
Effect of Leading Macroeconomic Variables on the Financial Performance of Deposit Money Banks in Nigeria

Nwala N. M, Mairafi, S. L and ECHE Ochoche
DEPARTMENT OF BANKING AND FINANCE
FACULTY OF ADMINISTRATION
Nasarawa State University Keffi, Nigeria.

doi.org/10.51505/IJEBMR.2024.81011 URL: <https://doi.org/10.51505/IJEBMR.2024.81011>

Received: Jun 11, 2024

Accepted: Jun 19, 2024

Online Published: Oct 13, 2024

Abstract

This study examined the leading macroeconomic variables on financial performance of deposit money banks in Nigeria. Specifically, the study sought to determine the effect of stock market index and money supply on return on assets of deposit money banks in Nigeria. Ex post Facto research design was adopted to carry out the research work. The study employed quarterly time series data from the period of 2010 to 2022. The secondary data were obtained from the Central bank of Nigeria Statistical bulletin (2022). The study adopted descriptive statistics, unit root test, co-integration test and Autoregressive Descriptive Lag (ARDL) to establish the effect of leading macroeconomic variables on financial performance of deposit money banks in Nigeria. The result of Johansen co integration shows that there was an indication of co integration at 0.05 significance level. With the aid of ARDL analysis, stock market index had a significant effect on the financial performance of deposit money banks in Nigeria. Money supply also had a significant effect on the financial performance of deposit money banks in Nigeria. The study suggested that the SEC take into account lowering barriers to stock market liquidity. Reducing barriers to foreign capital flows and fostering an atmosphere that encourages investors to transfer money from the money market to the capital market in order to increase market capitalization would improve bank performance. By lowering interest rates, the CBN should raise the money supply through monetary policy. This would encourage investment and put more money in depositors' hands, which will boost spending and improve bank financial performance.

Keywords: Leading Macroeconomic variables, Stock market index, Money supply, financial performance.

Introduction

Banks play a crucial role in the economic advancement of a nation. Apart from serving as financial intermediaries, they are essential sources of funding for businesses. These banks play a vital role in efficiently allocating resources by channeling funds into productive activities. This process involves transferring surplus funds from individuals to those who require capital for productive ventures, ultimately stimulating investments and fostering economic growth and development. Conversely, if banks fail in their intermediary function, it can lead to a decline in economic growth and development. The repercussions of poor banking performance include

bank failures and financial crises, as seen during the global financial crisis in 2007. Some scholars have suggested that the collapse of a large bank could have more severe consequences than that of any other institution within the economy (Alsharif, 2021).

Leading macroeconomic variables forecast the changes in the economy before the changes actually occur. This is often used by governments to implement policies because they represent the first phase of a new economic cycle in order to boost the performance of banks. Investors can use leading macroeconomic variables to make investment decisions by using them to anticipate future economic trends. Leading macroeconomic variables such as the stock market performance, house prices, bond yields, interest rates statistics, retail sales, and money supply can provide insight into the potential direction of the economy. By analyzing these indicators, investors can make informed decisions about asset allocation, timing of investments, and overall investment strategies. Additionally, leading indicators can help investors identify potential opportunities and risks in the market, allowing them to adjust their portfolios accordingly (Egbunike & Okerekeoti, 2018)

Financial performance in the banking industry plays a very crucial role towards achieving sustainable and sound financial performance in any nation. Financial performance is measured by the return on assets (ROA). The return on assets of Nigerian banks fell from 2.7% in 2019 to 2.3% in 2020 and from 2.3 2020 to 1.32% in 2021 and from 1.32% in 2021 to 2.190% 2022. This is a sign that the Nigerian banks performance has declined in recent years. It serves as a vital measure of the success of a bank's operational conditions. Examining banks financial performance can be done from both micro and macro perspectives. At the micro level, within a competitive environment, banks must strive to perform well in all their operational activities to thrive and grow. On the macro level, good financial performance in the banking industry can impact financial intermediation costs and contribute to overall financial system stability. This is because banks play a crucial role as intermediaries and providers of financial services. Good financial performance in the banking sector can lead to better allocation of financial resources, ultimately promoting investment activities and economic growth (Aburime, 2019).

Failures in financial institutions, particularly banks, may result from changes in certain leading macroeconomic factors. A key driver of banks' competitiveness is their ability to innovate, leading to variations in performance based on their unique features and advantages. On the other hand, all banks face the same financial and macroeconomic conditions. Favorable macroeconomic conditions can boost the performance of the deposit money banks, while unfavorable conditions can lead to poor performance of deposit money banks. This underscores the significance of macroeconomic stability for the smooth functioning of the banking system (Adegboyo, 2019).

The Nigerian economy has been subjected to numerous changes in its macroeconomic environment, influenced by dynamic global trends resulting in continuous fluctuations in macroeconomic variables. These shifts in macroeconomic variables no doubt would have had a substantial impact on the financial performance of deposit money banks in Nigeria which serves

as a crucial financial intermediary in the country's economic development and stability. While it is anticipated that these variations in macroeconomic variables of stock market index and money supply would enhance financial performance of deposit money banks, there exists a divergence of perspectives among scholars regarding this expectation (Hassan& Oyedele, 2022).

This study was built on a model that captures leading macroeconomic variables which predicts the future economic trends and the reality of the Nigerian banking sector and thus contributes to knowledge for future studies. Given the fact that there is yet not a consensus as to whether leading macroeconomic variables have a force to bear on the financial performance of deposit money banks in the Nigerian economy, the thrust of this study will be to examine the effect of leading macroeconomic variables on the financial performance of deposit money banks in Nigeria. In line with the objectives of the research the following hypotheses were formulated to be tested.

H₀₁: Stock market index has no significant effect on financial performance of deposit money banks in Nigeria

H₀₂: Money supply has no significant effect on financial performance of deposit money banks in Nigeria.

Literature Review

Concept of Leading Macroeconomic Variables

Leading macroeconomic variables, also known as leading indicators, are statistics or data that provide insight into the future direction of the economy(Akinlo & Gbenga, 2021). The foundation of economic policy remains to be macroeconomic stability. Macroeconomic issues, according to Abdullateef and Waheed (2010), have an impact on the economy as a whole as opposed to simply one specific sector. Additionally, they described macroeconomic variables as the primary indicators or signposts indicating the prevailing economic patterns. Like all professionals, the government needs to research, evaluate, and comprehend the key factors influencing the economy's present behavior in order to manage it macro economically. Macroeconomic variables are related to economic aggregates, such as a nation, a region, its people, and all of its businesses. For instance, a nation's total production consists of the output of all of its public sector, enterprises, families, and people. According to Solomon and Eka (2013), macroeconomic variables are traits, trends, or circumstances that are related to or originate from a broader segment of an economy as opposed to a specific population. A notable economic, environmental, or geopolitical event that has a substantial impact on the regional or national economy might be the characteristic.

Stock Market Index

The stock market or equity market is a place where shares of publicly held companies are issued and traded either through exchanges. It is a place where people with surplus capital transfer such to those with deficit capital for capital appreciation or reward of dividend. According to Sharma (2018), One of the most important elements of a free-market economy is the stock market, which gives businesses access to cash in return for offering investors a stake in the business. "Living up to one's potential through the stock market allows one to accumulate wealth without having to

take on the risks associated with starting a business or giving up certain perks of a high-paying job” (Alsharif, 2021).

Through the stock market, investors may share in the profits made by the businesses whose shares they own. Stock market investors earn from prosperous firms when they sell valued equities for a capital gain as well as from the dividends the companies pay out. The drawback is that investors may suffer financial losses if the businesses they buy stocks in experience financial difficulties, causing the stocks' values to drop and the investor to sell the stocks at a loss (Adepoju, 2013).

Money Supply

The non-bank sector's coin and note holdings are referred to as the M0 type of money supply. It is computed by deducting the total amount of risk banknotes and coins in circulation from the notes and coins held by banks. It is often believed that higher money supply will result in higher stock values. A growing money supply boosts the economy and makes more credit available to businesses so they may increase production, which in turn boosts sales and boosts their profits. (Et al., Muhoho, 2019). Better dividend payments for businesses as a result raise the price of stocks. Money supply, however, may also have a negative relationship with stock prices. In order to support this claim, we first examine the relationship between the money supply and inflation (19). Specifically, we find that an increase in the money supply is positively correlated with inflation in the economy, which raises the nominal risk-free rate. The discount rate will rise as a result of this increase in the nominal risk-free rate, which will lower return. In this study, a link between the money supply and bank performance is anticipated (Hassan & Oyedele, 2022).

Concept of Financial Performance

Determining specific characteristics that might gauge a bank's ability to turn a profit is known as financial performance. The accomplishments of the business as evidenced by its financial statements provide insight into the status of the business over a specific time frame and are referred to as the business's financial performance (Sharma & Sharma, 2015). A bank's financial performance may be seen as an indicator of its growth, prospects for the future, and possibilities for positive development. To estimate the output capacity of current resources and to evaluate prospective changes in economic resources that may be controlled in the future, financial performance data is required.

Performance measurement, according to Samarasinghe (2023), is a means of making sure that the resources provided are used as effectively and efficiently as possible. The main goal is to give the organization the highest possible return on the cash invested in the enterprise. This is a broad indicator of a company's overall financial health during a certain time period. It may be used to aggregately compare industries or sectors or to compare similar companies within the same industry. Financial success can be measured in a variety of ways, but all metrics should be combined. Using ratios is one method managers use to keep an eye on an organization's financial matters(Hassan & Oyedele, 2022).

Empirical Review

Stock Market Index and Financial Performance

Samarasinghe (2023). investigated a favorable correlation exists between bank soundness and stock market liquidity at the systemic and bank levels. In order to quantify bank and systemic stability, this article uses the Z-score (Z_SCORE), Non-Performing Loans (NPL), Loan Loss Provisions (LLP), Marginal Expected Shortfall (MES), and the SRISK measure. This study conducts analyses utilizing both the individual and systemic aspects of bank risk, whereas the majority of previous research on bank stability exclusively concentrate on accounting-based individual risk metrics. The ratio of non-performing loans to gross loans is represented by Non-Performing Loans (NPL), while the ratio of loan loss provisions to gross loans is represented by Loan Loss Provisions (LLP). The diversification channel, which proposed that banks expand into other non-traditional businesses as stock market liquidity rises, so boosting their stability, is the pertinent economic channel. These consequences are more pronounced for banks that operate in developed nations and, moreover, for banks that operate in markets where players enjoy higher degrees of protection. These findings hold up well to several testing and have significant policy and practical consequences. Nevertheless, there was no indication of a robustness test like the heteroskedascity test.

Alsharif(2021) investigated the Saudi Arabian banks' efficiency and how it relates to stock performance using six efficiency metrics (three pricing efficiencies and three technical efficiencies). The data envelopment analysis (DEA) on all listed Saudi commercial banks from 2006 to 2018 is utilized in this work to ensure the robustness of the findings. The influence of efficiency adjustments on bank stock returns is experimentally tested using the multiple-regression analysis approach. The findings showed that Saudi banks had more pricing volatility and more technical efficiency. Additionally, there is a positive correlation between changes in bank efficiency and stock performance. However, this correlation is only statistically significant when considering changes in profit and scale efficiency measures, which suggests that investors focus a great deal on the growth in bank profitability and potential dividend payments. The author failed to carryout appropriate empirical reviews in the body of the work. These reviews are necessary for research gaps identification.

Sharma (2018) examined the study in wealthy nations linking new aspects of stock performance to bank efficiency, there is not as much of it in developing nations. In view of this, a model is built and evaluated for the Indian economy, using the stock market return as the main variable along with bank efficiency and bank-specific variables. Data Envelopment Analysis (DEA) was used to construct the model specifically for Indian banks. Utilizing panel data regression analysis, the empirical relationship between efficiency metrics and market performance metrics was investigated. The findings of the regression analysis verified the existence of a statistically significant correlation between Indian banks' market performance and operational efficiency. Banks that are considered to be effective operate more efficiently, providing more value and returns to their stockholders. The Hausman test results provide the basis for using a panel data regression model, yet in this investigation, those results were not met. It appears the author just decided to use fixed-effect model without the pre-estimation test.

Sharma and Sharma (2015) using a non-parametric data envelopment analysis (DEA) based Malmquist productivity index (MPI) and panel data regression model, the direct effects of the US subprime crisis and unstable macroeconomic conditions on the productivity gains of the Indian banking industry were evaluated for the years 2000–2010. This research analyzes the productivity trend and measures the impact of the financial crisis, a volatile macroeconomic environment, and regulatory and microeconomic variables on the productivity of the Indian banking industry. The findings show that over the research period, overall productivity increased as a result of sector-wide technology advancements. The 2008–2009 financial crisis had a beneficial and notable effect on the productivity of the Indian banking industry. Based on empirical evidence, it appears that the banking sector in India maintained its productivity growth during the global financial crisis. The GDP and inflation show a strong and negative correlation with the productivity increases in the Indian banking industry. This analysis confirms the "market discipline" idea in the Indian banking sector since productivity development shows a strong and positive connection with stock exchange listing. The association between the bank's size in terms of total assets, diversification strategy, and profitability is negligible, whereas the bank's preference for expenses shows a negative relationship. Therefore, results of the study do not support global advantage hypothesis in Indian banking sector.

Adepoju (2013) studied the turbulent stock market performance of Nigerian commercial banks from 2007 to 2010. This study uses an ex post facto design to collect data through a survey. Eight banks were chosen for the sample, four from each of the first and new generations of banks, via a multi-stage sampling process that used purposive and stratified sampling methods. The stock market prices, or secondary data, were gathered from the Nigerian Stock Exchange activity list. One-Way ANOVA and trend analysis were both used in the data analysis. As a result, it was determined that all of the tested banks' stock market performance decreased, particularly starting around May 2008. The conclusion reached was that the risk that the climate posed to investment success may have led to investors losing faith in the possibility of future growth, which may have led them to sell some of their shares. Therefore, it was advised that when handling matters that might pose a danger to investment interests, the government and institutions in charge of managing the country's economy should take the initiative. The use of graphs and tabular form may not capture appropriately a robust analysis required for policy making, the author could have easily adopted a quantitative approach.

Adenuga(2010)investigated the connection between economic expansion and stock market development. This study used quarterly data for Nigeria from 1990:1 to 2009:4 to investigate the hypothesis that stock market development fosters economic growth in the country. The vector error correction model (VECM) technique was applied to the widely used stock market development indicators in order to test the validity of the hypothesis. Based on the results, the market capitalization ratio (mcr) model and the total value of shares traded ratio model fit the data the best, while the turnover ratio model underperformed. The coefficient of the error correction term ECM (-1) contains the predicted negative sign and is extremely significant at the 1.0 percent level, according to the results. During the analysis period, the model supports the premise that Nigeria's stock market stimulates economic development. At one percent, the total

model fit is substantial, as indicated by the F-test result of 10.88. Comparably, the vr model demonstrates that the ECM (-1) is substantial at 1.0 percent and has the predicted negative sign. The model supports the hypothesis that there is a direct correlation between Nigeria's economic development over the analysis period and stock market indices. At one percent, the total model fit is substantial, as indicated by the F-test score of 13.39. The time series data was not subjected to preliminary tests such as unit root test, which could lead to spurious regression.

Money Supply and Financial Performance

Hassan and Oyedele (2022) studied the impact of the money supply between 2008 and 2020 on the financial performance of deposit money banks listed in Nigeria. The ten (10) deposit money banks that were listed on the Nigerian stock market as of December 31, 2020, make up the sample size. The annual reports of the institutions that were sampled provided the panel data. The results of the analysis of the data using Pooled Ordinary Least Square multiple regression indicated that the money supply significantly influences financial performance in a positive way, the inflation rate significantly affects financial performance in a negative way, and the interest rate significantly affects the financial performance of the sample banks in a negative way. The study found that monetary policy has a significant impact on how well Nigerian banks function financially. However, the authors failed to tie the findings made in the study to empirical reviews because appropriate empirical studies were not conducted in the study.

Olofinlade et al (2020) examined, over a 35-year period from 1984 to 2018, the impact of monetary policy on bank lending and economic performance in Nigeria. The real gross domestic product was regressed as a measure of economic success, and the study focused on the broad money supply, inflation rate, prime lending rate, and monetary policy rate as monetary policy indicators. The National Bureau of Statistics and the Nigeria Central Bank Statistical Bulletin provided the data. Two models were used in the study to examine how monetary policy affects bank lending and economic performance, respectively. Regression analysis and the Augmented Dickey Fuller (ADF) stationarity test were used as estimate approaches. Based on data from model one, bank lending is significantly influenced by the money supply and the rate of inflation, however bank lending is not significantly influenced by the monetary policy rate. According to the results of the second model, the money supply significantly affects economic performance, whereas the prime lending rate, the rate of monetary policy, and the rate of inflation have a negative and negligible impact over the research period. Nevertheless, the research showed no indication of a post-estimation test.

Muhoho et al (2019) used panel data for eleven (11) years from 2007 to 2017 utilizing panel regression analysis and a causal study methodology. Since all eleven (11) of Kenya's listed commercial banks made up the target population, it was indicated that a census had been conducted. The commercial banks' official websites containing their audited financial accounts and the CBK's official website including its statistics bulletins were the sources of the data. The study's findings revealed that the money supply had a considerable impact on performance, whereas the central bank rate and inflation had little bearing. The data was regressed using the random effect model. Additionally, the analysis showed that capital sufficiency significantly

moderated the link between inflation and the money supply, but it had no moderating effect on the relationship between the central bank rate and the money supply. Furthermore, the study found that money supply has a major impact on performance whereas central bank rate and inflation have little influence on financial performance in the absence of prudential supervision. Akomolafe et al (2015) investigated using a micro-panel analysis the effect of monetary policy on the performance of commercial banks in Nigeria. The money supply and interest rate were employed as stand-ins for monetary policy, and the success of commercial banks was gauged by profit before taxes, or PBT. The analysis used three different regression techniques: pooled, fixed, and random effects. The Hausman test does, however, indicate that fixed effect regression is the most suitable. The findings indicate that the money supply and interest rate, which serve as proxies for monetary policy, and bank profitability are positively correlated. At the 1% and 5% levels, the interest rate was not statistically significant, nevertheless. Much more pooled regression may have been employed by the author. Regression rather than panel data regression would have been the most appropriate for the investigation.

Otalu et al., (2014) carried out a study on Nigerian commercial banks' performance in relation to monetary policy: an evaluation of the role of credit creation. Interest rates, liquidity ratios, cash reserve ratios, and money supply served as monetary policy indicators, while total bank credit was used as a performance indicator. The study's conclusions demonstrate that the money supply has a major favorable impact on Nigeria's commercial banks' performance. Nonetheless, the study's focus was Nigeria, and its success was gauged by total bank credit.

Kwakwa (2014) carried a research on Ghanaian commercial banks' performance drivers. The study took into account how the money supply, inflation, and bank size affected Ghana's commercial banks' performance. Performance metrics for the banks were ROA and ROE. The study's conclusions demonstrate that the money supply significantly harmed Ghanaian commercial banks' profitability as shown by ROA and ROE (return on equity). But since the study's foundation was Ghana, its conclusions cannot be applied to other nations—in this case, Nigeria's commercial banks.

Theoretical Framework

Macroeconomic Theory

It was Friedman who first put this notion (1963). According to the hypothesis, interest rates rise when the money supply expands faster than actual growth. This is also the outcome of the Harberger (1963) model, which makes the assumption that prices in the money market respond to an excess of money supply. This presumption makes it easy to regulate interest rates and reverse the real money demand. Different market disequilibrium, including in the local money market, external/foreign markets, and labor market, are the cause of interest rate volatility in open economies. Therefore, there are three primary causes of rising interest rates: an abundance of money supply, rising international prices, and cost-push factors (Were et al., 2013).

Although the theory acknowledges other sources of interest rates, such as foreign prices and cost push factors, in addition to the money demand, it is tied to Keynesian liquidity preference theory.

The argument put forth by this theory's detractors is that it is improbable that governments will really carry out theoretically ideal policies. They said that the macroeconomic revolution was predicated on the implicit premise that savviness would prevail in economic policymaking, with disinterested economic technocrats serving as advisors and smart men operating independently of political chances or constraints. They said that this was an incorrect presumption on the conduct of politics, bureaucracy, and elections. Macroeconomic theory holds that rising money supply over actual growth is what drives interest rate increases, which is relevant to the subject. According to the idea, there are three primary drivers of interest rate volatility: the excess money supply, foreign exchange rates, and cost push factors. Different equilibria in a number of markets, including the labor market, external/foreign markets, and the local money market, will also contribute to interest rate volatility. Consequently, managing market disequilibrium will be necessary to reduce the volatility of interest rates.

Methodology

Ex post facto research design is the methodology used in this study. The analysis used quarterly data from 2010 to 2022 from the Central Bank of Nigeria Statistical Bulletin (2022). The methodology used in this study necessitates the use of unit root testing, auto regressive distribution lag (ARDL), and empirical analysis of descriptive statistics because it acknowledges that multiple factors, not just one, can influence or establish the effect of the leading macroeconomic variable on the financial performance of Nigerian banks. The following model was estimated.

$$ROA = f(SMI, MOS) \dots\dots\dots(1)$$

$$ROA_t = \alpha_0 + \alpha_1 SMI_t + \alpha_2 MOS_t + \mu_t \dots\dots\dots (2)$$

Where:

ROA = Return on Assets

SMI = Stock market index

MOS = Money supply

a = intercept (value of Y when X is zero)

e = Error term

Building equations (3) into an ARDL model was stated:

$$\Delta ROA_t = \mu + \alpha_1 ROA_{t-1} + \alpha_2 SMI_{t-1} + \alpha_3 MOS_{t-1} + \sum_{i=1}^{p-1} \lambda_1 \Delta ROA_{t-i} + \sum_{i=0}^{q-1} \lambda_2 \Delta SMI_{t-1} + \sum_{i=0}^{q-1} \lambda_3 \Delta MOS_{t-1} + \varepsilon_t \dots\dots\dots(3)$$

Results and Discussions

Table 1: Descriptive Statistics

	ROA	SMI	MOS
Mean	0.182367	4.498569	1.128682
Median	0.276462	4.512672	1.164353
Maximum	0.522444	4.714477	1.276002
Minimum	-0.920819	3.659687	0.906173
Std. Dev.	0.344618	0.153874	0.118307
Skewness	-1.464484	-3.149599	-0.566872
Kurtosis	4.361542	18.40294	1.968445
Jarque-Bera	22.16937	588.4774	4.992647
Probability	0.000015	0.000000	0.082387
Sum	9.300697	229.4270	57.56280
Sum Sq. Dev.	5.938093	1.183861	0.699829
Observations	52	52	52

Table 1 shows that, ROA, stock market index and money supply has mean value of 0.182367, 4.498569 and 1.128682 respectively, while deviation from the mean (standard deviation) was 0.344618, 0.153874 and 0.118307. The mean of ROA, stock market index and money supply were normally distributed because the standard deviation value was lower than the mean value. In like manner, ROA, stock market index and money supply had median of 0.276462, 4.512672 and 1.164353 with Jarque-Bera of 22.16937, 588.4774 and 4.992647 respectively.

Table 2: Correlation Matrix.

	ROA	SMI	MOS
ROA	1	0.037389623	0.244603447
SMI	0.03738962	1	0.029458493
MOS	0.24460344	0.029458493	1

Source: Eviews 10, 2024.

From table 2, it explained the relationship between leading macroeconomic variables and financial performance of deposit money banks in Nigeria where the ROA was correlated with stock market index to the extent of 0.03, while, ROA was correlated with money supply to the extent of 0.24. Also, stock market index was correlated with ROA to the extent of 0.03, while, stock market index was correlated with money supply to the extent of 0.02. Finally, money supply was correlated with ROA to the extent of 0.24, while, money supply was correlated with stock market index to the extent of 0.02. However, the correlation matrix result implies that none of the study's independent variables has multicollinearity.

Table 3: Summary of Unit Root Test Results

Variables	ADF Test Statistic	Order of Integration
ROA	-9.477195 (-3.592462)	<i>I(1)</i>
SMI	-6.118694 (-3.565430)	<i>I(0)</i>
MOS	-7.298502 (-3.571310)	<i>I(0)</i>

Source: Eviews 10, 2024

From the Table 3, it was discovered that ROA was found stationary at first difference, that is, at order I(1). It follows that their ADF test statistic was discovered to be higher than their threshold values. Additionally, Stock market index was discovered to be stationary at level, or at order I (0). It follows that their ADF test statistic was discovered to be higher than their threshold values. However, at order I, the first difference, the Money supply was found to be stationary at level I (0). It follows that their ADF test statistic was discovered to be higher than their threshold values. The long-term relationship between the variables was examined using the ARDL approach.

Table 4: Johansen Cointegration Test
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.372472	37.90702	29.79707	0.0047
At most 1 *	0.245785	16.00657	15.49471	0.0419
At most 2	0.056809	2.748884	3.841466	0.0973

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 *	0.372472	21.90046	21.13162	0.0389
At most 1	0.245785	13.25768	14.26460	0.0716
At most 2	0.056809	2.748884	3.841466	0.0973

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level

Source: Authors Computation, 2024

The result of Johansen cointegration shows that there is indication of cointegration at 0.05 significance level as shown in its trace statistics of None, At most 1 and At most 2 (16.00657 and 2.748884) are greater than their respective 0.05 critical values (15.49471 and 3.841466), while their p-values (0.00419 and 0.097) are all below the 0.05 level of significance for this study. Since there is a cointegration in the two criteria of Johansen cointegration test, it implies that there is a long run relationship between financial performance and the two variables of leading macroeconomics variables (stock market index and money supply) considered.

Table 5: ADRL Bounds Test

ARDL Bounds Test
Sample: 2002Q1 2022Q4

Test Statistic	Value	k
F-statistic	3.224301	2

Source: Authors Computation, 2024

Table 5 shows the result of the ADRL bound test for variables used in the study. The result rejects the null hypothesis if the F-calculated is less than the critical value for the upper bound 1(1) and vice versa. From this result, it can be seen that the F-statistics is greater than the critical values at 1(1) and as such, it is concluded that there is the presence of a long-run relationship among the variables.

Table 6: ADRL Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROA(-1))	0.542791	0.416516	1.303170	0.2151
D(ROA(-2))	0.096902	0.370716	0.261392	0.7979
D(ROA(-3))	-0.375737	0.303046	-1.239867	0.2369
D(SMI)	0.597675	0.415377	1.438875	0.1738
D(SMI (-1))	3.124508	1.984083	1.574787	0.1393
D(SMI (-2))	-2.736447	1.735049	-1.577158	0.1388
D(SMI(-3))	2.200412	1.548198	1.421273	0.0188
D(SMI (-4))	-7.066485	4.828966	-1.463354	0.1671
D(MOI)	-0.673406	4.793974	-0.140469	0.8904
D(MOI (-1))	-2.192233	4.680090	-0.468417	0.6472
D(MOI(-2))	3.724988	3.922841	-0.949564	0.3597
D(MOI(-3))	3.321852	4.039867	0.822268	0.4257
D(MOI(-4))	-11.33125	5.104700	-2.219768	0.0448
C	-19.29228	11.42158	-1.689108	0.1150
SMI(-1)	4.186658	2.562054	1.634102	0.0262
MOI(-1)	0.881728	0.857081	1.028757	0.0224

R-squared	0.879504	Mean dependent var	0.019076
Adjusted R-squared	0.857050	S.D. dependent var	0.492921
S.E. of regression	0.288664	Akaike info criterion	0.596046
Sum squared resid	1.083249	Schwarz criterion	1.673405
Log likelihood	13.67513	Hannan-Quinn criter.	0.979362
F-statistic	3.953638	Durbin-Watson stat	1.370374
Prob(F-statistic)	0.000428		

Source: Authors Computation, 2024

The ARDL result also reveal the explanatory power of the regression model with an r-squared of 87%. This indicates that 87% of the variation in financial performance (ROA) is explained by the independent variables of macroeconomics (stock market index and money supply). The remaining 13% is explained by variables outside this model. The Adjusted R² of 85% is close to the R² value of 87%, meaning that the model is fit and useful for making generalization within this period.

Test of Hypotheses

H₀₁: Stock market index has no significant effect on financial performance of deposit money banks in Nigeria.

Stock market index had a significant effect on financial performance of deposit money banks in Nigeria because the p-value was 0.0262 which was less than the 0.05 significant level, indicating that increase in stock market index will have an increase on financial performance of deposit money banks in Nigeria. The result of the study revealed a positive coefficient of 4.186658. This is significant at a 95% confidence level. As such, the study rejects the null hypothesis that stock market index had a significant effect on financial performance of deposit money banks in Nigeria.

H₀₂: Money supply has no significant effect on financial performance of deposit money banks in Nigeria.

Money supply had a significant effect on financial performance of deposit money banks in Nigeria because the p-value was 0.0224 which was less than the 0.05 significant level, indicating that increase in money supply will have an increase on financial performance of deposit money banks in Nigeria. The result of the study revealed a coefficient of 0.881728. This is significant at a 95% confidence level. As such, the study rejects the hypothesis that money supply has a significant effect on financial performance of deposit money banks in Nigeria.

Post Estimation Result

Table 6: Test for Heteroscedasticity
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.931195	Prob. F(24,13)	0.1088
Obs*R-squared	29.67631	Prob. Chi-Square(24)	0.1957
Scaled explained SS	4.153910	Prob. Chi-Square(24)	1.0000

Source: Authors Computation, 2024

When using the analysis, heteroscedasticity should be taken very seriously. Consequently, the first thing to do is find out if the error term's variance is constant. When the error term's variance is not constant—that is, when it fluctuates in response to changes in the values of the independent variables—heteroscedasticity arises. The purpose of the heteroscedasticity test is to determine if the model's residual variances vary between data (Ghozali, 2002). The Breusch-Pagan Godfrey test was employed in this investigation to assess heteroscedasticity. The absence of heteroscedasticity is the test's null hypothesis. Reject the null hypothesis and determine that the residuals are heteroscedastic if the p-value is more than five percent. The proper actions will be taken if heteroscedasticity is found. Breusch Pagan's Test was used to determine heteroscedasticity.

Heteroskedasticity basically means that the residuals' or term error's variance is not constant, which might have an impact on conclusions drawn about the study's F-statistic, coefficient of determination (R²), and beta coefficient. The findings suggest that heteroscedasticity is not a concern because the model's heteroscedasticity is implied by the F-statistics and related probability, which are negligible at 0.1293 and 0.1318, respectively.

Discussion of Findings

The results show that, at a 5% significant level, the stock market index had a substantial impact on the financial performance of deposit money banks in Nigeria. This suggests that an increase in the stock market index will also have a positive impact on the financial performance of Nigerian deposit money banks. These associations, however, were only statistically significant, and the changes in scale efficiency and profit indicators suggest that investors are particularly interested in bank profitability improvements and future dividend payments. Research works such as; Samarasinghe (2023), Alsharif (2021) and Sharma (2018), all support the findings of this study.

Furthermore, money supply had a significant effect on financial performance of deposit money banks in Nigeria at 5% significant level, indicating that an increase in money supply will have an increase on financial performance of deposit money banks in Nigeria. This work is in support with the findings of Olofinlade et al. (2020) Otalu et al (2016) and Hassan and Oyedele (2022).

Conclusion and Policy Recommendations

The study examined the effect of leading macroeconomic variables on financial performance of deposit money banks in Nigeria. From the findings, it is obvious that macroeconomic variables have a long-term significant effect on financial performance of deposit money banks in Nigeria.

Thus, when the economy is growing with leading macroeconomic variables, banks tend to perform better as there is more demand for loans and credit. On the other hand, when interest rates rise with low money supply, banks may experience a decline in demand for loans and credit, which can negatively impact their profitability. Therefore, investors who are interested in investing in the banking sector should pay attention to leading macroeconomic variables and their potential impact on bank performance.

Drawing from the research findings, the recommendations proffered are as follows:

- i. SEC need to think about removing obstacles that limit stock market liquidity. Reducing barriers to foreign capital flows and fostering an atmosphere that encourages investors to transfer money from the money market to the capital market in order to increase market capitalization would improve bank performance.
- ii. CBN through the monetary policy should increase money supply by reducing interest rates, which in turn generates more investment and puts more money in the hands of depositors, thereby stimulating spending and can enhance bank financial performance.

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Appendix

Year	Stock market index	Money Supply	Inflation Rate	Unemployment Rate	ROA
2010Q1	4.393935	1.137354	4.04277	1.324282	0.274158
2010Q2	4.375856	1.113952	4.053821	1.338456	0.274158
2010Q3	4.356992	1.089216	4.064597	1.352183	0.120574
2010Q4	4.337272	1.062986	4.075113	1.365488	-0.49485
2011Q1	4.316613	1.035069	4.085379	1.378398	0.424882
2011Q2	4.353487	1.048636	4.100463	1.378398	0.334454
2011Q3	4.387474	1.061792	4.11504	1.378398	0.396199
2011Q4	4.418993	1.07456	4.129143	1.378398	-0.55284
2012Q1	4.448379	1.086965	4.142803	1.378398	0.103804
2012Q2	4.496811	1.052376	4.152551	1.378852	-0.45593
2012Q3	4.54038	1.014793	4.162084	1.379306	0.298853
2012Q4	4.579973	0.973647	4.171413	1.379759	-0.14874
2013Q1	4.616257	0.928191	4.180546	1.380211	0.064458
2013Q2	4.598366	0.92279	4.188242	1.41288	0.053078
2013Q3	4.579706	0.917322	4.195805	1.443263	0.450249

2013Q4	4.560208	0.911783	4.203238	1.471658	0.354108
2014Q1	4.539793	0.906173	4.210546	1.498311	0.378398
2014Q2	4.520528	0.92584	4.225573	1.512217	-0.63827
2014Q3	4.50037	0.944655	4.240096	1.525693	0.161368
2014Q4	4.479229	0.962689	4.25415	1.538762	-0.18709
2015Q1	4.457007	0.980003	4.267763	1.55145	0.374748
2015Q2	4.450254	1.071882	4.285559	1.480725	0.260071
2015Q3	4.443395	1.147676	4.302654	1.396199	0.281033
2015Q4	4.436425	1.212188	4.319101	1.291147	-0.4437
2016Q1	4.429342	1.268344	4.334949	1.152288	0.424882
2016Q2	4.473002	1.249321	4.338642	1.197281	0.354108
2016Q3	4.512672	1.229426	4.342305	1.238046	0.509203
2016Q4	4.549019	1.208576	4.345937	1.275311	-0.92082
2017Q1	4.582557	1.186674	4.349538	1.30963	0.167317
2017Q2	4.56277	1.179049	4.36253	1.323768	#NUM!
2017Q3	4.542038	1.171288	4.375144	1.337459	0.220108
2017Q4	4.520267	1.163385	4.387401	1.350732	0.201397
2018Q1	4.497346	1.155336	4.399323	1.363612	0.276462
2018Q2	4.4812	1.164353	4.407003	1.365113	-0.38722
2018Q3	4.464431	1.173186	4.414551	1.36661	0.429752
2018Q4	4.446989	1.181844	4.421969	1.368101	0.432969
2019Q1	4.428816	1.190332	4.429262	1.369587	0.49276
2019Q2	4.479996	1.20412	4.43648	1.386321	0.428135
2019Q3	4.525775	1.217484	4.443579	1.402433	0.522444
2019Q4	4.567186	1.230449	4.450564	1.41797	0.489958
2020Q1	4.604989	1.243038	4.457438	1.432969	0.4843
2020Q2	4.611534	1.239612	4.511318	1.457125	0.482874
2020Q3	4.617981	1.236159	4.559245	1.480007	0.495544
2020Q4	4.624334	1.232679	4.602405	1.501744	0.488551
2021Q1	4.630595	1.22917	4.64166	1.522444	0.4843
2021Q2	4.653133	1.241173	4.661934	1.536558	0.136721
2021Q3	4.674558	1.252853	4.681304	1.550228	-0.02687
2021Q4	4.694976	1.264227	4.699846	1.563481	0.409933
2022Q1	3.659687	1.276002	4.71763	1.576341	0.30963
2022Q2	4.626521	1.244277	3.708768	1.599883	0.235528
2022Q3	4.625894	1.251638	4.698145	1.622214	0.201397
2022Q4	4.714477	1.275311	4.70482	1.58995	0.274158