., Sigahi, T. F., Rampasso, I. S., Filho, W. L. & Anholon, R. (2024). Impacts of digitization on operational efficiency in the banking sector: Thematic analysis and research agenda proposal. *International Journal of Information Management Data Insights*, 4(1), 112. <https://doi.org/10.1016/j.jjime.2024.100230>
- Cihák, M., Demirgüç-Kunt, A., Feyen, E., & Levine, R. (2013). Financial development in 205 economies, 1960 to 2010. *Journal of Financial Perspectives*, 1(2), 17-36. <https://ssrn.com/abstract=3076895>
- Davis, F. D. (1985). *A technology acceptance model for empirically testing new end-user information systems: Theory and results*. Massachusetts Institute of Technology. <http://hdl.handle.net/1721.1/15192>.
- Enueshike, P., Oluchukwu, A. D., & Ajidani, M. S. (2025). Effect of cashless policy on financial sector development in Nigeria. *International Journal of Finance*, 10 (2), 13-28. <https://dx.doi.org/10.47941/ijf.2546>
- Feyen, E., Frost, J., Gambacorta, L., Natarajan, H., & Saal, M. (2021). Fintech and the digital transformation of financial services: Implications for market structure and public policy. *BIS Papers No 117, The Bank for International Settlements and the World Bank Group*. <https://www.bis.org/publ/bppdf/bispap117.pdf>
- Ibekwe, A. O., Ibekwe, A. I., & Morah, C. C. (2023). Effect of cashless banking on the performance of deposit money banks in Nigeria. *Academia Networks International Journal of Management Studies*, 8(4), 221-235. DOI: 26044295521854
- Iyoha, M. A. (2015). Economic growth and human development: evidence from Nigeria. *International Journal of Social Economics*, 42(1), 55-68.
- Lavanya, B., & Dunstan, R. A. (2024). Paradigm shift in the digital transformation of the banking sector: A bibliometric analysis. *International Journal of Advanced and Applied Sciences*, 11(3) 2024, 115-126. <https://doi.org/10.21833/ijaas.2024.03.013>
- Nguyen, P, T. (2022). The impact of banking sector development on economic growth: The case of Vietnam's transitional economy. *Journal of Risk and Financial Management*. 15(8), 358. <https://doi.org/10.3390/jrfm15080358>
- Nnaomah, U. I., Aderemi, S. Olutimehin, D. O., Orieno, O. H., & Ogundipe, D. O. (2024). Digital banking and financial inclusion: A review of practices in the USA and Nigeria. *Finance & Accounting Research Journal*, 6(3), 463-490. <http://dx.doi.org/10.51594/farj.v6i3.971>
- Oyeniyi, L. D., Ugochukwu, C. E. & Mhlongo, N. Z. (2024). Implementing AI in banking customer service: A review of current trends and future applications. *International Journal of*

- Science and Research Archive*, 2024, 11(02), 1492-1509. <https://doi.org/10.30574/ijsra.2024.11.2.0639>
- Oyetunji, D. J. (2024). The role of artificial intelligence and machine learning in enhancing customer experience in Nigeria digital banks. *International Journal of Advance Research, Ideas and Innovations in Technology*, 10(1), 377-382. https://www.researchgate.net/publication/384046632_The_role_of_artificial_intelligence_and_machine_learning_in_enhancing_customer_experience_in_Nigeria_digital_banks
- Rahman, S. M., Yii, K. J., Masli, E. K., & Voon, M. L. (2024). The blockchain in the banking industry: a systematic review and bibliometric analysis. *Cogent Business & Management*, 11 (1). 1-24. <https://doi.org/10.1080/23311975.2024.2407681>
- Ranjan, R. (2024). The evolution of digital banking: Impacts on traditional financial institutions. *International Journal of Progressive Research in Engineering Management and Science*, 4 (9), 753-763. https://www.researchgate.net/publication/388081587_THE_EVOLUTION_OF_DIGITAL_BANKING_IMPACTS_ON_TRADITIONAL_FINANCIAL_INSTITUTIONS
- Rogers, E. M. (1962). *Diffusion of innovations*. Free Press.
- Schumpeter, J. A. (1934). *The theory of economic development*. Harvard University Press.
- Setiawan, R., & Prakoso, L. (2024) Digital banking adoption, bank size, and bank performance in Indonesia. *Jurnal Ekonomi dan Bisnis Airlangga*, 34(2), 196-207. <http://dx.doi.org/10.20473/jeba.V34I22024.196-207>
- Shikha, -, & Singh, P. (2024). Digital banking: Its role, impact & challenges. *International Journal of Research in Finance and Management*, 7(1): 579-584. <https://doi.org/10.33545/26175754.2024.v7.i1f.365>
- Shkurdoda, A.. & Puczyk, A. (2025). *Digital transformation in the banking industry: revolutionizing financial services*. <https://neontri.com/blog/digital-banking-transformation/>
- Ubah, J. C., Adigwe, P. K., Okaro, C. S., & John, N. O. (2023). Effect of digital banking on financial inclusion in Nigeria (2010-2021). *African Banking and Finance Review Journal*, 2(2), 256–272. Retrieved from <https://www.abfrjournal.com/index.php/abfr/article/view/25>
- Udobi-Owoloja, P. I., Akhigbe, B. E., Ubi, A. E., Gbajumo-Sheriff, M. A., & Umoru, B. (2020). Digital banking and bank profitability in Nigeria. *Nigerian Journal of Management Studies*, 20(2), 24-34. https://www.researchgate.net/publication/355984839_DIGITAL_BANKING_AND_BANK_PROFITABILITY_IN_NIGERIA