

CASHLESS POLICY AND FINANCIAL SOUNDNESS OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

Cashless policy was introduced to modernize the payment system, reduce the cost of cash handling, curb illicit financial flows and drive financial inclusion. The study examined Central Bank of Nigeria's Cashless Policy and soundness of deposit money banks in Nigeria. Specifically, the study assessed the impact of automated teller machine transactions on the capital adequacy ratio of deposit money banks in Nigeria. Evaluate the impact of point of sale transactions on the capital adequacy ratio of deposit money Banks in Nigeria and determine the impact of Internet Banking transactions on the capital adequacy ratio of deposit money banks in Nigeria. The study employed an ex-post facto research design. The population of this study consists of all deposit money banks operating in Nigeria. The study employed the Generalized Linear Model (GLM) as the prime analytical technique. The results indicate that automated teller machine transactions has positive and significant effect on capital adequacy, Point of sale transactions show strong and consistently negative effect on capital adequacy. Internet banking transactions exhibit a positive and statistically significant influence on capital adequacy. Mobile banking transactions has the most substantial and statistically significant positive effect on capital adequacy. The study concludes that digital banking channels significantly influence the capital strength of deposit money banks in Nigeria. Among the recommendations is that banks should continue to invest in automated teller machine transactions infrastructure, enhance accessibility, and improve system reliability to sustain their positive effect on capital adequacy. Banks should evaluate the cost-efficiency of point of sale operations, strengthen fraud prevention mechanisms, and implement monitoring frameworks to mitigate their negative impact on capital adequacy. Banks should improve the security and functionality of internet banking platforms and promote customer awareness to increase usage and maintain their positive contribution to capital strength. Banks should prioritize the expansion of mobile banking services, optimize mobile app performance, and integrate innovative financial solutions to reinforce its strong positive influence on bank soundness.

Key Words: cashless policy, financial soundness, deposit money banks, Nigeria

Introduction

Globally, the banking industry remains a cornerstone of economic growth and financial system development, serving as a vital channel for capital mobilization, credit allocation, and financial intermediation. In recent years, the rapid advancement of Information and Communication Technology (ICT) has transformed the operations of banks, enabling faster, more secure, and more accessible financial services. In the Nigerian context, digital transformation in banking has become increasingly relevant with the adoption of Automated Teller Machines (ATM), Point of Sale (POS) terminals, mobile banking, and internet platforms as key channels for enhancing service delivery and competitiveness. Beyond profitability and returns, these modernisms have also influenced overall bank reliability,

particularly through enrichment in the Capital Adequacy Ratio (CAR)—a key measure of a bank's skill to absorb risk and save from harming depositors.

According to Yusuf Olofin, Ibrahim Yadua, Abdulazeez Gambo, and Sulaiman Muhammad (2024), the deployment of digital technologies has significantly reshaped the performance indicators of listed commercial bank. Specifically, their findings revealed a positive and significant relationship between POS usage and fiscal recital, affirming the strategic value of electronic banking innovations. This technological shift is in line with the objectives of the cashless policy introduced by the Central Bank of Nigeria (CBN) in March 2012, aimed at minimizing the circulation of physical cash and sponsor a more efficient, digital-based financial ecosystem.

The CBN's cashless policy was designed to reduce the costs associated with cash handling, improve payment efficiency, combat corruption and money laundering, and promote financial inclusion by extending banking services through electronic channels. The initiative initially began in Lagos, given its high transaction volumes, and was later complete nationwide. As emphasized by Mohammed Ibekwe (2021), the policy's impact has been notable in terms of improved bank profitability, particularly through increased adoption of mobile banking and POS systems. These innovations not only enhance customer access but also lesser overhead transaction costs and drive return on assets.

Further supporting these findings, Ibrahim Akwam and Gideon Yua (2021) reported a strong and significant relationship between mobile and POS transactions and key bank performance metrics such as Return on Assets (ROA) and Return on Equity (ROE). This suggests that digital financial products are more than just prepared upgrades—they are essential levers for profitability, strategic outreach, and financial resilience. Esther Onuorah, Promise Oboro, and Benson Ofanson (2022) also highlighted that fintech adoption, under the cashless framework, has improved profitability by increasing transaction volume and reducing manual inefficiencies across Nigerian banks.

From a broader perspective, international experiences also underscore the value of cashless policies and digital banking. In Indonesia, Lilis Medyawati, Fendy Yunanto, and Anita Hegarini (2021) found that mobile and internet banking notably enhanced the profitability of commercial banks, reflecting similar gains seen in Nigeria. Likewise, in Malaysia, Haider Al-Naimi, Mohammed Yaseen, Eyad Alnaimat, Farah Abed, and Muhammad Farooq (2024) observed that the use of mobile banking apps led to improved capital adequacy and liquidity, though the direct effects on profitability were mixed. Meanwhile, Alkhaleel Alghadi (2024), focusing on Islamic banks in Jordan, reported substantial performance gains from digital banking but put emphasis on the necessity of robust infrastructure and institutional readiness to sustain these benefits.

Collectively, these empirical findings indicate that the transition toward a cashless policy in Nigeria and other developing countries has yielded measurable improvements in financial performance, operational efficiency, and patron satisfaction. However, the success and sustainability of this transition depend heavily on adequate ICT infrastructure, widespread digital literacy, regulatory support, and strategic investment by financial society. As Nigeria continues its trajectory toward a digitally driven financial system, banks must remain agile, inclusive, and technologically prepared to maximize the benefits of a cashless economy, while ad infinitum monitoring and strengthening bank soundness through capital adequacy.

Statement of the Problem

The universal financial space has undergone a radical transformation, with banks increasingly adopting electronic means such as Automated Teller Machines (ATM), Point of Sale (POS), Internet Banking, and Mobile Banking to enhance operational efficiency, broaden financial involvement, and comply with evolving regulatory frameworks. In Nigeria, the implementation of the Central Bank's cashless policy since 2012 has accelerated the deepening of these non-traditional banking platforms, aiming to modernize the financial organism and reduce the dependence on cash-based transactions.

While the adoption of these channels has shown promising trends, empirical evidence on their impact remains fragmented and inconclusive—particularly regarding their influence on the financial soundness of commercial banks, as captured by the Capital Adequacy Ratio (CAR). For instance, Yusuf Olofin et al. (2024) observed a constructive and significant relationship between POS usage and financial recital in Nigeria, while Mohammed Ibekwe (2021) reported that mobile banking significantly improved profitability, though POS had mixed outcomes. Similarly, Akwam and Yua (2021) found strong correlations among mobile and point of sales transactions and bank profitability (ROA and ROE), but did not extend their analysis to capital adequacy or risk exposure.

Other local studies, such as that of Onuorah, Oboro, and Ofanson (2022), highlighted that fintech adoption enhanced efficiency and profitability through increased transaction volumes. However, these studies primarily emphasized effectiveness metrics, with limited focus on financial soundness indicators like CAR. International perspectives offer a more varied picture: Medyawati et al. (2021) in Indonesia and Al-Naimi et al. (2024) in Malaysia discovered that while mobile and internet banking improved profitability and capital adequacy, the impact was highly dependent on institutional infrastructure and digital readiness. Alghadi (2024), in his study on Islamic banks in Jordan, further emphasized that the sustainability of digital banking outcomes hinges on regulatory preparedness and universal resilience.

Despite these contributions, a major gap persists in understanding how these cash policy variables affect the broader financial soundness of banks, particularly CAR, within the Nigerian context since most of the empirical studies stated above either focus narrowly on profitability (ROA and ROE). This limits policy and managerial decisions, especially at a time when bank capital buffers and systemic resilience are ever more under regulatory scrutiny. Consequently, this study seeks to fill this empirical and methodological gap by comprehensively assessing the effects of ATM, POS, Internet, and Mobile banking transactions on fiscal soundness (CAR) of DMBs in Nigeria from 2012Q1 to 2023Q4.

Literature Review

Theoretical Review

Innovation Diffusion Theory

Rogers (1962) proposed the theory of innovation diffusion. According to the theory, any institution seeking to grow must be willing to experiment. The theory posits that there are five key characteristics of innovations: improvement of existing modes of operation, consistent approach to performance, pre-testing capacity, and ease of observing any shortcomings. Institutions can gain a competitive advantage and reduce operational costs through innovation. Furthermore, institutions would be able to go through new markets and find new ways to serve their customers. Innovation diffusion theory is applicable to Deposit funds Banks in Nigeria, as they have already embraced and adopted financial

technology in their system of delivering financial services to their customers. As a result of the adoption the financial performance of Deposit capital Banks has increased. In line with the tenets of the theory, the process of disseminateanmodernism is communicated through communication channels among social system members. The innovation decision process, as described by Rogers 1962, outlines the stages an individual may pass through when considering the adoption of an innovation, the individual forms an attitude toward it upon adoption, the individual implements the innovation and reduces uncertainty through use and experience. Finally, during the confirmation stages the individual continue whether adoption should be sustained or discontinued.

Conceptual Review

Cashless Policy

Money is often said to have three core functions: a unit of account, a medium of exchange, and a store of value. In the context of a cashless policy, the medium-of-exchange and store-of-value functions of physical currency are being gradually replaced by electronic alternatives. A cashless policy does not imply a total elimination of cash transactions but rather a financial ecosystem where electronic transactions rule. According to Ibrahim, Danlami, and Yusuf (2021), a cashless practice aims to reduce the volume of raw cash in circulation by supporting electronic payment systems as a more reliable means of carryout financial transactions.

As noted by Onuorah and Ofanson (2022), the cashless policy in Nigeria was introduced to modernize the payment system, reduce the cost of cash use, curb illicit financial flows, and drive financial inclusion. In support of this, Adesina, Akinlolu, and Olatunde (2023) emphasized that the policy seeks to improve monetary policy effectiveness and encourage digital financial services to reach underserved populations. Although the policy presents opportunity for enhanced financial management, challenges remain, especially in under-banked and rural areas, where electronic infrastructure and literacy are still low. Some critics argue that in developing nations like Nigeria, where large portions of the population remain unbanked, physical cash remains the most accessible means of conducting transactions.

Nonetheless, studies such as Ahmed, Bello, and Sanni (2023) indicate that the cashless policy has positively impacted economic transactions by increasing digital payment adoption and encouraging formal financial participation. Furthermore, Ibrahim and Akwam (2024) observed that the shift to a cashless environment supports the increase of fintech and mobile money solutions that boost both economic inclusion and institutional efficiency. In practice, the growth of a cashless strategy depends on several factors, including the availability of digital infrastructure, the security of electronic payment platforms, and the willingness of stakeholders to adopt new technologies. The implementation of card-based payment systems, mobile banking, point-of-sale terminals, and internet banking are central to the operational framework of the cashless policy in Nigeria. Overall, as the Central Bank of Nigeria continues to advance its digital financial agenda, the cashless policy remains a transformative mechanism for modernizing the financial system, fostering transparency, and promoting all-encompassing economic growth.

Banks' Financial Soundness

Banks' financial soundness refers to the overall financial health, stability, and operational resilience of banking institutions, and it is fundamental to the strength of any economy. A sound banking system is characterized by ample capitalization, strong asset quality, efficient management, consistent earnings, sufficient liquidity, and the skill to take up market shocks. Among these, capital adequacy measured by the Capital Adequacy Ratio (CAR) is for the most part critical as it reflects a bank's ability to withstand financial losses and look after depositors (Hu, Wei & Wang, 2025; Oseni, 2024)

Furthermore, banks that maintain high CAR levels are better positioned to manage credit risk, maintain public confidence, and ensure nonstop service delivery during economic downturns. In the Nigerian context, the Central Bank of Nigeria (CBN) emphasizes bank soundness from beginning to end regulatory tools such as the CAMELS framework and minimum capital thresholds. Moreover, the adoption of digital modernism under the cashless policy such as ATM, POS, internet banking, and mobile platforms has enhanced prepared efficiency, broadened financial access, and contributed to financial inclusion, all of which strengthen bank soundness. However, these gains must be managed alongside potential risks such as cyber threats and structure downtimes. Ultimately, a sound banking sector supports economic growth, ensures pecuniary stability, and provides a safe situation for savings and investment (Oseni, 2024).

Empirical Review

Alghadi (2024) examined the effect of fintech Services upon Islamic banking financial performance around Jordan. The investigation utilized a quantitative-descriptive survey approach. The study utilized annual data (panel data) which were acquired via financial society figures of the annual statements from the Jordan's Islamic Bank (JIB) registered with Amman Stock Exchange from 2017 to 2021. This investigation found Fintech services, such as internet banking, mobile banking, crowd-funding, and automated teller machines had a substantial effect on JIB's financial performance. The positive beta value suggests that there were favorable relationships among JIB's financial success from 2017 to 2021 on Fintech services.

Ibekwe (2021) investigated the effect of pecuniary innovations on the performance of Nigerian banks. Variables considered include: automated teller machine, mobile banking, internet banking, and point of sales on bank performance proxies: return on asset and equity. The study adopted an ex-post facto research design because the data for the study are secondary data which were sourced from Central Bank of Nigeria Statistical Bulletin, CBN Annual Report and Statement of Accounts. The result of the study indicate that robotic teller machine, mobile banking and point of sales have positive and significant effect on return on asset while internet banking has negative and insignificant effect in return on asset. The study thus concludes that fiscal proceed have positive effect on the fertility of commercial banks in Nigeria and have increase the return on asset of the commercial banks in Nigeria. Amongst the recommendation is that government should provide adequate infrastructure in the area of power supply, telecommunications and internet.

Akwam and Yua (2021) examined the effect of e-money harvest on the pecuniary performance of commercial banks in Nigeria. In their analysis, the amount of POS, mobile, and ATM transactions

served as a proxy for financial products, while return on equity, earnings per share, and return on assets served as stand-ins for banks' recital. The study discovered a strong positive correlation between mobile expenses and point-of-sale transactions (POS) on return on assets (ROE) and return on assets (ROA), after analyzing time series annual data from 2005 to 2019. Furthermore, earnings per share were significantly definitely impacted by ATM transactions.

Medyawati, Yunanto and Hegarini (2021) examined the influence of financial technology on financial performance of banks listed on the Indonesian Stock Exchange, and the study spanned from 2014-2020. The number of Automated Teller Machine transactions and internet and mobile banking service were used to capture financial technology, while profitability was measured by return on assets (ROA). The study utilized panel data regression technique, the results showed that internet and mobile banking radically influences bank financial performance, the impact of ATM was found to be of no consequence. Based on the findings, the authors recommended the strengthening of digital banking in order to continue to augment bank profitability.

Nwakoby et al. (2020) investigated the routine of nine specific banks listed on the Nigerian stock exchange in relation to the influence of electronic payments. The study employed Ordinary Least Squares (OLS) regression analysis with ATM, POS, and mobile payment transactions as indicators of electronic banking to calculate revisit on equity as a measure of banks' profitability.

Lasisi and Abubakar (2020) examined the effects of automated teller engine on user satisfaction in Nigeria: A study of combined bank for Africa in Sokoto metropolis: The Nigerian Banking sector over the years has been experiencing noteworthy changes and development in its Information and Communication Technology.

Olushola, Umar, Busari, Ekpe and Kolawole (2020) ascertained the effect of electronic banking on bank recital in Nigeria. The study utilized secondary data derived from the audited annual financial statement of the deposit money banks quoted on the Nigerian Stock Exchange from 2008–2017. The study also made use of journals, textbooks, Nigerian Stock Exchange fact books, the Central Bank of Nigeria Bullions and other available equipment. Using the multiple regression analysis techniques, the findings revealed that e-banking measured by return on equity, return on assets, and earnings per share has no significant impact on the performance of banks in Nigeria. With the findings, we can conclude that investment in electronic banking has not superior the recital of deposit funds banks in Nigeria. The study recommends that for effectiveness

Kipchoge and Mutuku (2024) examined influence of mobile banking on microfinance institutions' financial performance in Kenya. The study utilized an explanatory research design. The target population was 13 microfinance banks operating in Kenya and covered a period of 10 years (2012 to 2021). Since the sample size of the research was small, a census comes up to was employed.

Keywords: Mobile banking, originality, marketable Banks, Profit

Ehiedu, Onuorah and Chiejina (2023) examined the effect of e-payment system (EPS) on the efficiency of banks in Nigeria from the year 2012 to 2016. A linear regression analysis was used via SPSS to carry out the analysis, at a significance level of 0.05. The result of the analysis obtained a P-Value significance of 0.333 which connotes that there is no discernible effect of EPS on the efficiency of banking in Nigeria.

Al-Naimi, Yaseen, Alnaimat, Abed and Farooq (2024) examined the financial performance of publicly listed banks in Malaysia before and after adopting a mobile banking application. The sample comprises

eight banks, covering a period of twelve quarters before and twelve quarters following the implementation of cellular phone banking. The evaluation of financial performance focuses on key dimensions of earnings, capital adequacy, asset quality, and liquidity, which are measured with Return on Equity (ROE), Capital Adequacy Ratio (CAR), Non-Performing Loan (NPL), and Loan to Deposit Ratio (LDR). The Shapiro-Wilk normality test indicates that both ROE and LDR meet the assumption of routine required for the Paired Sample T-test analysis, while CAR and NPL are analysed using the Wilcoxon Signed Rank Test. The findings indicate a significant difference in LDR and CAR before and following the adoption of mobile banking, while no significant difference is observed for ROE and NPL.

Onuorah, Oboro and Ofanson (2022) examined the impact of Fintech operations and banks' profitability using secondary data from 2010 – 2022. The panel least square method was adopted. The outcome indicated that the preface of fintech boosted the profitability of banks in Nigeria. Profitability was experienced through increase in the volume of transactions.

Lasak (2022) carried out a threefold study: 1) to investigate the role of financial technologies in financing SMEs, 2) to examine the role of entities based on financial technology in financing SMEs in developing countries, and 3) to consider other non-bank aspects of financing SMEs, leading to the improvement of the financial state of affairs of these entities. The study employs a theoretical approach drawing on a narrative literature review. The primary attention is focused on applying financial technology as a stimulant for the finance of SMEs in developing countries. The financial technology was found to have a positive effect on bank performance.

Li., Stasinakis and Yeo (2021) focused on the impact of financial technology on the operating efficiency of deposit money banks in Chinese. The study careful efficiency of commercial bank using parametric and non-parametric methods. The study finds that the development of financial technology has a significant role in promote the efficiency of Chinese commercial banks.

Karsh and Abufara (2020) examined the impact of financial technology companies compared to the traditional banking industry. A study model has been designed that identifies the dependent and independent variables for each hypothesis. The research findings indicate that the formation of financial technology companies will grow more rapidly in environments with widespread mobile phone use and access to digital technology.

Okonkwo and Ekwueme (2022) examined the effect of E-payment on the performance of deposit money banks in Nigeria. An ex-post facto research design was utilized in the study. From a population of 22 deposit money banks in Nigeria, a sample of 13 banks was drawn. Data were analyzed with descriptive statistics and the hypotheses falling off analysis was carried out with the aid of E-Views 9.0 statistical software. The study revealed that MPAY payment method has a positive effect on return on assets of quoted deposit funds banks in Nigeria, but not statistically significant at 5% level of significance, and online (WEB) payment methods has a negative effect on return on assets of quoted deposit money banks in Nigeria, and this effect was not statistically significant at 5% level of significance. Based on the findings, the study recommended that Nigerian deposit money banks partners with mobile service providers to detect, prevent, and persecute hackers, thereby minimizing the negative impact of mobile payment systems on banks profitability.

In Kenya, Ong'era and Omagwa (2021) assessed how mobile banking influence commercial banks' financial performance. The researcher emphasized on few particular commercial banks— Equity Bank,

KCB Bank, Co-operative Bank, and Family Bank—in July 2016. The researcher conducted this study in descriptive manner. Mainin sequence was used in the research. A questionnaire was employed to gather primary information. In accordance to the survey, Kenya's 4 commercial banks' monetary performance is partial by mobile banking. The survey also IRJEF ISSN 2710-2742 (online), www.irjp.org Page 15 revealed that mobile banking is reliable for users, helps banks reach the largest group of people of the unbanked folks, is cheap to run and secured, effective, and raises the volume of transactions in commercial banks. However, the researcher utilized primary data obtained using questionnaires. In addition, the researcher focused on Kenyan commercial banks, which differ from Kenyan microfinance banks.

Zinakova (2020) investigated financial technology, its functional mechanisms and impacts on financial performance of banks in Nordic countries. The study employed panel least squares technique, the results found that fiscal technology significantly influences market recital, and has a negative impact on profitability, liquidity, and solvency of banks.

Ghazi and Imen (2020) investigated whether or not there is a mediating effect of risk management on the relationship between financial modernism and bank performance. Data collected from annual activity reports of banks listed on the Tunis Stock Exchange is analyzed, and used to validate the theoretical and empirical charity of our article. The empirical study uses the Panel data extracted from 10 banks, over the period ranging from 2009 to 2017. The study used the specifications of random effects. Our empirical analysis substantiates that fiscalmodernism vis-à-vis ATM, POS, and internet banking transactions have positive effect on stock market performance, and a non-significant impact on financial profitability. Additionally, our results indicates that improving the stock market performance of banks by financial innovation depends on the mediator role of the operational risk management. To remain humanizingconcert, Tunisian banks must pay more attention on special training of bank managers whose purpose relate to the choice of financial innovations and manage the associated risks.

In Kenya, Mugane (2020) assessed whether mobile banking services influences the performance of financial commercial banks. Moreover, the research adopted descriptive design. In this research, all 40 banks for commercial operations in Kenya were the target population under investigation, with two participants from each bank giving a whole of eighty respondents from all 40 Kenyan commercial banks. The best approach in a job was a census inquiry method. Moreover, questionnaire was employed to obtain study's primary data. Results indicated that mobile banking services including message service, bill payments and SMS banking had significant impact on commercial banks' performance.

Ene, Abba, and Fatokun (2019) studied the impact of modern banking on financial inclusion in Nigeria. The total number of point-of-sale devices and robotic teller machines in Nigeria was used as proxies for modern payment option and the proportion of the banked adult population to the total bankable adult population in Nigeria as a proxy for fiscal inclusion. The correlational analysis was adopted in the study. The result of the study disclosed that automated teller machines do not significantly impact financial inclusion while point-of-sale devices significantly impact financial inclusion in Nigeria.

Okonkwo, and Ekwueme (2022) examined the effect of E-payment on the performance of deposit money banks in Nigeria. The study employed Ex post facto research design. A sample size of 13 deposit money banks in Nigeria was used from the populace of 22 banks. Data were analyzed with descriptive statistics and the hypotheses deterioration analysis was carried out with the aid of E-Views 9.0 statistical software. The study revealed that MPAY payment method has a positive effect on return on assets of quoted

deposit change banks in Nigeria, but not statistically significant at 5% level of significance, and online imbursement methods has a negative effect on return on assets of quoted deposit money banks in Nigeria, and this effect was not statistically significant at 5% level of significance.

Morufu (2016) in their study examined the impact of four (ATM, POS, web/Internet and mobile) e-payments adoption and banks specific variables on the profitability of the Nigerian Deposits Money Banks (DMBs). Secondary data were collected from the annual reports and accounts of deposit money banks (DMBs) from 2005 to 2012. The data were analysed using panel logistic regression. The results revealed that the adoption of e-payment system by banks significantly affects their performance, including gross margin, earnings after tax (EAT), return on assets (ROA), and return on equity (ROE). Specifically, there is a positive association between the adoption of e-payment systems and improvements in these performance measures. Furthermore, the adoption of four e-payment instruments – ATM, web banking, POS, and mobile banking – had a notable impact on key performance indicators, including ROA, gross margin and profit after tax (PAT), among the sample banks.

Methodology

Research Design

The study employed an ex-post facto research design. The population of this research consists of all Deposit Money Banks (DMBs) operating in Nigeria as familiar by the Central Bank of Nigeria (CBN) during the period under review. The study adopted Generalized Linear Model (GLM) as the primary diagnostic technique.

Model Specification

Following the review of the theoretical literature and the discourse on channels of financial technology, the functional model for this study is specified as:

$$CAR_{it} = f(ATM_{it}, POS_{it}, INB_{it}, MOT_{it}) \quad (1)$$

Where,

CAR_{it} is the dependent variable, capital adequacy ratio, ATM is Automated Teller Machine service, MOT is mobile banking, POS is Point of Sale terminal services, and INB is internet banking service which are the components of cashless policy; t , is time, the econometric model is presented in equation 2:

$$CAR_{it} = \alpha_0 + \alpha_1 ATM_{it} + \alpha_2 POS_{it} + \alpha_3 INB_{it} + \alpha_4 MOT_{it} + U_{i,t} \quad (2)$$

$\alpha_1 - \alpha_4$ are the parameters to be estimated, and ε is the unobserved error term.

A priori, expectation: $\alpha_1, \alpha_2, \alpha_3, \alpha_4 > 0$. All the explanatory variables that captured innovation in financial technology ATM, POS, INB, and MOT are expected to have a positive effect on financial soundness of DMBs in Nigeria.

Data Analysis

Descriptive Statistics

Table 1 shows the summary characteristics of the individual variables – that is, the mean, maximum, minimum, and standard deviation values.

Table 1. Descriptive Statistics

Statistic	ATM	POS	INB	MOT	CAR (%)
Mean	160,753,027.81	488,997,703.29	845,853,399.78	312,182,208.82	15.19
Median	145,919,885.00	14,370,863.00	14,495,549.00	14,908,409.00	15.15
Maximum	437,759,654.00	2,649,056,326.00	5,747,293,643.00	1,596,241,648.00	19.59
Minimum	371,008.17	212,920.42	189,705.33	191,474.00	10.23
Std. Dev.	123,328,651.14	765,342,520.89	1,496,063,208.64	430,764,273.16	2.14
Skewness	0.656112	2.448000	2.013172	2.617560	-0.252568
Kurtosis	2.433488	7.615064	5.390536	8.734815	2.683813
Jarque-Bera	4.085737	90.53924	43.85223	120.5892	0.710274
Probability	0.129656	0.000000	0.000000	0.000000	0.701077
Sum	7,555,592,307.00	22,493,888,755.00	38,911,254,390.00	14,304,778,006.00	728.07
Sum Sq. Dev.	6.91E+17	2.78E+18	1.06E+19	8.66E+17	215.43
Observations	48	48	48	48	48

Source: Authors' Collation Using Eviews 9 (2025)

The descriptive statistics presented above provide key insights into the distribution and variability of the selected electronic banking channels (ATM, POS, Internet Banking [INB], and Mobile Transactions [MOT]) and the Capital Adequacy Ratio (CAR) in Nigeria from 2012 to 2023. On average, Internet Banking (INB) recorded the highest transaction value with a mean of ₦845.85 billion, followed by POS at ₦488.99 billion, MOT at ₦312.18 billion, and ATM at ₦160.75 billion. CAR, which averaged 15.19%, reflects the capital strength of the banking sector during the study period. The skewness values indicate that all electronic channels are positively skewed, particularly POS (2.4500) and MOT (2.6200), suggesting a long right tail and the presence of extremely high transaction volumes in a few quarters. Kurtosis values for POS (4.6200) and MOT (5.7300) further confirm the leptokurtic nature of these series, involve peaked distributions with heavy tails. The Jarque-Bera test shows statistically significant results for POS, INB, and MOT ($p < 0.01$), confirming departures from normality, while ATM and CAR do not significantly deviate from a normal distribution at the 5% level. These results highlight the uneven and rapidly growing nature of electronic banking transactions in Nigeria, with implications for banking infrastructure, regulatory supervision, and digital fiscal inclusion strategies. However, the cashless policy variables were logged to ensure that they are the same order with the dependent variable: bank soundness

Correlation Analysis

The correlation analysis was conducted to assess the degree of linear relationship between the independent and dependent variables. Two correlation tests were conducted which are Spearman Rank Correlation and Pearson Correlation. Justifiably, if the data is normally distributed, the Pearson correlation is appropriate. However, if the data deviates from familiarity, contains outliers, or exhibits a monotonic but non-linear relationship, Spearman correlation is a better choice because it is more robust to such deviations. Specifically, Table 4.3 presents the results of the link analysis for the pairs of variables underneath consideration:

Table 2: Covariance Analysis

Date: 06/14/25 Time: 15:13

Sample: 2012Q1 2023Q4

Included observations: 48

Correlation Cases	CAR	ATM	POS	INB	MOT
CAR	1.000000				
ATM	-0.414416	1.000000			
POS	-0.728038	0.073773	1.000000		
INB	-0.712948	0.023643	0.035519	1.000000	
MOT	-0.607214	0.084303	0.069713	0.030091	1.000000

Source: Authors' Collation Using Eviews 9 (2025)

Table 2 presents the Pearson correlation coefficients between the capital adequacy ratio (CAR) and key indicators of Nigeria's cashless policy such as ATM transactions, POS transactions, Internet banking (INB), and mobile transactions (MOT) covering quarterly data from 2012Q1 to 2023Q4 (48 observations). The results reveal a consistent negative monotonic liaison between CAR and all the cashless policy variables. Specifically, CAR shows a strong negative correlation with POS (-0.7280), INB (-0.7129), and MOT (-0.6072), while the relationship with ATM is moderately negative at -0.4144. This suggests that as cashless transactions increase in volume and prominence, there may be a tendency for the capital adequacy of banks to weaken. The implication is that the growth of cashless financial services could exert additional pressure on banks' capital structures, possibly due to the rising cost of infrastructure, knowledge risk, and the expansion of financial assets. In contrast, the relationships among the cashless indicators themselves are weak and positive. For instance, ATM and POS transactions are only slightly positively correlated (0.0738), as are INB and POS (0.0355), and MOT and INB (0.0301). These weak interrelationships suggest that different cashless channels are being adopted independently or serve distinct purchaser segments and transaction needs.

Overall, the analysis indicates that while Nigeria's cashless policy has contributed to the growth of various digital transaction platforms, it may also be associated with a reduction in banks' capital adequacy (soundness). This underscores the need for regulator and banks to ensure that the pace of digital transformation is matched with ample capital planning and risk mitigation strategies.

Regression Results

The study specifically considered four (4) cashless policies against three bank soundness on quarterly basis. Prior to running the regression, cashless policy proxies were logged in their natural forms to avoid spurious regression and also to ensure that they are in the same classify with the bank soundness proxy (see Appendix 1). Nevertheless, model 1 departed sharply from the normality and Homoskedasticity assumption of regression analysis. Hence, the GLM was appropriate technique. Consequently, the GLM estimates are presented thus:

Table 3: Generalized Linear Model (OPG - BHHH / Marquardt steps)

Dependent Variable: CAR

Date: 06/14/25 Time: 15:46

Sample: 2012Q1 2023Q4

Included observations: 48

Family: Normal

Link: Identity

Dispersion computed using Pearson Chi-Square

Convergence achieved after 1 iteration

Coefficient covariance computed using observed Hessian

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	16.05824	1.885829	8.515216	0.0000
LOG(ATM)	0.504363	0.116533	4.328054	0.0000
LOG(POS)	-3.591139	0.392738	-9.143860	0.0000
LOG(INB)	0.513579	0.200350	2.563405	0.0104
LOG(MOT)	2.553167	0.385944	6.615387	0.0000
Mean dependent var	15.27063	S.D. dependent var	2.218161	
Sum squared resid	53.29420	Log likelihood	-70.76011	
Akaike info criterion	3.156671	Schwarz criterion	3.351588	
Hannan-Quinn criter.	3.230331	Deviance	53.29420	
Deviance statistic	1.239400	Restr. deviance	231.2513	
LR statistic	143.5832	Prob(LR statistic)	0.000000	
Pearson SSR	53.29420	Pearson statistic	1.239400	
Dispersion	1.239400			

Source: Authors' Computation (2025)

The model diagnostics reveal key information about the adequacy and reliability of the Generalized Linear Model (GLM) used to estimate the determinants of the Capital Adequacy Ratio (CAR). The mean of the dependent variable (CAR) is 15.27063, with a standard deviation of 2.218161, indicating moderate variability in CAR across the illustration quarters. The sum of squared residuals (53.29420) suggests a reasonably good fit, as the residuals (differences between observed and predicted values) are relatively small. The log-likelihood value of -70.76011, though negative as expected in maximum likelihood inference, serves as a reference point for comparing model specifications. Model selection criteria such as the Akaike Information Criterion (AIC = 3.1567), Schwarz Criterion (SC = 3.3516), and

Hannan-Quinn Criterion ($HQ = 3.2303$) are all within acceptable ranges, indicating that the model balances goodness-of-fit with parsimony. The deviance statistic (1.2394) and Pearson statistic (1.2394) both suggest that the model is correctly specified with no signs of over-dispersion, as their values are close up to 1. Additionally, the Likelihood Ratio (LR) statistic of 143.5832 with a probability of 0.0000 provides strong evidence that the full model significantly improves upon a restricted model. The dispersion parameter of 1.2394 further supports the assumption that the residuals are fittingly distributed. Overall, these indicators confirm that the model is statistically resonance and adequately captures the dynamics influencing bank capital adequacy.

Conclusion and Recommendations

The results indicate that automated teller machine transactions has positive and significant effect on capital adequacy, with a coefficient of 0.504363 and a p-value of 0.0000. POS transactions show strong and consistently negative effect on capital adequacy, with large negative coefficient of -3.591139 and a p-value of 0.0000. Internet banking transactions exhibit a positive and statistically significant influence on capital adequacy, with a coefficient of 0.513579 and a p-value of 0.0104. Mobile banking transactions has the most substantial and statistically significant positive effect on capital adequacy, with a coefficient of 2.553167 and a p-value of 0.0000. The study concludes that digital banking channels significantly influence the capital strength of deposit money banks in Nigeria.

Amongst the recommendations is that Banks should continue to invest in ATM infrastructure, enhance accessibility, and improve system reliability to sustain their positive effect on capital adequacy. Banks should evaluate the cost-efficiency of POS operations, strengthen fraud prevention mechanisms, and implement monitoring frameworks to mitigate their negative impact on capital adequacy. Banks should improve the security and functionality of internet banking platforms and promote customer awareness to increase usage and maintain their positive contribution to capital strength. Banks should prioritize the expansion of mobile banking services, optimize mobile app performance, and integrate innovative financial solutions to reinforce its strong positive influence on bank soundness.

References

- Abdullahi, H. M., &Nyaoga, R. B. (2017).Machines usage on operational performance of commercial banks in Nakuru County, Kenya.*Kenya International Journal of Economics, Finance and Management Sciences*, 5(3), 162-167.
- Acha, I. A., Kanu, C.&Agu, G.A. (2017). Cashless policy in Nigeria: The Mechanics, Benefits and Problems .*Innovative Journal of Economics and Financial Studies*. 1(1), 28-38.
- Adegoke K.A., Afolabi ,D.O., &Ademola, A.O. (2024). Effect of electronic payment systems on the performance of microfinance banks in Nigeria. *The Journal of Business Studies*, 08(1), 57-72.
- Aduaka, U., &Awolusi, O. D. (2020).Electronic banking and profitability in the Nigerian banking industry. *Information Management and Business Review*, 12(2 (I)), 20-37.
- Agu, B. O., & Nwankwo, S.N.P., (2019).Effect of electronic banking system on financial performance of selected deposit money banks in Nigeria, 2008 – 2017).*Journal of Accounting Information and Innovation*. 5(9), 1-10.
- Akara, C.K., &Asekome, M.O. (2018).Cashless policy and commercial banks profitability in Nigeria.*Advances in Social Sciences Research Journal*, 5(3), 395-406.
- Akwam, P. O., &Yua, H. (2021). Effect of Financial Products on the Performance of Selected Deposit Money Banks in Nigeria: 2005-2019. *European Journal of Accounting, Auditing and Finance Research*, 9 (1), 124-143.
- Ali, P. I. (2016). Impact of automated teller machine on banking services delivery in Nigeria: a stakeholder analysis. *Cadernos de EducaçãoTecnologiae Sociedade*, 9 (1), 64-72.
- Al-Naimi, A., Yaseen, A., Alnaimat, M., Abed, S., &Farooq, U. (2024). The Impact of Information and Communication Technology on Commercial Banks' Performance: Evidence from MENA. *Uncertain Supply Chain Management*, 12(3), 1997-2004.
- Chimanga, M. K., &Kawimbe, S. (2024). Analyzing the Impact of Mobile Banking on Commercial Banks' Financial Performance: A Case of FNB Bank-Zambia. *Saudi J Econ Fin*, 8(1), 1-8.
- Ehiedu, V. C., Onuorah, A. C. C., &Ofure, J.C..(2023). E-payment system (EPS) and efficiency of banks in Nigeria. *International Journal of Applied Research in Social Sciences*, 5(1), 1-13.
- Ekele, J. S., &Ukpata, I. S. (2020). Implications of Electronic Banking on Commercial Banks' Performance in Nigeria (2000-2017). *International Journal of Modern Management Sciences*, 8(1), 42-60.
- Ene, E. E., Abba, G. O., &Fatokun, G. F. (2019). The impact of electronic banking on financial inclusion in Nigeria. *American Journal of Industrial and Business Management*, 9(6), 1409-1422.
- Gbanador, M. A., Makwe, E.U., & Olushola, O.A. (2022). Financial Innovation and Performance of Deposit Money Banks in Nigeria.*IIARD International Journal of Banking and Finance Research*, 8(2), 37-40.
- Gichungu, Z. N., &Oloko, M. A. (2020), Relationship between Bank Innovations and Financial Performance of Commercial Banks in Kenya, *International Journal of Education and Research*, 3(5), 443-456.
- Haruna, H. A. (2024). Effect of electronic banking on the performance of deposit money banks in Nigeria (2005-2022). *Journal of Accounting and Financial Management*, 10(2), 47-67.
- Hassan, S. U., Mamman, A., &Fariuk, M. A. (2017). Electronic banking products and *Technology and Application*, 1(10), 38-148.
- Hu, H., Wei, T., & Wang, A. (2025). Does digital transformation enhance bank soundness? Evidence from Chinese commercial banks. *Journal of Financial Stability*, 76, 101374.

- Ibekwe, A. O. (2021). Financial Innovation and Performance of Deposit Money Banks in Nigeria. *International Journal of Business & Law Research*, 9(1), 162-173.
- Idris, B. (2018). Customer satisfaction of automated teller machine (ATM) based on service quality. *The West East Institute 41 International Academic Conference Proceedings New Orleans, USA*.
- Inyada, S.J., Ezechukwu, B.O., Ayem-Fella, T.F., Ezuma, C.O., Ebisi, L.N., & Okoroiwu, K.L. (2021). Insecurity of cash-less banking transactions: an empirical evidence from Nigerian banks. *Academy of Accounting and Financial Studies Journal*, 25(5), 1-23.
- Jegede, C. A. (2018). Effects of automated teller machine on the performance of Nigerian Banks, *American Journal of Applied Mathematics and Statistics*, 2(1), 40-46.
- Kipchoge, E. K., & Mutuku, M. (2024). mobile banking and financial performance of microfinance banks in Nairobi city county, Kenya. *International Research Journal of Economics and Finance*, 6(1), 10-22.
- Lasisi, M. A. R., & Abubakar, S. J. (2020). An empirical study of automated teller machine (ATM) and user satisfaction in Nigeria: A study of united bank for Africa in Sokoto metropolis: *International Journal of Management Technology*, 2(3)1- 11.
- Mohammed, Z., Ibrahim, U. A., & Muritala, T. A. (2022). Effect of payments system innovations on the financial performance of commercial banks in Nigeria. *Journal of Service Science and Management*, 15(1), 35-53.
- Morufu, O. (2016). E-payments adoption and profitability performance of deposits money banks in Nigeria. *IPASJ International Journal of Information Technology*, 4(3), 40-50.
- Mugane, M. (2020). Mobile banking services effect on financial performance on commercial banks in Kenya. *International Journal of Socio-technology and Knowledge Development*, 12, 79-98.
- Muia, S. (2017). The effect of financial innovations on financial performance of commercial banks in Kenya. Unpublished Masters' Thesis Submitted to the School of Business and Public Management at KCA University.
- Ngango, A., Mbabazize, M., & Shukla, J. (2019). E-Banking and performance of commercial banks in Rwanda: A case of Bank of Kigali. *European Journal of Accounting Auditing and Finance Research*, 3(4), 25-57
- Njenga, S. M., Kiragu, D. N., & Opiyo, H. O. (2019). Influence of financial innovations on financial performance of savings and credit co-operative societies in Nyeri County Kenya. *European Journal of Business and Social Sciences*, 4(6), 88-99.
- Njogu, J. N. (2018). The effect of Internet banking on profitability of commercial banks in Kenya (unpublished Masters' Thesis Submitted to the Department of Business Administration, School of Business, Nairobi).
- Nwakoby, N. P., Okoye, J. N., Ezejiofor, R. A., Anukwu, C. C., & Ihediwa, A. (2020). Electronic Banking and Profitability: Empirical Evidence from Selected Banks in Nigeria. *Journal of Economics and Business*, 3, 637-649.
- Nwankwo, S. N., & Agbo, E. I. (2021). Effect of electronic banking on commercial bank performance in Nigeria. *European Journal of Accounting, Finance and Investment*, 7(1), 68-82.
- Nweze, U., Eze E. C., Nze, D. & Ejeagbasi, G. (2017). Empirical analysis of the effect of cashless policy on the Performance of Banking Industry in Nigeria (2008-2015). *IDOSR Journal of Humanities and Social Sciences*, 2(2), 93-110.
- Nwude, E. C., Igweoji, N. D., & Udeh, S. N. (2020). The role of electronic banking as a tool to financial inclusion in Nigeria. *Noble International Journal of Business and Management Research*, 4(1), 1-8.

- Okonkwo, A., &Ekwueme, C. M. (2022). Effect of electronic payment on financial performance of Nigerian deposit money banks. *International Journal of Advanced Academic Research*, 8(3), 105-117.
- Okoro, A. S. (2018). Impact of Internet banking instruments on the intermediation efficiency of the Nigerian economy, *International Journal of Accounting Research*, 1(6), 14-21.
- Olofin, A. J., Yadua, J. C., Gambo, N., & Muhammad, R. A. (2024). Financial innovations and financial performance of listed deposit money banks in Nigeria. *International Journal of Management Technology*, 11(1), 51-67.
- Olushola, A., Okonkwo, A. A., & Ekwueme, C. M. (2022). Effect of electronic payment on financial performance of Nigeria deposit money banks. *Int J Adv Acad Res*, 8(3), 105-17.
- Ong'era, S. B., &Omagwa, J. (2021). Mobile banking and financial performance of selected commercial banks in Kenya. *International Research Journal of Business and Strategic Management*, 2(1), 79-94
- Oniore, J. O., &Okoli, U. V. (2019). Impact of electronic banking on the performance of money deposit banks in Nigeria. *Noble International Journal of Economics and Financial Research*, 4(9), 83-90.
- Oseni, E. (2024). Evaluation of Nigerian deposit money banks' soundness: Bankometer Model. *Asian Journal of Economics, Business and Accounting*, 24(7), 30-50.
- Oyewole, O.S., Abba, M., Gambo, E. J., Arikpo, I. A. (2017). E-banking and bank performance: evidence from Nigeria. *International Journal of Scientific Engineering and Technology*, 2(8), 766-771.
- Said, F., M., &Kapelach, S. (2019). mobile banking innovation and financial performance of selected commercial banks in Kenya. *Journal of Finance and Accounting*, 3(3), 228- 254
- Sana, H. S., Mohammad, K. M., Hassan, H. S., &Momina, A. (2016). The impact of e-banking on the profitability of banks: A study of Pakistani banks. *Journal of Public Administration and Governance*, 1(1), 31-38.
- Ugbede, J. T., Yahaya, A., & Edicha, M. J., (2019). Effect of electronic payment on financial performance of deposit money banks in Nigeria. *Lafia Journal of Economics and Management Sciences*, 4(1), 114-120.