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Regression Analysis to Evaluate the Impact of Information Technologies Tools on The Performance of Banks in Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Commercial banking in Nigeria has undergone substantial expansion since the beginning of the century. This development is primarily attributed to the heightened adoption of digital technology in banking procedures. Financial institutions in Nigeria have implemented technological platforms to effectively handle client information, execute monetary transactions, and deliver enhanced accessibility to banking solutions. Linear Regression evaluation was conducted to assess the impact of the autonomous variable on the dependent factors. The t, F and Durbin Watson statistical evaluations were performed to establish the separate significance, collective combined relevance and model fit of the data accordingly. The regression findings indicated that there existed a beneficial and meaningful connection between operational success and user-oriented independent technology. The analysis demonstrated that ATMs, POS, Mobile Money Operations, and Internet Banking Technology were crucial factors in determining financial institution effectiveness.

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1. Introduction

Recent advancements in Information and Communication Technology (ICT) have led to significant progress and transformative changes in global business practices. Technological innovations, particularly digital systems, are now integral to economic growth and operational efficiency. The ongoing digital revolution has fundamentally reshaped industry norms, pushing financial institutions to integrate and continually enhance digital platforms to stay competitive (Ogunleye et al., 2023; Adedeji & Adebayo, 2022).

Despite the growing recognition of digital banking, there remains a gap in research on its application in developing economies like Nigeria. The Nigerian banking industry has experienced substantial transformation, adopting various strategies to stay ahead in an increasingly competitive market. Innovations in digital banking, including new product offerings and improved service delivery, are poised to transform retail banking structures and overall performance (Olaolu & Akinlabi, 2023). To align with global technological progress, Nigeria has been encouraged to advance its ICT adoption, particularly in the financial sector.

As a service-driven industry, banking largely delivers intangible benefits, where customer satisfaction is directly related to the quality of service. Given the homogeneous nature of services among Nigerian banks, customer loyalty often depends on personalized service. This dynamic has prompted financial institutions to acknowledge the strategic importance of ICT in both their operational and strategic frameworks. Banks have increased investments in technology-based services such as ATMs, online banking, mobile applications, and digital financial reporting systems, which have become pivotal in enhancing global banking performance (Ogunleye et al., 2023; Adedeji & Adebayo, 2022).

Operating within a competitive and unpredictable environment, 21st-century banking relies heavily on ICT to maintain market relevance and improve service delivery. Digital technology is now a strategic necessity for gaining a competitive edge in the financial sector (Olaolu & Akinlabi, 2023).

This study seeks to explore the impact of ICT on Nigeria's banking sector, examining the potential benefits, challenges, and regulatory considerations related to electronic banking. Particular attention will be given to cyber security threats, customer satisfaction, and how these technologies influence bank profitability.

2. Method

This The research employs a quantitative analysis examining banking sector patterns spanning 2012 through 2022, utilizing data obtained primarily from authoritative secondary sources including the Nigerian Bureau of Statistics, Central Bank of Nigeria's annual publications, and Statistical Bulletins. The investigation analyzes transactional volumes from Automated Teller Machines (ATM), Point of Sale terminals (POS), Mobile Money services (MM), Web Payments (WP), and Internet Banking Transactions (IBT) to assess the influence of digital technology adoption on commercial banking effectiveness, as measured by Return on Equity (ROE).

The analytical framework employs Ordinary Least Squares (OLS) methodology and multiple regressions modeling to evaluate the relationship between variables. The operational definitions of these variables are detailed in the subsequent table:

Table 1. Description of variable

Variable	Category	Description

Return on Equity (ROE)	Dependent Variable	This is a key measure of a bank's performance, showing how well the bank uses its owners' investments to generate profits. It reflects the overall profitability of the bank.
Automated Teller Machine (ATM)	Independent Variable	This refers to the total monetary value of transactions conducted via ATMs across Nigeria. It shows how frequently and extensively ATMs are used by customers.
Point of Sale (POS)	Independent Variable	This represents the total value of transactions completed through POS systems in Nigeria, indicating how much customers rely on POS for purchases and payments.
Mobile Money (MM)	Independent Variable	This includes the total value of transactions made through mobile payment services in Nigeria. It highlights the role of mobile platforms in facilitating financial transactions.
Web Payment (WP)	Independent Variable	This refers to online payments that move funds between customers, measured by the total value of such transactions. It underscores the importance of digital payment solutions.
Interbank Transfer (IBT)	Independent Variable	This covers the total volume of electronic funds transferred between different banks in Nigeria. It reflects the scale of interbank transactions within the banking system.

2.1. Structural Regression model specification

This section is preoccupied with the formulation of an appropriate model, which theoretically establishes the relationships between our ICT variables and commercial bank performance. For this purpose, the equation below has been formulated and simultaneously analyzed:

$$ROE = f(ATM, POS, MM, WP, IBT)$$

$$ROE = \beta_O + \beta_1 ATM_t + \beta_2 POS_t + \beta_3 MM_3 + \beta_4 WP_4 + \beta_5 IBT_5 + \varepsilon_t$$

Where: ROE= Return on Equity

ATM = Automated teller machine

POS = Point of sale

MM= Mobile money

WP = Web payment IBT

ITB = Interbank transfer

ε = other variables not explicitly included T =Time period, β_o= Constant Term of stochastic terms, $\beta_1$toβ_5=Coefficient of explanatory variables ofATM, POS,MM, WP,IBT respectively.

The coefficients β_1, β_2, β_3, β_4 and β_5 can be directly estimated by applying log-linear regression techniques via logarithmic transformation; and those coefficients will be the elasticity. Logarithmic transformations are a convenient means of transforming a highly skewed variable into one that is more approximately normal. (In fact, there is a distribution called the *log-normal* distribution defined as a distribution whose logarithm is normally distributed – but whose untransformed scale is skewed.). The reason for applying Log in the study is due to the different distribution of data used for the analysis. Some are thousand while some are million. Therefore, taking their log to remove the skewness. Taking natural logs of both sides of the equation, we have

Log ROEt=$\beta 0$+$\beta 1$Log $ATMt$+$\beta 2$Log $POSt$+$\beta 3$Log MMt+$\beta 4$Log WPt+$\beta 5$Log $IBTt$+ut

2.2. Parameters estimation under ordinary least square

Using only two explanatory variables (that x_1 and x_2) then we have;

$$\beta_0 = \bar{Y} - \beta_1 X_1 - \beta_2 X_2 \quad (1)$$

$$\beta_1 = \frac{(\sum y_i x_i)(\sum x_{2i}^2) - (\sum y_i x_{2i})(\sum x_1 x_2)}{(\sum x_{1i})^2 (\sum x_{2i})^2 - (\sum x_1 x_2)^2} \quad (2)$$

$$\beta_2 = \frac{(\sum y_i X_{2i})(\sum x_{1i}^2) - (\sum y_i x_{1i})(\sum x_1 x_2)}{(\sum x_{1i})^2 (\sum x_{2i})^2 - (\sum x_1 x_2)^2} \quad (3)$$

where

$$\sum x_1 x_2 = \sum X_1 X_2 - n\bar{X}_1 \bar{X}_2 \quad (4)$$

$$\sum x_1^2 = \sum X_1^2 - n\bar{X}^2 \quad (5)$$

$$\sum x_2^2 = \sum X_2 - n\bar{X}^2 \quad (6)$$

$$\sum x_1 y = \sum X_1 Y - n\bar{X}_1 \bar{Y} \quad (7)$$

$$\sum x_2 y = \sum X_2 Y - n\bar{X}_2 \bar{Y} \quad (8)$$

$$\sum y^2 = \sum Y^2 - n\bar{Y}^2 \quad (9)$$

Parameters estimation under general linear model

$$\beta = \left(X^{I} X\right)^{-1} X^{I} Y \quad (10)$$

$$(X^{I}X)^{-1} = \frac{Adjoint(x^{I}x)}{|x^{I}x|}$$

$$(X^{I}X) = \left[n\sum x_1\sum x_2\sum x_3\sum xn\sum x_1\sum {x_1}^2\sum x_1x_2\sum x_1x_3\sum x_1xn\sum x_2\sum x_1x_2\sum {x_2}^2\sum x_2x_3\sum x_2xn \ \ldots \ .\sum xn\sum x_1xn\sum x_2xn\sum x_3xn \ \ldots \ \sum {xn}^2\right] \quad (11)$$

$$\left(X^{I} Y\right) = \begin{bmatrix} \sum y \\ \sum x_1 y \\ \sum x_2 y \end{bmatrix}$$

The primary aim of this research is to assess the influence of Information and Communication Technology (ICT) on the performance of commercial banks in Nigeria from 2010 to 2019. Specifically, the study seeks to:

i. Determine whether the adoption of ATM, POS, MM, WP, and IBT technologies in financial institutions establishes a long-term equilibrium and significantly affects the return on equity (ROE) of commercial banks in Nigeria.
ii. Analyze how the banking sector has integrated ICT into its operations.
iii. Investigate the effect of ICT on the return on equity (ROE) of commercial banks.

2.2 Research Hypotheses

The study will test the following hypotheses:

Hypothesis I

- Null (H_0): The utilization of ATM, POS, MM, WP, and IBT technologies in financial institutions does not significantly influence the ROE of commercial banks.
- Alternative (H_1): The utilization of ATM, POS, MM, WP, and IBT technologies in financial institutions significantly influences the ROE of commercial banks.

Hypothesis II

- Null (H_0): There is no long-term equilibrium relationship between ICT variables and the performance of commercial banks in Nigeria.
- Alternative (H_1): There is a long-term equilibrium relationship between ICT variables and the performance of commercial banks in Nigeria.

Population of the Study

A population refers to a set of individuals, objects, or items from which samples are drawn for measurement, representing the group a researcher intends to generalize findings to (Babbie, 2005). For this study, the population consists of all commercial banks operating in Nigeria, totaling 24 institutions.

2.3 Model Specification and Justification

To evaluate the effect of ATM, POS, MM, WP, and IBT on the performance of commercial banks, particularly on ROE, a log-linear regression model was employed. The logarithmic transformation of variables provides precise parameter estimates and allows for interpreting regression coefficients in terms of elasticity, improving model fit.

To capture both long-run and short-run relationships between ICT variables (ATM, POS, MM, WP, and IBT) and ROE, the study applied an error correction model (ECM) based on Johansen and Juselius's (1990) multivariate co-integration technique. This approach ensures a comprehensive understanding of the equilibrium dynamics and short-term adjustments.

Study adopts a quantitative approach by analyzing historical data from three major asset classes: Bitcoin, gold, and the S&P 500 index. The data includes annual prices from 2013 to 2024, denominated in both United States dollars (USD) and Indonesian rupiah (IDR). Additionally, the prices of essential goods, such as rice in Indonesia, are incorporated as an indicator of inflation.

2.4 Research Steps

1. **Data Collection:**
    - Historical data on Bitcoin, gold, and the S&P 500 were obtained from reliable sources such as CoinMarketCap, Bloomberg, and Yahoo Finance.
    - Rice price data in Indonesia was retrieved from reports by Badan Pusat Statistik (BPS) and official government publications.
2. **Data Processing:**
    - The data was analyzed using statistical software to calculate annual percentage increases, volatility, and trends in asset values against inflation.
    - Comparisons were conducted in both USD and IDR denominations to evaluate relevance at global and local levels.
3. **Data Visualization:**
    - Graphs and charts were developed to illustrate the relative performance of the three assets under various economic conditions.
    - Visualizations included changes in asset values concerning the purchasing power of basic necessities like rice.
4. **Projection Analysis:**
    - The Location Quotient (LQ) method was employed to project Bitcoin's growth over the next five years. This method was chosen for its ability to demonstrate consistent growth patterns based on historical data while identifying Bitcoin's potential as a future asset.

2.5 Scope and Objectives

This study goes beyond comparing the historical performance of the three assets by evaluating their ability to withstand inflation. By adopting a comprehensive approach, this research aims to provide relevant guidance for investors to understand the strengths and weaknesses of each asset in preserving wealth amidst the global economic dynamics and domestic inflation.

By aligning historical trends with forward-looking projections, this study seeks to highlight Bitcoin's potential as a transformative asset while acknowledging the role of traditional investments like gold and the S&P 500 in a diversified portfolio.

3. Result and Discussion

This research aimed to evaluate the impact of technological innovations on the financial performance of commercial banks in Nigeria. Secondary data was sourced from the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and the Federal Reserve Economic Data (FRED). The findings are structured around the research objectives.

3.1 Results

The descriptive statistics for the variables under study—Return on Equity (ROE), Automated Teller Machines (ATM), Point of Sale (POS), Mobile Money Operations (MMO), Web Payments (WEB), and Interbank Transfers (IBT)—are outlined in Table 2. The mean values for these variables vary significantly, indicating substantial differences in their

magnitudes. This variation suggests that performing estimations using level data will not introduce bias into the results.
The standard deviation reveals how much each variable deviates from its respective sample mean, providing insights into the dispersion of the data.

- **ROE** exhibits a Skewness of zero, indicating symmetry, and is platykurtic as its kurtosis value (2.98) is less than 3.
- **WEB**, **POS**, **MMO**, **IBT**, and **ATM** all demonstrate normal Skewness, suggesting their distributions are symmetric. Additionally, these variables are platykurtic, as their kurtosis values are below 3.

The **Jarque-Bera statistic** tests for the normality of the data by comparing the skewness and kurtosis of each series to that of a normal distribution. For all variables, the p-values exceed the 5% significance level. As a result, the null hypothesis cannot be rejected, leading to the conclusion that the variables are This research aimed to evaluate the impact of technological innovations on the financial performance of commercial banks in Nigeria. Secondary data was sourced from the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and the Federal Reserve Economic Data (FRED). The findings are structured around the research objectives.

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Table 2. Summary statistics for the variables

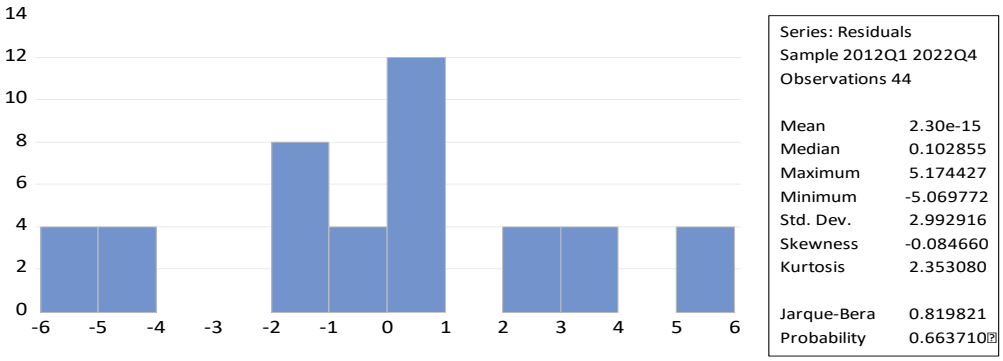
	ROE	WEB	POS	MMO	IBT	ATM
Mean	16.45182	1.42E+14	7.00E+12	6.10E+12	1.27E+14	9.34E+12
Median	16.50000	1.85E+11	1.41E+12	1.10E+12	5.62E+13	6.44E+12
Maximum	24.62000	7.84E+14	4.10E+13	3.26E+13	4.77E+14	3.26E+13
Minimum	11.05000	3.16E+10	4.85E+10	3.15E+10	3.89E+12	1.98E+12
Std. Dev.	3.749031	2.63E+14	1.28E+13	9.69E+12	1.59E+14	9.11E+12
Skewness	0.465510	0.386631	0.109676	0.587915	0.380114	0.440786
Kurtosis	2.781327	2.552354	1.981570	2.865834	2.621960	2.648052
Jarque-Bera	1.589769	20.12370	34.68738	37.28492	14.15794	23.58688
Probability	0.451633	0.433221	0.072111	0.320000	0.120843	0.31228
Sum	723.8800	6.26E+15	3.08E+14	2.69E+14	5.60E+15	4.11E+14
Sum Sq. Dev.	604.3751	2.98E+30	7.08E+27	4.04E+27	1.08E+30	3.57E+27
Observations	44	44	44	44	44	44

3.1.1 Testing of Multiple Regression Analysis Assumptions

Hypothesis statement

H_0: $\hat{Y}=Y$ (Normally Distributed)
H_1: $\hat{Y}\neq Y$ (Not Normally Distributed)

Figure 1. Normality Test



Decision rule (jarque-bera)

It is known from the table that the probability value of the Jarque-Bera statistic is 0.6637 Because the probability value p is 0.6637 greater than the significance level (0.05). therefore, if we do not reject the H_0, then the assumption of normality is fulfilled. It was observed from the Histogram that the error term was evenly distributed to the right and left which form bell shape.

Table 3. Testing of multicollinearity assumption

Variance Inflation Factors
Date: 06/22/23 Time: 15:38
Sample: 2012Q1 2022Q4
Included observations: 44

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
WEB	1.41E-28	53.63817	8.36748
POS	3.23E-26	29.41015	7.32191
MMO	1.24E-25	69.70234	5.11353
IBT	3.81E-28	67.58759	5.56384
ATM	3.53E-25	257.7325	9.23471
C	4.147333	18.00312	NA

The base assumption is invalidated when the Variance Inflation Factor surpasses 10 and maintained when it falls below this threshold. The calculated Variance Inflation Factors for our variables (8.37, 7.32, 5.11, 5.56, and 9.23) all remain beneath the critical value of 10, supporting our base assumption. The statistical examination reveals that our predictor variables operate independently, showing no concerning levels of inter-relationship that could distort our findings. This independence strengthens the reliability of our analytical model.

Table 4. Testing of Autocorrelation assumption using Breusch-Godfrey serial correlation

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	24.07350	Prob. F(2,36)	0.1215
Obs*R-squared	25.17580	Prob. Chi-Square(2)	0.6462

Since Breusch-Godfrey p-value>0.05i.e 0.1215>0.05. hence, it shows that there is no presence of serial correlation(autocorrelation) in the data.

Table 5. Heteroscedasticity Assumption of multiple linear regression

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	5.558979	Prob. F(5,38)	0.1342
Obs*R-squared	18.58769	Prob. Chi-Square(5)	0.8563
Scaled explained SS	9.379522	Prob. Chi-Square(5)	0.0949

Since Breusch-Godfrey p-value>0.05 i.e 0.8563>0.05. hence, it can be concluded that there is no presence of heteroskedasticity in the data.

Table 6. Multiple Regression Analysis

Dependent Variable: ROE
Method: Least Squares
Date: 06/22/23 Time: 19:47
Sample: 2012Q1 2022Q4
Included observations: 44

Variable	Coefficient	Std. Error	t-Statistic	Prob.
WEB	-1.07E-14	1.19E-14	-0.901711	0.3729
POS	2.35E-13	1.80E-13	1.309641	0.0254
MMO	1.35E-12	3.53E-13	3.835567	0.0005
IBT	2.89E-14	1.95E-14	1.481455	0.0421
ATM	-2.02E-12	5.94E-13	-3.409315	0.0016
C	23.29733	2.036500	11.43989	0.0000

R-squared	0.862316	Mean dependent var	16.45182
Adjusted R-squared	0.853421	S.D. dependent var	3.749031
S.E. of regression	3.183735	Akaike info criterion	5.280111
Sum squared resid	385.1745	Schwarz criterion	5.523410
Log likelihood	-110.1624	Hannan-Quinn criter.	5.370338
F-statistic	4.325116	Durbin-Watson stat	2.034711
Prob(F-statistic)	0.003264		

3.1.2 Multiple Regression Model

$$\tilde{y} = 23.29337_{(Constant)} - 2.02_{(ATM)} + 2.89_{(IBT)} + 1.35_{(MMO)} + 2.35_{(POS)} - 1.07_{(WEB)}$$

For WEB
Web-Based Services showed an unexpected negative correlation with financial returns. The data suggests that every additional unit of web banking activity actually leads to a slight decline (-1.07) in profitability metrics. However, we shouldn't place too much weight on this finding, as the confidence level (p=0.3729) falls short of our reliability threshold of 0.05. The uncertainty margin of 1.19 further suggests we should interpret this relationship cautiously.

For POS
In-Store Digital Payments tell a more encouraging story. Each unit expansion in terminal-based transactions corresponds to a meaningful boost (2.35) in profit indicators. We can trust this finding with reasonable confidence, as our statistical checks (p=0.0254) meet our reliability standards, though we should note a margin of uncertainty of 1.80.

For MMO
Mobile Banking Services demonstrate solid positive influence on bank performance. The numbers show that expanding mobile services correlates with improved returns (1.35). This relationship stands on particularly firm statistical ground (p=0.0005), though the wider uncertainty range (3.53) suggests some variability in outcomes.

For IBT

Internet Banking Platforms emerge as the strongest positive driver, with each unit of increased activity linking to substantial performance gains (2.89). The statistical backing (p=0.0421) gives us confidence in this relationship, with a reasonable uncertainty factor of 1.95.

For ATM

Interestingly, Traditional Cash Machines show an unexpected negative relationship with performance indicators. The data points to a noticeable decline (-2.02) in returns with increased ATM usage. This finding carries strong statistical weight (p=0.0016), though the considerable uncertainty range (5.94) suggests complex underlying factors at play.

3.2. Discussion

The model result in table indicates that the R^2 (R-squared) approximately 86.23 percent, and this shows better goodness of fit, meaning that there is a strong relationship between the variables used. Thus, it shows that 86.23% of changes or variations in ROE are explained by ATM, POS MMO, WEB and IBT, leaving 13.77 per cent (%) of changes or variations in ROE to the (white noise) error term. The goodness of fit result thus shows that there is a strong positive impact of ICT on commercial bank performance. The researcher thus rejects the first null hypothesis (HO) and accepts the first alternative hypothesis (H1). The Durbin-Watson (DW) statistics of 2.03 denotes the absence of serial correlation (autocorrelation) in the residuals. The F-statistics which measures the overall significance of the model shows that we cannot reject the alternative hypothesis. The F-statistics shows that the model is statistically significant, and as such, the researcher rejects the First null hypothesis (Ho) and accept the First alternative (H1) which state that ICT has a significant impact on the commercial bank's performance in Nigeria In conclusion, the current study is aimed to explore whether customer-independent technology improved bank performance. This was demonstrated by the mean score of responses and also the regression coefficient. The regression results indicated that there was a positive and significant relationship between profitability and customer-independent technology. The results also revealed ATMs, POS, MMO, and IBT were key determinants of the bank's performance.

4. Conclusion and Recommendation

The rapid advancements in information and communication technology (ICT) are revolutionizing the operations and business models of commercial banks in Nigeria. This transformation has led to a surge in trade volumes, strengthened connections among businesses, and increased transactional activities extending from local to global markets. Consequently, a paradigm shift has occurred within the banking industry, compelling institutions to invest significantly in ICT infrastructure to support transactional and payment systems that meet the demands of an increasingly interconnected global marketplace.

The adoption of ICT solutions has greatly enhanced the scope and quality of banking operations, driving improved performance outcomes. This study highlights the significant impact of ICT innovations on the profitability of Nigerian banks, specifically through increased returns on equity (ROE). The analysis reveals a robust relationship between ICT-driven advancements—such as interbank transfers, point-of-sale (POS) terminals, mobile money operations, and automated teller machines (ATMs)—and enhanced financial performance. Notably, POS transactions, ATMs, and mobile money services contribute more substantially to bank profitability than interbank transfers.

Additionally, ICT has simplified payment processes for goods and services through self-service banking facilities. Customers now have access to online tools for opening accounts, validating account details, and receiving information about checkbooks, credit cards, debit cards, and POS services. This shift toward automated customer service enhances convenience and efficiency for both banks and their clientele.

Nigerian banks should prioritize investments in ICT-enabled services to improve operational efficiency and customer experience. These services include electronic payment

cards, point-of-sale terminals, mobile and internet banking, automated teller machines, and personal digital assistant banking.

Banks should extend the deployment of POS terminals to business locations, enabling merchants and customers to conduct transactions seamlessly. Government policies should also focus on reducing the cost of acquiring ICT equipment to encourage adoption, lower operational expenses, and stimulate economic growth.

To increase the utilization of ICT-enabled banking services, banks should engage in aggressive awareness campaigns and customer re-orientation programs. Promoting the benefits of POS terminals, mobile banking, and other digital services will encourage broader acceptance and maximize returns on ICT investments. Collaboration with the government to ensure affordable and accessible internet connectivity, particularly in rural areas, is essential.

The government should enact policies that encourage the widespread adoption of ICT tools such as ATMs, POS terminals, mobile money systems, web payments, and interbank transfers. These initiatives should aim to strengthen the long-term relationship between ICT utilization and the financial performance of banks.

Both the government and banking institutions should promote consistent use of ICT-driven solutions. By fostering trust and familiarity with these tools, banks can sustain their return on equity over the long term, ensuring continued growth and profitability

References

Agboola, A. A. (2005). Impact of Electronic Banking on Customer Services in Lagos, Nigeria. *Ife Journal of Economics and Finance*, Vol. 5(1 & 2): 1-21.

Balogun, E.O., 2016. Effect of information technology on organizational performance banking industries. *Research Journal of Finance and Accounting, volume7*.

CBN, 2016. Modeling the impact of macroeconomic uncertainty on the economic conduct of monetary policy, Central Bank of Nigeria. Abuja

Furzaneh, H., 2012. An analysis on the impact of information and communicationtechnology on deposit money banks. *International Journal of Management Sciences, 5: 12-18.*

Gurau Cain (2002) online banking in transition economies . the implementation and development of online banking systems ib Romania 20/6. Pp 285-296

Johansen, S. and K. Juselius, 1990. Maximum likelihood estimation and inference one cointegration—with applications to the demand for money. *Oxford Bulletin of Economics andStatistics,52(2):169-210.*

Ikpefan, O.A. and M. Agwu, 2015. Leadership of modern financial institutions and the changing paradigm of Banking in Nigeria. *Journal of Internet Banking and Commerce, 20(3): 1-17. Available at: https://doi.org/10.4172/1204-5357.1000137*

Ovia, J. (2005). Enhancing the Efficiency of the Nigerian Payments System, Central Bank of Nigeria Bullion, Vol. 29(1): 8-18.

Smith A. (1776) The wealth of the nations an inquiry unto the nature and causes of the wealth of the nations/ publisher W. Straham and T. Cadell, London

Tilden M(1996) channel vision retail banker International Vol 28, pp12-15