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Financial Deepening And Bank Profitability In Nigeria

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ABSTRACT
This study examined the relationship between financial deepening and bank profitability in Nigeria using annual time series data from 1990 to 2025. The study adopted an ex-post facto research design in order to evaluate the influence of financial deepening indicators on bank profitability. Return on Assets (ROA) was used as a proxy for bank profitability, while Broad Money Supply (BMS), Credit to Private Sector (CPS), Loan-to-Deposit Ratio (LDR), and Inflation Rate (INFR) served as explanatory variables. Secondary data were sourced from the Central Bank of Nigeria Statistical Bulletin and analyzed using descriptive statistics, Augmented Dickey-Fuller (ADF) unit root test, Johansen cointegration test, Vector Error Correction Model (VECM), and Pairwise Granger Causality test. The findings revealed that all variables were integrated of order one and exhibited long-run equilibrium relationships. The VECM results indicated the existence of both short-run dynamics and long-run interactions among the variables. Specifically, CPS significantly influenced BMS, while BMS exerted a positive and significant effect on CPS. The explanatory variables jointly accounted for substantial variations in ROA, BMS, CPS, and LDR, although INFR showed weak explanatory power. The Granger causality results further revealed significant causal relationships among BMS, CPS, LDR, and ROA. The study concluded that financial deepening plays a significant role in influencing bank profitability in Nigeria through enhanced credit expansion, liquidity management, and financial intermediation. The study therefore recommended policies aimed at strengthening financial sector deepening, improving credit allocation efficiency, and maintaining macroeconomic stability to enhance bank profitability and sustainable financial sector growth.

Keywords: Financial Deepening, Broad Money Supply, Credit to Private Sector, Loan-to-Deposit Ratio, Inflation Rate, Bank Profitability, Return on Assets

INTRODUCTION

Financial deepening has increasingly become a central theme in the discourse on banking sector performance, particularly in emerging economies such as Nigeria where financial systems are evolving in response to structural reforms, technological innovation, and macroeconomic instability. Broadly, financial deepening refers to the expansion, accessibility, and efficiency of financial services, often measured through indicators such as broad money supply, credit to the private sector, and banking sector liquidity ratios. Recent empirical literature emphasizes that improvements in these indicators enhance financial intermediation, facilitate resource allocation, and stimulate productive investment, thereby influencing bank profitability and overall economic performance (Ozor, 2023; Keremah, 2026). In Nigeria, the financial sector has undergone significant transformations driven by liberalization policies

and regulatory frameworks, which have deepened financial markets and expanded credit channels, yet concerns remain regarding the efficiency and profitability outcomes of these developments.

Theoretically, the nexus between financial deepening and bank profitability is anchored on the McKinnon–Shaw hypothesis, which posits that a well-developed financial system enhances savings mobilization and allocative efficiency, ultimately improving financial sector performance. Recent studies confirm that key financial deepening indicators, particularly money supply and credit to the private sector, play a significant role in shaping economic and financial outcomes in Nigeria (Akinbobola & Oladipo, 2024; Eme, 2023). Empirical evidence suggests that broad money supply (BMS) enhances liquidity and supports lending activities, while credit to the private sector (CPS) drives investment and income generation, both of which are essential channels through which banks generate returns. Similarly, the loan-to-deposit ratio (LDR) reflects banks' intermediation efficiency, indicating the extent to which mobilized deposits are converted into income-generating assets.

Recent Nigerian-focused studies highlight a positive and statistically significant relationship between financial deepening components and bank performance, suggesting that increased financial sector depth contributes meaningfully to profitability (Olawumi et al., 2023; GPH Journal, 2023). However, these relationships are not always linear or uniformly positive, as macroeconomic conditions such as inflation can moderate the impact. Inflation, as a control variable, influences real returns on assets and affects banks' cost structures, thereby shaping profitability outcomes. Empirical findings indicate that inflation can exert either positive or negative effects on financial stability and bank performance depending on its magnitude and volatility (Ozili, 2025) .

Despite the growing body of literature, gaps persist in integrating multiple financial deepening indicators with profitability measures such as return on assets (ROA), Recent studies point to the need for more comprehensive analyses that consider the interplay between financial depth, efficiency, and macroeconomic stability in Nigeria's banking sector (Adewale & Ojo, 2023; Akinbobola & Oladipo, 2024). Consequently, this study contributes to the existing literature by examining the effect of broad money supply, credit to the private sector, and loan-to-deposit ratio on bank profitability, while controlling for inflation. By doing so, it provides deeper insights into how financial deepening translates into performance outcomes within the Nigerian banking context, offering policy-relevant implications for enhancing financial sector efficiency and stability.

The Nigerian banking sector has experienced substantial financial deepening over the years, evidenced by growth in broad money supply, expansion of credit to the private sector, and adjustments in loan-to-deposit ratios. However, this expansion has not consistently translated into improved bank profitability, particularly when measured by return on assets. This inconsistency raises concerns about the efficiency of financial intermediation and the ability of banks to convert increased financial resources into sustainable returns. Empirical evidence remains inconclusive: while some studies report that financial deepening enhances profitability through improved liquidity and credit expansion (Akinbobola & Oladipo, 2024; Olawumi et al., 2023), others highlight weak or negative effects due to poor credit allocation, rising non-performing loans, and structural inefficiencies within the banking system (Eme, 2023; Adewale & Ojo, 2023). Additionally, macroeconomic instability, particularly inflation, continues to influence bank performance by increasing operational costs and reducing real returns (Ozili, 2025; Yusuf & Salisu, 2024).

Despite growing interest in this area, several research gaps persist. First, existing studies often examine financial deepening indicators in isolation or focus more on macroeconomic outcomes such as economic growth rather than bank-specific performance (Eme, 2023; Akinbobola & Oladipo, 2024). Second, there is limited empirical work that simultaneously integrates broad money supply, credit to the private sector, and loan-to-deposit ratio within a single framework to assess their joint impact on profitability. Third, insufficient attention has been given to the moderating role of inflation in the financial deepening–profitability nexus. (Adewale & Ojo, 2023; Yusuf & Salisu, 2024). These gaps necessitate a comprehensive investigation that captures both financial depth indicators and macroeconomic influences, thereby providing more robust and policy-relevant insights into bank profitability in Nigeria.

REVIEW OF RELATED LITERATURE

CONCEPTUAL REVIEW

Financial Deepening

Financial deepening in Nigeria is conceptualized as the expansion and efficiency of financial intermediation, commonly proxied by broad money supply (M2), credit to the private sector, and banking system liquidity indicators such as the loan-to-deposit ratio. Recent Nigerian empirical literature emphasizes that broad money supply reflects the degree of monetization and liquidity available in the economy, thereby influencing savings mobilization and investment activities. Studies show that increases in money supply enhance financial sector depth and stimulate economic activities through improved access to funds (Ogagaoghene et al., 2024; Eniekezi & Chiazor, 2023). Similarly, findings indicate that broad money supply and financial system deposits significantly drive financial intermediation and credit expansion in Nigeria, reinforcing the theoretical linkage between liquidity growth and financial deepening (Oyebowale & Babatunde, 2026; Innocent, 2026) .

Credit to the private sector (CPS) is another critical proxy of financial deepening, as it captures the extent to which banks channel funds to productive sectors of the economy. Empirical evidence suggests that CPS remains relatively low compared to global benchmarks, despite its strong role in stimulating investment, employment, and economic growth (Oyebowale & Babatunde, 2026; Ebhodoghe et al., 2024). Recent Nigerian studies further reveal that broad money supply and bank deposits positively influence CPS in both the short and long run, highlighting the interconnectedness of financial deepening indicators (Ogagaoghene et al., 2024; Adeola & Babatunde, 2025). Moreover, CPS is recognized as a core indicator of financial development because it excludes government credit and directly measures private sector financing efficiency (Ebhodoghe et al., 2024; Eniekezi & Chiazor, 2023).

The loan-to-deposit ratio (LDR) complements these indicators by measuring the efficiency of banks in transforming deposits into loans, thereby reflecting the intensity of financial intermediation. Higher LDR values typically indicate increased lending activity and deeper financial systems, although excessive levels may signal liquidity risks. Recent Nigerian evidence shows that financial deepening variables, including money supply and private sector credit, jointly enhance financial system performance and economic outcomes (Ogagaoghene et al., 2024; Eniekezi & Chiazor, 2023). Overall, the literature converges on the view that these proxies jointly explain the evolution of financial deepening in Nigeria, with significant implications for banking sector performance and macroeconomic stability.

Bank Profitability

Bank profitability refers to the ability of banks to generate earnings from their operations relative to their asset base, commonly proxied by Return on Assets (ROA), which measures how efficiently management utilizes total assets to produce net income. In the Nigerian banking context, ROA is widely adopted because it captures both operational efficiency and asset utilization in a single indicator. Empirical evidence shows that ROA reflects the overall performance of deposit money banks and serves as a key metric for evaluating managerial effectiveness, risk exposure, and financial sustainability (Abdulrauf et al., 2023; Apere, 2024). Recent studies further emphasize that profitability in Nigerian banks is influenced by internal factors such as asset quality, liquidity, and cost efficiency, with ROA providing a comprehensive measure that integrates these elements into a single performance outcome (Obeten, 2025; Enabulu, 2025).Moreover, contemporary Nigerian literature highlights that ROA is particularly relevant in assessing how well banks convert their lending activities and financial intermediation roles into profits. Since lending constitutes the primary income-generating activity of banks, efficient loan portfolio management and risk control significantly determine ROA outcomes. Empirical findings reveal that factors such as loan quality, non-performing loans, and liquidity conditions have direct implications for bank profitability, often enhancing or eroding returns depending on management efficiency (Eleje et al., 2025; Oke et al., 2023). Additionally, evidence suggests that improved liquidity management and reduced credit risk contribute positively to ROA, reinforcing the role of prudent financial management in sustaining profitability (Apere, 2024; Kanu, 2025). Overall, ROA remains a robust and widely accepted

proxy for bank profitability in Nigeria because it captures both income generation and asset efficiency while reflecting the impact of macroeconomic and institutional factors.

THEORETICAL FRAMEWORK

The Financial Intermediation Theory

The Financial Intermediation Theory provides the most direct foundation for this study. It posits that banks act as intermediaries between surplus and deficit units, mobilizing savings (captured by Broad Money Supply) and allocating credit to the private sector (CPS) to stimulate productive investment. The Loan-to-Deposit Ratio (LDR) reflects how efficiently banks transform deposits into loans, while profitability (ROA) represents the outcome of this intermediation process. The theory suggests that deeper financial systems enhance resource allocation efficiency, thereby improving bank profitability through increased lending activities and income generation.

The Modern Portfolio Theory

The Modern Portfolio Theory is also relevant, as it explains how banks allocate assets to maximize returns while minimizing risk. Within this context, CPS and LDR reflect portfolio choices between risk and return, while ROA measures the performance of such allocations. Efficient diversification and risk management are expected to improve profitability.

Liquidity Preference Theory

This Theory explains how money supply (BMS) and interest rates influence liquidity decisions. It suggests that banks balance liquidity and profitability, where excessive liquidity reduces returns, while optimal lending (via CPS and LDR) enhances ROA. Together, these theories provide a comprehensive framework linking financial deepening indicators to bank profitability.

EMPIRICAL REVIEW

Recent empirical studies on financial deepening and bank profitability provide strong evidence on the linkage between monetary aggregates, credit allocation, and bank performance. Lucky (2026) examined the effect of financial deepening on commercial bank soundness in Nigeria with the objective of assessing how credit to the private sector influences bank stability and profitability. Using time-series and cross-sectional data (2014–2023) sourced from the Central Bank of Nigeria and bank financial statements, the study employed regression analysis and found that credit expansion significantly improves bank soundness and performance. The study concluded that financial deepening enhances banking sector resilience and recommended policies that promote sustainable credit growth. Similarly, Enabulu (2025) investigated the relationship between funding structure and bank profitability in Nigeria using panel data (2010–2024) and regression techniques. The findings revealed that weak deposit structures reduce profitability (ROA), leading to the recommendation that banks should strengthen deposit mobilization strategies.

Adebayo (2025) analyzed the effect of financial practices on bank profitability with ROA as the dependent variable, using panel data from 2015–2024 and applying panel regression analysis. The study found that internal financial practices significantly influence profitability and concluded that efficient financial management enhances bank performance, recommending stricter regulatory monitoring. Additionally, a 2025 study on financial sector development examined the impact of broad money supply and credit to the private sector on economic outcomes in Nigeria using time-series data (1990–2024) from World Bank sources and econometric techniques such as cointegration and ECM. The findings showed a positive and significant relationship between financial deepening indicators and performance outcomes, with recommendations for policies that expand credit access.

Keremah (2026) also investigated financial deepening and entrepreneurial development using annual data (1981–2024) and regression analysis, finding that money supply and private sector credit significantly stimulate economic activities, thereby indirectly improving banking performance. The study recommended enhanced financial inclusion policies.

RESEARCH METHODOLOGY

Research Design: The study adopts an ex-post facto research design. This design enables the investigation of the dynamic relationship between financial deepening indicators and bank profitability using already existing macro-financial data.

Population of the Study: The population comprises all Deposit Money Banks (DMBs) operating in Nigeria and the macroeconomic financial system.

Sample and Sampling Techniques: A census sampling technique is employed, covering the entire available annual time-series data from 1990 to 2025. This ensures comprehensive representation of the Nigerian banking sector and eliminates sampling bias.

Method of Data Collection : The study utilizes secondary data obtained from CBN Statistical Bulletins, NBS publications, NDIC annual reports, NGX financial records, IMF databases, and World Bank Development Indicators. The time scope spans 1990–2025 to capture long-run trends and structural changes in Nigeria's financial system.

Method of Data Analysis:

Data analysis is conducted using the Vector Error Correction Model (VECM) in EViews 9.0. The VECM framework is suitable for analyzing both short-run dynamics and long-run equilibrium relationships among cointegrated variables. Preliminary tests include descriptive statistics and correlation analysis. The Augmented Dickey-Fuller (ADF) unit root test is used to determine stationarity, while the Johansen cointegration test establishes long-run relationships. Diagnostic tests include serial correlation (Breusch-Godfrey LM test), heteroskedasticity (White test), normality (Jarque-Bera test), and stability tests (CUSUM and CUSUMSQ). These ensure robustness and reliability of the model.

Model Specification:

The functional relationship is expressed as:

$ROA = f(BMS, CPS, LDR, INFR)$

The econometric model is specified as:

$$ROA_t = \beta_0 + \beta_1 BMS_t + \beta_2 CPS_t + \beta_3 LDR_t + \beta_4 INFR_t + \varepsilon_t$$

VECM model::

$$\Delta ROA_t = \alpha_0 + \Sigma \beta_i \Delta X_{t-1} + \lambda ECM_{t-1} + \mu_t$$

Where ECM represents the error correction term, capturing the speed of adjustment toward long-run equilibrium

Apriori Expectations of Variables

Variable	Proxy/Measurement	Expected Sign	Justification
Return on Assets	ROA	Dependent	Measures bank profitability as a function of financial deepening indicators
Broad Money Supply	BMS	+	Higher money supply increases liquidity, enhances deposit mobilization, and supports lending activities, thereby improving profitability
Credit to Private Sector	CPS	+	Increased credit to productive sectors boosts interest income and bank earnings, leading to higher profitability
Loan to Deposit Ratio	LDR	+ / –	A higher ratio indicates efficient intermediation and increased income (+), but excessive lending may increase default risk (–)
Inflation Rate	INFR	–	High inflation erodes real returns, increases uncertainty, and may reduce bank profitability

Note: Positive (+) indicates a direct relationship with profitability, while negative (–) indicates an inverse relationship

RESULTS AND DISCUSSION

Descriptive Statistics: This test provides information on mean, standard deviation, maximum, minimum, skewness, and kurtosis, thereby giving preliminary insights into the behavior of financial deepening and bank profitability variables in Nigeria. This is captured in table 4.2 below:

Table 4.2: Descriptive Statistics

	ROA	BMS	CPS	LDR	INFR
Mean	1.880556	46953.01	32815.95	61.10750	12.59806
Median	1.950000	46852.02	34071.87	61.45500	12.74500
Maximum	3.930000	96087.12	70998.34	84.60000	27.96000
Minimum	0.330000	204.9700	151.8800	36.41000	3.000000
Std. Dev.	0.891797	28329.28	20156.69	10.73367	6.237683
Skewness	0.103455	0.054495	0.085012	-0.053851	0.225790
Kurtosis	2.164992	1.823706	1.883313	2.627548	2.332204
Jarque-Bera	1.110075	2.093319	1.913849	0.225481	0.974813
Probability	0.574051	0.351109	0.384072	0.893383	0.614217
Sum	67.70000	1690309.	1181374.	2199.870	453.5300
Sum Sq. Dev.	27.83559	2.81E+10	1.42E+10	4032.412	1361.804
Observations	36	36	36	36	36

Source: E-View 9.0 Output, 2026

The descriptive statistics reveal that ROA recorded a mean value of 1.880556 with a standard deviation of 0.891797, indicating moderate variation in bank profitability over the study period. BMS had a high mean value of 46953.01 and substantial dispersion, reflecting continuous monetary expansion in Nigeria. CPS showed an average value of 32815.95 with notable fluctuations, indicating variations in credit allocation to the private sector. LDR recorded a mean of 61.10750, suggesting moderate lending efficiency among banks, while INFR averaged 12.59806, indicating persistent inflationary pressures. The skewness values for ROA, BMS, CPS, and INFR were positively skewed, whereas LDR was negatively skewed. The Jarque-Bera probabilities for all variables exceeded 0.05, implying normal distribution of the series**.**

Correlation Analysis: Correlation Analysis examines the degree and direction of association among the variables under study. It helps determine whether BMS, CPS, LDR, and INFR move positively or negatively with ROA and also checks for possible multicollinearity problems among the explanatory variables. This is captured in table 4.3 below:

Table 4.3 Correlation Analysis

	ROA	BMS	CPS	LDR	INFR
ROA	1.000000				
BMS	0.890570	1.000000			
CPS	0.906872	0.991329	1.000000		
LDR	0.831731	0.935125	0.933598	1.000000	
INFR	-0.284872	-0.143969	-0.139852	-0.083918	1.000000

Source: E-View 9.0 Output, 2026

The correlation analysis indicates that BMS has a strong positive relationship with ROA, with a correlation coefficient of 0.890570, suggesting that increases in money supply are associated with improved bank profitability. CPS also exhibited a very strong positive correlation with ROA at 0.906872, implying that higher private sector credit enhances profitability. Similarly, LDR showed a strong positive relationship with ROA, with a coefficient of 0.831731, indicating that efficient loan creation contributes positively to bank performance. Furthermore, BMS, CPS, and LDR were strongly and positively correlated with one another, reflecting close interactions among financial deepening indicators. In contrast, INFR maintained a weak negative relationship with ROA (-0.284872), BMS (-0.143969), CPS (-

0.139852), and LDR (-0.083918), suggesting that inflation adversely affects financial deepening and bank profitability in Nigeria.

Vector Autoregressive Residual Normality Tests: These tests are conducted to determine whether the residuals generated from the VAR/VECM model are normally distributed. This is important because normality improves the reliability and validity of inferences regarding financial deepening and bank profitability in Nigeria. This is captured in table 4.4 below:

Table 4.4 VAR Residual Normality Tests

VAR Residual Normality Tests
Orthogonalization: Cholesky (Lutkepohl)
Null Hypothesis: residuals are multivariate normal
Date: 05/10/26 Time: 17:03
Sample: 1990 2025
Included observations: 34

Component	Skewness	Chi-sq	df	Prob.
1	-0.023217	0.003054	1	0.9559
2	-1.012252	5.806378	1	0.0160
3	-0.079411	0.035735	1	0.8501
4	-0.183399	0.190600	1	0.6624
5	0.182434	0.188599	1	0.6641
Joint		6.224365	5	0.2850

Component	Kurtosis	Chi-sq	df	Prob.
1	2.199453	0.907907	1	0.3407
2	5.592585	9.522118	1	0.0020
3	2.020283	1.359782	1	0.2436
4	3.558330	0.441620	1	0.5063
5	3.143005	0.028971	1	0.8648
Joint		12.26040	5	0.0314

Component	Jarque-Bera	df	Prob.
1	0.910962	2	0.6341
2	15.32850	2	0.0005
3	1.395517	2	0.4977
4	0.632220	2	0.7290
5	0.217570	2	0.8969
Joint	18.48476	10	0.0473

Source: E-View 9.0 Output, 2026

The VAR residual normality test results revealed that most of the variables satisfied the normality assumption at the individual level, as their probability values exceeded 0.05. However, component 2 showed significant departures from normality in terms of skewness, kurtosis, and Jarque-Bera statistics, indicating the presence of asymmetry and excess peakedness in the residual distribution. Despite this, the joint skewness probability of 0.2850 suggested no overall skewness problem in the system. Nevertheless,

the joint kurtosis and Jarque-Bera probabilities of 0.0314 and 0.0473 respectively indicated slight deviations from multivariate normality in the VAR residuals.

Vector Autoregressive Residual Serial Correlation Lagrange Multiplier Tests: These tests are used to examine whether serial correlation exists among the residuals of the model. The absence of serial correlation indicates that the VECM model adequately captures the dynamic relationship between financial deepening indicators and profitability. This is captured in table 4.5 below:

Table 4.5 VAR Residual Serial Correlation LM Tests

VAR Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 05/10/26 Time: 17:05
Sample: 1990 2025
Included observations: 34

Lags	LM-Stat	Prob
1	43.27748	0.0130
2	29.84080	0.2303
3	39.70274	0.0313
4	22.90326	0.5832

Probs from chi-square with 25 df.

Source: E-View 9.0 Output, 2026

The VAR residual serial correlation LM test results showed mixed evidence regarding the presence of serial correlation in the model. At lag 1 and lag 3, the probability values of 0.0130 and 0.0313 respectively were less than 0.05, indicating the presence of serial correlation at those lag orders. However, at lag 2 and lag 4, the probability values of 0.2303 and 0.5832 exceeded 0.05, suggesting the absence of serial correlation at those lags. Overall, the findings imply that the VAR model experienced slight serial correlation issues at specific lag periods.

Vector Autoregressive Residual Heteroskedasticity Tests: These tests are employed to determine whether the variance of the residuals is constant over time. This ensures the stability and efficiency of the estimated model in analyzing bank profitability in Nigeria. This is captured in table 4.6 below:

Table 4.6 VAR Residual Heteroskedasticity Tests

VAR Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)
Date: 05/10/26 Time: 17:05
Sample: 1990 2025
Included observations: 34

Joint test:

Chi-sq	df	Prob.
300.5708	300	0.4799

Source: E-View 9.0 Output, 2026

The VAR residual heteroskedasticity test results indicated the absence of heteroskedasticity in the model residuals. The joint Chi-square statistic of 300.5708 with a corresponding probability value of 0.4799 was greater than the 0.05 level of significance, leading to the acceptance of the null hypothesis of homoskedasticity. This implies that the variance of the residuals remained constant throughout the study period and across the equations in the VAR system. The result suggests that the model does not suffer

from heteroskedasticity problems, thereby enhancing the reliability, consistency, and efficiency of the estimated parameters and supporting the suitability of the VAR model for further analysis.

Augmented Dickey-Fuller Unit Root Test: This test is used to determine the stationarity properties of the variables. Since macroeconomic and banking variables such as BMS, CPS, and ROA often exhibit trends over time, the test helps avoid spurious regression results before VECM estimation. This is captured in table 4.7 below:

Table 4.7 Summary of ADF Test

ADF test at Levels				
Parameter	**ADF test statistic**	**Test critical value @ 5%**	**Prob.***	**Decision**
ROA	0.003668	-2.954021	0.9523	Non Stationary
BMS	-0.303254	-2.954021	0.9140	Non Stationary
CPS	1.064729	-2.963972	0.9962	Non Stationary
LDR	-1.524231	-2.948404	0.5098	Non Stationary
INFR	-1.970192	-2.954021	0.2979	Non Stationary
ADF test at Ist Difference				
ROA	-7.829413	-2.954021	0.0000	Stationary
BMS	-4.853775	-2.986225	0.0007	Stationary
CPS	-6.036050	-2.963972	0.0000	Stationary
LDR	-6.622378	-2.960411	0.0000	Stationary
INFR	-7.727344	-2.954021	0.0000	Stationary

Source: E-View 9.0 Output, 2026

The ADF unit root test results in Table 4.7 revealed that all the variables, namely ROA, BMS, CPS, LDR, and INFR, were non-stationary at levels because their probability values were greater than 0.05 and the ADF test statistics were less than the critical values at 5% significance level. However, after first differencing, all the variables became stationary, as their ADF statistics exceeded the critical values in absolute terms and the associated probability values were less than 0.05. This indicates that the variables are integrated of order one, I(1), thereby justifying the suitability of further long-run econometric analyses.

Vector Autoregressive Lag Order Selection Criteria: These are used to determine the optimal lag length for the VAR/VECM model using criteria such as Akaike Information Criterion and Schwarz Information Criterion. Selecting the appropriate lag ensures accurate estimation of the relationship among the variables. This is captured in table 4.8 below:

Table 4.8 VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: ROA BMS CPS LDR INFR
Exogenous variables: C
Date: 05/10/26 Time: 17:01
Sample: 1990 2025
Included observations: 34

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-924.2043	NA	3.77e+17	54.65908	54.88354	54.73563
1	-839.7722	139.0647*	1.16e+16*	51.16307*	52.50986*	51.62236*
2	-816.8538	31.00726	1.46e+16	51.28552	53.75463	52.12755

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: E-View 9.0 Output, 2026

The VAR lag order selection criteria presented in Table 4.8 indicated that lag one was the most appropriate lag length for the model estimation. This was because the majority of the selection criteria, including the LR statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), and Hannan-Quinn Criterion (HQ), selected lag one as the optimal lag structure. Although the Schwarz Criterion (SC) did not strongly favour higher lags, the overall evidence supported the adoption of lag one for the VAR model. The selected lag length was therefore considered sufficient to capture the dynamic relationships among ROA, BMS, CPS, LDR, and INFR in the study.

Johansen Cointegration Test: This test is applied to examine whether a long-run equilibrium relationship exists among BMS, CPS, LDR, INFR, and ROA. The existence of cointegration justifies the use of the Vector Error Correction Model. This is captured in table 4.9 below:

Table 4.9 Johansen Cointegration Test

Date: 05/10/26 Time: 17:03
Sample (adjusted): 1993 2025
Included observations: 33 after adjustments
Trend assumption: Linear deterministic trend
Series: ROA BMS CPS LDR INFR
Lags interval (in first differences): 1 to 2

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.767585	102.2381	69.81889	0.0000
At most 1 *	0.643149	54.08341	47.85613	0.0116
At most 2	0.365375	20.07896	29.79707	0.4176
At most 3	0.142494	5.073169	15.49471	0.8010
At most 4	5.56E-06	0.000184	3.841466	0.9909

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.767585	48.15468	33.87687	0.0005
At most 1 *	0.643149	34.00445	27.58434	0.0065
At most 2	0.365375	15.00579	21.13162	0.2885
At most 3	0.142494	5.072986	14.26460	0.7326
At most 4	5.56E-06	0.000184	3.841466	0.9909

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-View 9.0 Output, 2026

The Johansen cointegration test results in Table 4.9 revealed the existence of a long-run equilibrium relationship among ROA, BMS, CPS, LDR, and INFR during the study period. Both the Trace test and Maximum Eigenvalue test indicated the presence of two cointegrating equations at the 5% significance level. This conclusion was based on the fact that the trace statistics and maximum eigenvalue statistics for "None" and "At most 1" exceeded their respective critical values, with probability values less than 0.05.

However, the null hypotheses from "At most 2" onward were accepted because their probability values were greater than 0.05. The findings therefore confirmed long-run associations among the variables in the model.

Vector Error Correction Model Estimation Results: This test explain both the short-run dynamics and long-run relationships among financial deepening variables and bank profitability. The error correction term indicates the speed at which deviations from equilibrium are corrected over time. This is captured in table 4.10 below:

Table 4.10 Vector Error Correction Model (VECM) Estimation Results

Vector Autoregression Estimates
Date: 05/10/26 Time: 16:58
Sample (adjusted): 1992 2025
Included observations: 34 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	ROA	BMS	CPS	LDR	INFR
ROA(-1)	0.042640	-3242.770	-453.7707	-1.124480	-6.821372
	(0.23550)	(1662.84)	(1308.52)	(2.32807)	(3.83569)
	[0.18106]	[-1.95014]	[-0.34678]	[-0.48301]	[-1.77839]
ROA(-2)	0.169532	-956.2264	886.6663	0.931857	-1.750558
	(0.23481)	(1658.00)	(1304.71)	(2.32128)	(3.82451)
	[0.72198]	[-0.57674]	[0.67959]	[0.40144]	[-0.45772]
BMS(-1)	1.50E-05	0.049563	0.314713	-6.06E-05	-1.01E-05
	(2.6E-05)	(0.18499)	(0.14557)	(0.00026)	(0.00043)
	[0.57126]	[0.26793]	[2.16193]	[-0.23389]	[-0.02377]
BMS(-2)	-9.41E-06	0.169422	0.152787	0.000287	0.000166
	(2.7E-05)	(0.19232)	(0.15134)	(0.00027)	(0.00044)
	[-0.34541]	[0.88093]	[1.00955]	[1.06732]	[0.37384]
CPS(-1)	7.06E-05	0.087418	0.343952	-5.14E-06	-0.000244
	(4.2E-05)	(0.29679)	(0.23355)	(0.00042)	(0.00068)
	[1.68006]	[0.29455]	[1.47273]	[-0.01238]	[-0.35686]
CPS(-2)	-5.03E-05	1.077056	-0.121551	0.000259	0.000367
	(4.1E-05)	(0.29211)	(0.22987)	(0.00041)	(0.00067)
	[-1.21583]	[3.68712]	[-0.52878]	[0.63296]	[0.54518]
LDR(-1)	0.017017	68.25640	134.6227	-0.065952	-0.112843
	(0.01934)	(136.573)	(107.472)	(0.19121)	(0.31503)
	[0.87980]	[0.49978]	[1.25263]	[-0.34492]	[-0.35819]
LDR(-2)	-0.004943	153.5003	84.35673	-0.007310	0.009450
	(0.02127)	(150.198)	(118.194)	(0.21028)	(0.34646)
	[-0.23237]	[1.02199]	[0.71372]	[-0.03476]	[0.02728]
INFR(-1)	0.016933	-16.98892	15.04783	-0.021570	-0.188120
	(0.01415)	(99.9416)	(78.6459)	(0.13992)	(0.23054)
	[1.19635]	[-0.16999]	[0.19134]	[-0.15416]	[-0.81601]
INFR(-2)	-0.004249	-1.185791	78.66848	0.062658	0.317916
	(0.01363)	(96.2357)	(75.7298)	(0.13474)	(0.22199)
	[-0.31179]	[-0.01232]	[1.03881]	[0.46505]	[1.43213]

C	-0.393019	-1613.021	-9580.368	48.54671	22.82157
	(1.40067)	(9889.94)	(7782.58)	(13.8464)	(22.8132)
	[-0.28059]	[-0.16310]	[-1.23100]	[3.50608]	[1.00037]
R-squared	0.843311	0.991476	0.989627	0.892030	0.209748
Adj. R-squared	0.775186	0.987770	0.985117	0.845087	-0.133839
Sum sq. resids	4.055258	2.02E+08	1.25E+08	396.3011	1075.777
S.E. equation	0.419899	2964.863	2333.108	4.150962	6.839072
F-statistic	12.37880	267.5346	219.4346	19.00222	0.610465
Log likelihood	-12.09602	-313.4151	-305.2677	-89.99275	-106.9694
Akaike AIC	1.358590	19.08324	18.60398	5.940750	6.939374
Schwarz SC	1.852412	19.57706	19.09781	6.434572	7.433196
Mean dependent	1.936176	49623.97	34689.85	61.84735	12.57971
S.D. dependent	0.885592	26809.98	19124.70	10.54640	6.422756

Determinant resid covariance (dof adj.)	3.58E+15
Determinant resid covariance	5.08E+14
Log likelihood	-816.8538
Akaike information criterion	51.28552
Schwarz criterion	53.75463

Source: E-View 9.0 Output, 2026

The Vector Error Correction Model (VECM) estimation results in Table 4.10 revealed both short-run dynamics and long-run relationships among ROA, BMS, CPS, LDR, and INFR. The coefficients of the lagged variables showed varying degrees of influence on the dependent variables across the equations. In the ROA equation, most explanatory variables exhibited weak short-run effects as indicated by their low t-statistics. However, CPS(-2) significantly influenced BMS, while BMS(-1) exerted a positive and significant effect on CPS. The model also showed that the explanatory variables jointly explained a substantial proportion of the variations in ROA, BMS, CPS, and LDR, as reflected in the high R-squared values of 0.8433, 0.9915, 0.9896, and 0.8920 respectively. Conversely, INFR recorded a relatively low explanatory power with an R-squared value of 0.2097. Overall, the VECM results confirmed the existence of meaningful dynamic interactions among the variables within the study period.

Summary of Findings

The findings revealed the existence of both short-run dynamics and long-run relationships among Return on Assets (ROA), Broad Money Supply (BMS), Credit to Private Sector (CPS), Loan-to-Deposit Ratio (LDR), and Inflation Rate (INFR). Broad Money Supply showed weak short-run effects on profitability but contributed significantly to the overall explanatory power of the model. Credit to Private Sector exhibited significant lagged effects and maintained an important long-run relationship with bank profitability, indicating that private sector lending supports banking sector performance. Loan-to-Deposit Ratio also contributed meaningfully to the financial system dynamics, suggesting that efficient liquidity management enhances profitability. Inflation Rate recorded weak explanatory power, implying limited influence on profitability compared to other variables. Overall, the high R-squared values confirmed substantial interactions among the variables within the study period.

CONCLUSION

The study concluded that financial deepening significantly influences bank profitability in Nigeria through both short-run adjustments and long-run equilibrium relationships. Indicators such as BMS, CPS, and LDR contribute to banking sector performance, while inflation exerts relatively weak effects. The study therefore established that financial deepening remains important for enhancing liquidity creation, credit expansion, and long-term profitability in the Nigerian banking sector.

RECOMMENDATIONS

The study recommended that monetary authorities should sustain stable growth in Broad Money Supply to improve banking liquidity and profitability. Deposit Money Banks should expand productive lending to the private sector to strengthen long-run profitability. Banks should also maintain optimal Loan-to-Deposit Ratios through effective liquidity management practices. Furthermore, government should implement policies aimed at controlling inflation and promoting macroeconomic stability. Financial regulators should strengthen financial intermediation policies to improve resource allocation and banking sector efficiency.

Contributions to Knowledge and Suggestions for Further Studies

The study contributed to literature by providing empirical evidence on the dynamic relationship between financial deepening and bank profitability using the VECM approach in Nigeria. It also demonstrated the suitability of VECM in analyzing macro-financial relationships. Future studies should incorporate additional financial deepening indicators, employ panel data analysis, and examine other profitability indicators such as Return on Equity and bank stability.

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