IMPACT OF FINANCIAL INNOVATION ON BANKING PERFORMANCE IN NIGERIA: ARDL APPROACH

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ABSTRACT

This study examines the impact of financial innovation on the performance of Nigerian deposit money banks over the period from 2012Q1 to 2022Q4, focusing on key financial service channels: Automated Teller Machines (ATM), Point of Sale (POS), Web-based electronic banking (WEB), Mobile Money Operations (MMO), National Electronic Funds Transfer (NEFT), alongside traditional banking performance. The Autoregressive Distributed Lag (ARDL) model, and cointegration analysis confirms a long-run equilibrium relationship among the variables. The ARDL results demonstrate that ATM and web-based banking positively and significantly enhance banking performance in both the short and long run, with web banking exhibiting a notably strong effect. In contrast, Mobile Money Operations and National Electronic Funds Transfer show significant negative impacts, likely due to operational inefficiencies, while POS transactions remain statistically insignificant across both periods. These findings partly align with existing literature, reflecting the heterogeneous effects of financial innovations in Nigeria's banking sector. Robustness checks, including diagnostic and stability tests, validate the model's reliability for forecasting and policy formulation. The study concludes that optimizing digital financial services requires targeted policy interventions to improve the efficiency of Mobile Money and fund transfer platforms and to strengthen web-based banking through enhanced cybersecurity and digital literacy. Based on the conclusion the following recommendations were made; Improve Mobile Money and NEFT platforms by upgrading infrastructure and enhancing user experience to address inefficiencies. Strengthen web-based banking through better cybersecurity, user-friendly design, and increased digital literacy to boost adoption and performance

Keywords: *ARDL, Banking Performance, Financial Innovation*

JEL Classification: *E58, G21, O33*

1. Introduction

In the global financial ecosystem, innovation continues to redefine banking operations by enhancing efficiency, reducing costs, and improving customer experience. Technologies such as internet banking, mobile payments, blockchain, and artificial intelligence have transformed how banks operate and manage risk. Sadik and Rahman (2024), found that while

such innovations lower transaction costs and increase access to financial services, they also introduce vulnerabilities U.S. banks highly exposed to innovation reported operational losses of about USD 142,000 per USD 1 billion in assets quarterly Nevertheless, the overall benefits are clear: a 2025 report by QED and BCG indicates a 21% year-on-year revenue growth among global fintech firms, with 69% of publicly listed companies achieving profitability a significant jump from under 50% in previous years, underscoring the transformative potential of financial innovation.

Within the West African sub-region, digital financial tools like mobile money, POS systems, and agency banking are accelerating financial inclusion and enhancing banking sector performance. Anane and Nie (2022) study on Ghana (2012–2017) found that mobile-money usage raised household consumption by approximately 24%, demonstrating its socio-economic impact across nations like Senegal and Côte d'Ivoire, banks leveraging electronic channels report increased liquidity, reduced costs, and broader outreach. However, the magnitude of these effects is shaped by factors such as digital infrastructure, regulatory frameworks, and financial literacy. This regional pattern aligns with global trends but highlights how local contexts influence the effectiveness of financial innovation.

Nigeria Africa's fintech hub provides a compelling case study for these global and regional dynamics. Over the past two decades, wide adoption of ATMs, POS terminals, mobile and internet banking, and agent banking has significantly shifted the landscape of deposit money banks (DMBs). Research by Gbanador et al. (2022), using ARDL on 2009–2021 data, showed that POS adoption significantly improved bank profitability, with internet banking having a smaller but meaningful positive effect. Okeke and Ezeala (2023) found that POS usage significantly enhanced liquidity ratios, while ATM and mobile banking effects were mixed or insignificant. Additionally, a comprehensive study covering 2012–2021 showed that POS, ATM, mobile, internet, and agent banking collectively had significant short- and long-run impacts on bank performance, with POS having the greatest effect The objective of this study, therefore, is to investigate the differential impact of financial innovation channels on the performance of deposit money banks in Nigeria. The paper is organized into five sections: Introduction, Literature Review, Methodology, Results and Discussion, and Conclusion and Recommendations.

2. Empirical Literature

Financial Innovation

Financial innovation broadly refers to the introduction of new financial instruments, technologies, or delivery mechanisms that improve financial intermediation, reduce transaction costs, and enhance customer access and service efficiency. In the Nigerian banking sector, this concept encompasses a range of technologies including automated teller machines (ATMs), point-of-sale (POS) terminals, internet banking, mobile banking, and fintech-driven agency banking. These innovations have restructured traditional banking operations and significantly altered cost, income, and risk dynamics. For instance, Gbanador *et al.* (2022) showed that POS adoption significantly boosted profitability among Nigerian deposit money banks between 2009 and 2021, while internet banking had a moderate but statistically significant effect. Similarly, Okeke and Ezeala (2023) found that POS and mobile banking channels positively influenced liquidity ratios, although other tools such as ATMs and internet banking demonstrated less consistent results. These findings underscore that financial innovation is not a monolith but a multidimensional concept with varying performance implications depending on the channel of deployment and contextual banking environment.

Banking Performance

Banking performance refers to the overall financial health and efficiency of banks, often measured through indicators such as return on assets (ROA), return on equity (ROE), liquidity ratios, net interest margin, and asset quality. These metrics reflect a bank's ability to generate profit, manage operational costs, and sustain customer confidence. In Nigeria, banking performance has been closely linked to the adoption of financial innovation tools. For example, Osakwe and Akunna (2023) demonstrated that mobile and internet banking had a positive and statistically significant impact on deposit growth and ROA among selected Nigerian commercial banks. Likewise, Madugba *et al.* (2021) found that the deployment of digital banking services significantly enhanced profitability metrics such as ROE and net interest income. These outcomes support the notion that effective integration of innovative financial technologies can drive not just efficiency but also profitability and resilience in the banking sector, particularly in environments where customer reach and service scalability are crucial.

Channels of Financial Innovation

The channels of financial innovation refer to the specific technological tools and platforms through which innovation is delivered in the banking sector. In Nigeria, the primary channels include ATMs, POS terminals,

internet banking, mobile banking, and agent banking. Each of these tools presents distinct operational costs, adoption challenges, and performance outcomes. For instance, Joshi, (2019), found that the combined effect of POS, ATM, mobile, and internet banking explained approximately 83% of the variation in banks' return on equity, with POS having the most significant impact. Conversely, Okeke and Ezeala (2023) noted that while POS and mobile banking positively influenced liquidity and deposit growth, ATM services often had neutral or even negative impacts due to high operational and maintenance costs. These findings suggest that the effectiveness of financial innovation is not uniform across all channels, making it essential for banks to assess the cost-benefit trade-offs of each technology as they pursue digital transformation strategies.

Theoretical Literature

The integration of three foundational theories: Diffusion of Innovation Theory (Rogers, 1962), Technology Acceptance Model (TAM) by Davis (1989), and the Resource-Based View (RBV) by Barney (1991) provides a comprehensive theoretical framework for examining the impact of financial innovation on banking performance in Nigeria. Everett Rogers' Diffusion of Innovation Theory explains how financial technologies such as POS systems, internet banking, and mobile platforms are adopted over time within the banking industry and among consumers, affecting service coverage and competitiveness. Fred Davis' Technology Acceptance Model posits that the adoption of such innovations is largely driven by perceived usefulness and ease of use key factors in determining their impact on customer engagement and institutional efficiency in Nigerian banks. Jay Barney's *Resource-Based View*, on the other hand, positions financial innovation as a strategic resource that can provide sustainable competitive advantage if it is valuable, rare, inimitable, and non-substitutable. Empirical evidence from Nigeria (Gbanador *et al.*, 2022; Okeke & Ezeala, 2023) supports these theories, indicating that banks that effectively deploy and manage financial innovations often achieve superior profitability, liquidity, and operational performance. Collectively, these theories offer a multidimensional understanding of how and why financial innovation influences banking performance in Nigeria.

Theoretical framework

The Resource-Based View (RBV) by Barney (1991) provides a solid theoretical framework for this study on the impact of financial innovation on banking performance in Nigeria. RBV asserts that firms achieve sustainable competitive advantage through the strategic acquisition and deployment of internal resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In the Nigerian banking sector, financial innovations such as mobile banking, POS systems, internet banking, and agent banking can be viewed as

strategic resources that, when effectively integrated, enhance a bank's operational efficiency, customer reach, profitability, and overall performance. Empirical evidence from Nigerian studies (Gbanador *et al.*, 2022; Okeke & Ezeala, 2023) confirms that banks leveraging these innovations experience improved liquidity ratios, higher returns on equity, and stronger competitive positioning. Thus, RBV offers a compelling lens for evaluating how financial innovation serves not just as a technological trend but as a core internal capability that drives superior banking performance in Nigeria.

Empirical Literature

Financial innovation, particularly through POS channels, plays a significant role in enhancing the performance of Nigerian deposit money banks (DMBs). Okeke and Ezeala (2023) found that POS usage significantly improved banks' liquidity, while ATM and mobile banking had no substantial effect. Similarly, Raymond et al. (2022) reported that POS positively influenced Net Interest Margin (NIM), whereas mobile and internet banking had negative impacts. Nwakoby et al. (2020) observed that mobile banking positively influenced Return on Equity (ROE), although ATM and POS effects were statistically weaker. Ogbobe and Ezeala (2023) showed that ATM, POS, and mobile banking all significantly boosted ROE and Earnings per Share (EPS), highlighting the cumulative benefits of digital banking tools. Finally, Azolibe *et al*. (2023) confirmed that ATM and POS transactions had significant effects on total bank deposits, while mobile and internet banking remained insignificant, likely due to low user adoption. Together, these studies underscore the heterogeneity in the effectiveness of financial innovation tools, with POS emerging as the most consistently impactful channel, while ATM, mobile, and internet services produce mixed results depending on infrastructure, user base, and operational.

Gap in Literature

The existing empirical literature highlights several gaps in understanding the impact of financial innovation on banking performance in Nigeria. While Okeke and Ezeala (2023), Ogbobe and Ezeala (2023), and Azolibe *et al.* (2023) consistently find that POS usage significantly enhances bank performance indicators such as liquidity, ROE, and total deposits, the results for ATM, mobile, and internet banking remain mixed and inconclusive. For instance, Nwakoby *et al.* (2020) observed a positive effect of mobile banking on ROE, but ATM and POS had weaker or statistically insignificant effects.

3. Methodology

This study adopts a quantitative, ex-post facto research design to examine the impact of financial innovation on the performance of Deposit Money Banks (DMBs) in Nigeria. It utilizes secondary data obtained from the Central Bank of Nigeria (CBN), the Nigerian Inter-Bank Settlement System (NIBSS), and the published

financial statements of selected DMBs. The scope of the study covers the period from 2012Q1 to 2022Q4, providing a decade-long assessment of financial innovation trends and their implications on banking sector outcomes. Data will be analyzed using both quarterly and monthly frequencies, consistent with the disaggregated data approach applied by Adesete *et al.* (2021). The dependent variable, banking performance (BP), proxied by Return on Assets (ROA), The independent variables, representing key financial innovation tools, include Automated Teller Machine (ATM) transactions, Point of Sale (POS) transactions, National Electronic Fund Transfer (NEFT) volumes, Web Electronic Banking (WEB) activities, and Mobile Money (MMO) transaction values. This methodological framework enables a comprehensive, innovation-specific evaluation of the relationship between digital financial tools and the operational performance of Nigerian DMBs over the selected timeframe. This study utilized the Autoregressive Distributed Lag (ARDL) model developed by Pesaran, Shin and Smith (2001).

The functional form of the model is specified as;

$$BP = f(ATM, POS, WEB, MMO, NEFT) \tag{3.1}$$

Equation 3.1 is transformed into an econometric model as;

$$BP = \beta_0 + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 WEB_t + \beta_4 MMO_t + \beta_5 NEFT_t + \varepsilon_t \tag{3.2}$$

Transformed 3.15 to the ARDL specification as;

$$\begin{aligned}\Delta lnBP_t = {} & \theta_0 + \theta_1 lnBP_{t-1} + \alpha_1 lnATM_{t-1} + \alpha_2 lnPOS_{t-1} + \alpha_3 lnWEB_{t-1} + \alpha_4 lnMM0_{t-1} + \alpha_5 lnNEFT_{t-1} \\ & + \sum_{i=1}^{b} \beta_1 \, \Delta lnBP_{t-1} + \sum_{i=1}^{b} \beta_2 \, \Delta lnATM_{t-1} + \sum_{i=1}^{b} \beta_3 \, \Delta lnPOS_{t-1} + \sum_{i=1}^{b} \beta_4 \, \Delta lnWEB_{t-1} \\ & + \sum_{i=1}^{b} \beta_5 \, \Delta lnMMO_{t-1} + \sum_{i=1}^{b} \beta_6 \, \Delta lnNEFT_{t-1} + \varepsilon_t \end{aligned} \tag{3.3}$$

The first part of the equation, without Δ, indicates long-run dynamics, while the second part, with Δ, represents short-run dynamics. The bounds testing approach is utilized to establish cointegration among the variables before estimating the equation. To estimate the short-run adjustment to equilibrium, the Error Correction Model (ECM) is specified in Equation 3.17 as follows:

$$\Delta \ln BP_t = \theta_0 + \sum_{i=1}^{b} \beta_1 \Delta \ln BP_{t-1} + \sum_{i=1}^{b} \beta_2 \Delta \ln ATM_{t-1} + \sum_{i=1}^{b} \beta_3 \Delta \ln POS_{t-1} + \sum_{i=1}^{b} \beta_4 \Delta \ln WEB_{t-1} + \sum_{i=1}^{b} \beta_5 \Delta \ln MMO_{t-1} + \sum_{i=1}^{b} \beta_6 \Delta \ln NEFT_{t-1} + \delta ECM_{t-1} + \varepsilon_t \quad (3.4)$$

Where δ represents the speed of adjustment of the parameters toward long-run equilibrium following a shock to the system, and $ECMt-1$ is the error correction term.

Where; banking performance (BP) proxy by return on assets; Automated Teller Machines (ATM), Point of Sales (POS); Web banking transaction (WEB); Mobile Banking Operation (MMO); Electronic Fund Transfer (NEFT); β_0 Intercept Coefficient β_1 to β_6 Parameters to be estimated ε Error term. 0 is set equally for all firms in the common constant form. It means that there are no differences between the banks under analysis and that the data set is a priori uniform.

A-priori expectations: $\sum_{i=1}^{\rho} \beta_1$, $\beta_2, \beta_3, > 0$; $\sum_{i=1}^{\rho} \beta_4$, $\beta_5, <0$.

Positive Relationship: Since all the coefficients $\beta_1, \beta_2, \beta_3, > 0$ are positive, each independent variable (ATM, POS, WEB) has a positive impact on the dependent variable BP, while (MMO, NEFT) are negative impact on BP as stated as $\beta_4, \beta_5, <0$. In other words, an increase in any of these independent variables will lead to an increase in BP and decrease respectively.

4. Results and Discussion

4.1. Descriptive Statistics Result

Table 1: Descriptive Statistics

	BP	ATM	POS	WEB	MMO	NEFT
Mean	5.180909	31.18262	29.59886	29.03012	29.88756	32.42163
Median	2.140000	29.50476	28.66289	26.89317	29.25652	30.85516
Maximum	20.93000	35.72198	35.95064	38.90017	36.94682	38.40448
Minimum	1.330000	28.31664	24.60404	24.17539	24.17355	30.20265
Std. Dev.	7.036509	2.837588	3.845017	4.681022	4.122531	2.627185
Skewness	1.654426	0.569911	0.464537	0.725922	0.405596	0.983328
Kurtosis	3.784024	1.517273	1.753859	2.367333	1.919688	2.918069
Jarque-Bera	21.19920	6.412399	4.429419	4.598215	3.346026	7.103162
Probability	0.000025	0.040510	0.109185	0.100348	0.187681	0.028679
Sum	227.9600	1372.035	1302.350	1277.325	1315.053	1426.552
Sum Sq. Dev.	2129.036	346.2319	635.7187	942.2144	730.7961	296.7903
Observations	44	44	44	44	44	44

Source: Author computation (2025)

As presented in Table 1 the descriptive statistics reveal varying levels of usage across the six financial service channels. Banking performance (BP) shows the lowest mean (5.18) and median (2.14), with a wide range and strong right skew, indicating that most observations are low with a few high outliers. In contrast, ATM, POS, WEB, MMO, and NEFT all demonstrate significantly higher average usage, with NEFT having the highest mean (32.42) and the narrowest range, suggesting consistent and widespread adoption. ATM and MMO also show stable patterns with means and medians close together, indicating balanced distributions. POS and WEB exhibit more variability and mild right skewness, reflecting occasional spikes in usage. Overall, electronic and digital channels (NEFT, ATM, & MMO) are more consistently and heavily used, while traditional banking performance metrics remain low and unevenly distributed.

Table 2: Unit Root Test Results

	ADF			PP		
Variables	**Level**	**1st Diff.**	**Status**	**Level**	**1st Diff.**	**Status**
BP	-2.6013**	-2.6657*	I(0)	-2.7482***	-6.5456***	I(0)
ATM	-0.8579	-6.0941***	I(1)	-1.2814	-6.4418***	I(1)
POS	-0.8897	-5.7190***	I(1)	-1.0542	-6.5417***	I(1)
WEB	-0.3081	-6.6470***	I(1)	-0.2367	-6.6641***	I(1)
MMO	-0.7878	-6.6791***	I(1)	-0.7467	-6.6978***	I(1)
NEFT	-0.7546	-6.4898***	I(1)	-0.7750	-6.4898***	I(1)

Note: *(*) significance at 10%, (**) significance at 5% and (***) significance at 1% respectively*
Source: Author computation (2025)

The results reported in Table 2 indicate that both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were conducted to examine the stationarity of the data series. Since the bounds test requires that variables be either integrated at I(0), I(1), or a combination of both, checking for stationarity is essential to ensure unbiased estimation. The findings reveal that Automated Teller Machine transactions, Point of Sale transactions, Web Electronic Banking transactions, Mobile Money transactions, and National Electronic Fund Transfer transactions are all stationary at first difference I(1), while Banking Performance is stationary at level I(0) in both the ADF and PP tests. Given these stationarity properties, the appropriate estimation technique for this study is the Autoregressive Distributed Lag (ARDL) model.

Table 3: Bound F-Test Cointegration

Test Statistics	**Value**	**K**
F-Statistic	11.28080	6
	Critical Value Bounds	
Significance	**1(0) Bound**	**1(1) Bound**
10%	1.99	2.94
5%	2.27	3.28
1%	2.88	3.99

Source: Author computation (2025)

The empirical results of the bound test, presented in Table 4 for cointegration, assess whether a long-term equilibrium relationship exists between the variables being analyzed. The calculated F-statistic is 11.28080, which is compared against the critical value bounds at various significance levels (10%, 5%, and 1%). Since the F-statistic (11.28080) exceeds the upper critical value bound at all significance levels, there is strong evidence of cointegration between Banking Performance, Automated Teller Machine transactions, Point of Sale transactions, Web Electronic Banking transactions, Mobile Money transactions, and National Electronic Fund Transfer transactions. This finding confirms the presence of a long-term equilibrium relationship among the analyzed variables.

Table 4: Result of Estimated Long-run and Short-run results for ARDL

ARDL Model (1, 0, 0, 0, 0, 0, 1) based on AIC
Dependent Variable: Banking Performance (BP)

PANEL A (Long-run)	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
	LATM	3.891248	2.066987	1.882570	0.0683*
	LPOS	7.499928	5.181147	1.447542	0.1569
	LWEB	5.456755	1.709878	3.191313	0.0030**
	LMMO	-12.035375	4.820971	-2.496463	0.0176**
	LNEFT	-7.109705	1.681184	-4.228986	0.0002***
	C	73.413013	32.849094	2.234857	0.0321**
PANEL B (Short-run)	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
	D(LATM)	3.202603	1.501611	2.132778	0.0402**
	D(LPOS)	3.389640	2.926757	1.158156	0.2549
	D(LWEB)	3.262583	1.067488	3.056319	0.0043**
	D(LMMO)	-6.450407	2.703470	-2.385973	0.0227**
	D(LNEFT)	-4.843873	1.214115	-3.989634	0.0003***
	CointEq(-1)	-0.358252	0.117785	-3.041567	0.0045**

Note: *(*) significance at 10%, (**) significance at 5% and (***) significance at 1% respectively*
Source: Author computation (2025)

As presented in Table 4 the Autoregressive Distributed Lag (ARDL) model presents both long-run and short-run dynamics of the relationship between financial innovation tools and banking performance in Nigeria. In the long run, the usage of Automated Teller Machines shows a positive but marginally significant effect on banking performance, suggesting a weak but favorable contribution over time. Point of Sale transactions also have a positive coefficient, but the impact is statistically insignificant, indicating no strong evidence of long-term influence. On the other hand, web-based electronic banking demonstrates a significant and positive long-run effect, highlighting its growing importance in enhancing banking performance. Conversely, Mobile Money Operations and the National Electronic Funds Transfer exhibit significant negative long-run impacts, implying that higher usage of these channels may be associated with operational inefficiencies or customer dissatisfaction that undermines banking performance. The significant constant term supports the presence of a stable baseline level of performance regardless of these innovations.

In the short-run analysis, the results show that Automated Teller Machines and web-based banking continue to positively and significantly impact banking performance, suggesting their quick responsiveness in supporting banking operations. Mobile Money Operations again exhibit a negative and significant short-run effect, consistent with the long-run outcome and reinforcing concerns over its operational drawbacks or challenges in customer experience. National Electronic Funds Transfer also continues to show a significant short-run negative effect, indicating persistent issues with this payment channel. However, Point of Sale transactions remain statistically insignificant in the short run, mirroring their long-run behavior. The error correction term is negative and significant, indicating a stable adjustment toward long-run equilibrium, with deviations correcting at a speed of approximately 36 percent per quarterly.

Similarly, the existing empirical studies, the findings of this analysis present a mix of alignments and contradictions. The insignificant impact of Point of Sale transactions aligns with the results of Azolibe *et al.* (2023), who found minimal influence on banking performance, likely due to limited adoption or transaction volume. However, it contrasts with studies by Okeke and Ezeala (2023), which reported significant positive impacts of Point of Sale usage on bank liquidity and Net Interest Margin, respectively. The positive impact of web-based banking in this study contradicts earlier findings by Raymond et al., who observed negative effects. The negative influence of Mobile Money Operations opposes the findings of Nwakoby *et al.* (2020) and Ogbobe and Ezeala (2023), who reported positive outcomes on Return on Equity and Earnings per Share. Meanwhile, the positive effects of Automated Teller Machine usage in this study support the findings of Ogbobe and Ezeala but challenge others who reported no substantial impact. This study underscores the

heterogeneous and context-specific impacts of financial innovation on the performance of Nigerian deposit money banks, where web-based platforms and Automated Teller Machines prove most beneficial, while Mobile Money Operations and National Electronic Funds Transfer may require policy and operational reassessment.

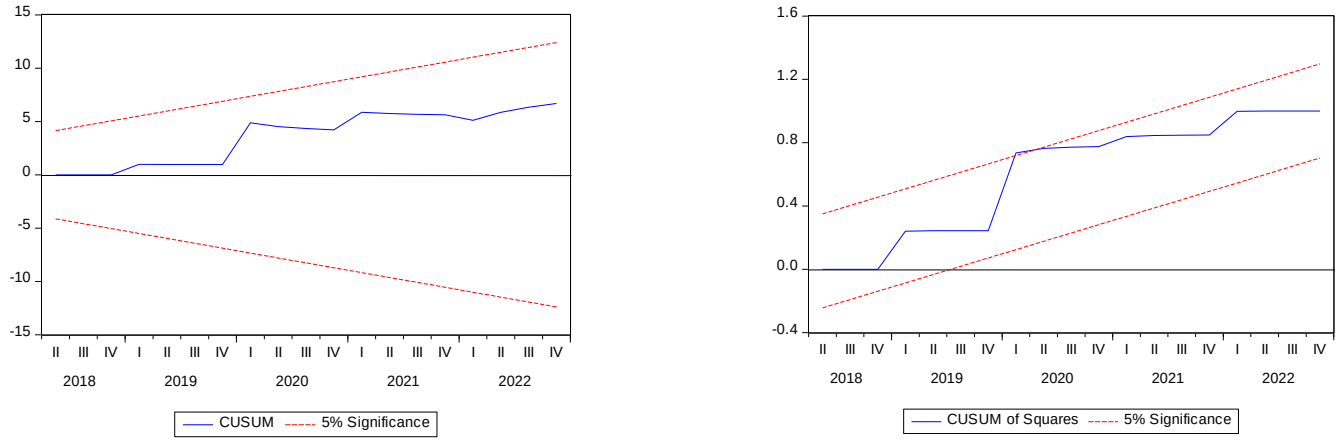
Table 5: Post-estimated Diagnostic Test of ARDL Results

Test	Coefficient/Jargu-Bera	P-Value
Serial Correlation LM Test	0.668720	0.5194
Ramsey Reset Test	1.255618	0.2173
Residual Heteroskedasticity Test	0.428635	0.5164
Jargu-Bera Residual Normality Test	4.232031	0.1205

Source: Author Computation (2024)

The results in table 5 shows there is no evidence for post-estimated diagnostic test problem in the model. The serial correlation langrange multiplier test indicates the evidence of no serial correlation with the coefficient of 0.668720 with P-value of 0.5194. The Ramsey test indicates the coefficient value of 1.255618 with P-value of 0.2173 for the functional specification shows that there is no evidence of misspecification of model. The Breusch-Pagan-Godfrey Test for heteroskedasticity test shows that the disturbance term in the model is homoscedastic with the coefficient of 0.428635 with P-value of 0.120511 and thus, the ARDL model is correctly specified given all the P-value are greater than 5% level of significance.

Figure 1: *Cumulative Sum of Recursive Residuals of Cusum and Cusum of Square (ARDL)*



Source: Author Computation (2025)

As shown in Figure 1, the stability result for the Model reveals that the coefficients and relationships observed in the model are consistent and can be used for forecasting and policy analysis. It is important for policymakers and researchers to consider the stability of the model when interpreting and relying on the results

5. Conclusion and Recommendations

In conclusion the analysis reveals that digital financial innovations impact banking performance in Nigeria in varied ways. Automated Teller Machines and Web-based banking significantly enhance performance, particularly in the long run, while Mobile Money Operations and National Electronic Funds Transfer show consistent negative effects, indicating possible operational inefficiencies. Point of Sale transactions, despite their popularity, show no statistically significant influence in either the short or long run. These findings align with Azolibe et al. (2023), who reported minimal impact of Point of Sale usage, but contradict Okeke and Ezeala (2023) and Raymond et al. (2022), who found positive effects on bank liquidity and Net Interest Margin. Similarly, the negative influence of Mobile Money Operations contrasts with the positive impacts on Return on Equity and Earnings per Share reported by Nwakoby et al. (2020) and Ogbobe and Ezeala (2023). Diagnostic and stability tests confirm the ARDL model's robustness and reliability for forecasting. Overall, the study underscores the need for policymakers to enhance the efficiency of Mobile Money and fund transfer services and reconsider strategies for maximizing the benefits of Point of Sale systems. Based on the conclusion the following recommendations were made; Improve Mobile Money and NEFT platforms by upgrading infrastructure and enhancing user experience to address inefficiencies. Strengthen web-based banking through better cybersecurity, user-friendly design, and increased digital literacy to boost adoption and performance.

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