

Selected Macroeconomic Variables and the Performance of Deposit Money Banks in Nigeria: 1985-2023

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Abstract

Deposit money banks play a vital role in the growth and development process of an economy and they also act as financial intermediaries as well as a key source of financing for businesses how well the Deposit money banks perform can be affected by both internal and external factors. The internal factors majorly entail the competition among banks while the external factors include the financial and macroeconomic conditions surrounding a country. Therefore, this paper is to examine the impact of selected macroeconomic variables on the performance of deposit money banks in Nigeria to achieve this paper adopted the Fully Modified Ordinary Least Squares (FMOLS) method to estimate the effect of selected macroeconomic variables on deposit money banks in Nigeria. The findings of the FMOLS revealed that inflation rate, unemployment rate, and economic growth rate have positive impact on deposit money banks performance in Nigeria. On the other hand, the interest rate has a negative and positive impact on deposit money banks performance in Nigeria and this implies that high interest rate hinders the improvement of deposit money banks performance in Nigeria. Therefore, the paper recommended that the Central Bank of Nigeria through legislation should reduce the rate of inflation, unemployment rate and interest rate to maintain its positive impact on deposit money banks performance in Nigeria and in such a way to reduce the cost of goods and services which will help to improve the deposit money banks performance in Nigeria. Also, Federal Ministry of Finance should increase the economic activities through effective management of the productivity sector with respect to industrial incentive by increasing incentive for real sector investors to improve the deposit money banks performance in Nigeria.

Keywords: *Macroeconomic, Performance, Deposit, Money Banks, Variables*

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Background to the Study

The global impact of macroeconomic variables on deposit money banks is complex and multifaceted and thus, deposit money banks must adapt to the changing economic conditions and manage risks effectively to maintain financial stability and support economic growth. Central banks use interest rates as a tool to control the money supply and inflation. When central banks raise interest rates, it becomes more expensive for deposit money banks to borrow from the central bank or interbank markets (Ekinici & Poyraz, 2019). As a result, deposit money banks may increase their lending rates, making loans more expensive for businesses and consumers. On the other hand, lower interest rates encourage borrowing and investment, stimulating economic activity and boosting the demand for loans.

Also, unemployment is an important macroeconomic problem due to its social and economic consequences and therefore essential for policy makers to identify the factors that are affecting it the most and Okoye (2018) stated that high interest rate reduce the investment of the private sector investors which lead to reduction in the job creation and employment opportunities and Mafimisebi *et al.*, (2019) opined that on the other hand unemployment of citizens reduce savings and effective demand and thereby increasing the rate of interest due to low savings and also ineffective demand reduce the profit of the invested which also reduce their ability to save profit or borrow more for future investment.

On the other hand, Amahalu & Obi (2020) opined that high inflation erodes the purchasing power of money over time, leading to a decrease in the real value of deposits. Therefore, deposit money banks need to manage their assets and liabilities carefully to ensure that their earnings can keep up with inflation. In high-inflation environments, deposit money banks may have to offer higher interest rates on deposits to attract customers, while also being cautious about the risks associated with lending. While economic growth affects the overall demand for loans and the creditworthiness of borrowers. During periods of robust economic growth, there is usually an increased demand for loans from businesses looking to expand their operations and consumers looking to finance purchases. This higher demand for credit can lead to increased profits for deposit money banks. Conversely, during economic downturns, loan demand may decline, leading to reduced profits and potential loan defaults.

However, poor banking performance will also result in bank failures and financial crises like those witnessed during the global financial crisis that began in 2007 (Ekpung *et al.*, 2015). This explains why banks are one of the most regulated sectors in the world today. Dare and Okeya (2017) noted that the role banks play in an economy is so significant that the collapse of a large bank would be worse than that of any other institution in an economy. However, we must point out that the performance of banks is contingent on several factors. In specific terms, how well the banking system performs can be affected by both internal and external factors. The internal factors majorly entail the competition among banks while the external factors include the financial and macroeconomic

conditions surrounding a country. Overall, how well banks can compete is mainly driven by their capacity to innovate. Thus, it is expected that the competitiveness of each bank to vary according to the features and advantages they possess. On the contrary, the financial and macroeconomic conditions facing all banks are the same.

Commercial banks play a vital role in the growth and development process of an economy. They also act as financial intermediaries as well as a key source of financing for businesses. Banks also ensure the efficient allocation of resources in that they mobilize funds for various productive activities. In practice, they transfer funds from those with surplus funds to those that need it for productive activities which in turn stimulate investments and improve economic growth and development. On the contrary, when banks fail in their financial intermediation function, we expect declining economic growth and development. In Nigeria, several macroeconomic policies and reforms have been carried out which are directly targeted at revitalizing the banking sub-sector. Nigeria like any other developing Countries adopted the Structural Adjustment Programs (SAP) in 1986 which led to major transformations in the banking sub-sector. Countries eased controls on interest rates and reduced government involvement in the financial sector thereby opening doors to international banks.

Another reform measure worthy of mention is the National Economic Empowerment and Development Strategy (NEEDS in 2003, the programme which sought to re-capitalize the financial system as well as address incidences of systemic distress in the financial sector. This programme led to an increase in the minimum capital requirement for banks from 2 billion to 25 billion naira in 2004. Also, the banking consolidation policy resulted in the reduction of banks operating in the country from 89 in 2004 to 25 in 2006, a process that resulted from mergers and acquisitions. Despite these reforms, the sector continues to face numerous challenges. Not only is the banking sector dominated by few banks, five banks dominate the shareholders' funds accounting for about 48.52% of the capitalization of the entire banking industry.

According to the CBN (2022), 46.34% of the total branch network in the country is accounted for by the top five banks. The KPMG (2013) report also states that only about 20% of Nigeria's population is banked. Data from the World Bank indicate that the total return on assets for commercial banks in Nigeria decreased from 3.8 percent in 2010 to 1.32 percent in 2021, while the total return on equity peaked in 2001 at 34.09 percent and decreased to 11.82 percent in 2021. The net interest margin declined, from 12.12 percent in 2002 to 3.6 percent in 2021 (World Bank, 2022). In the literature, scholars have argued the need to curtail the adverse impact of macroeconomic shocks on bank performance using appropriate policy measures. While some argue the need to ensure proper corporate governance, others believe that attention should be paid to issues surrounding proper regulation by the appropriate authorities.

This study is motivated by the apparent dearth of empirical studies on the impact of macroeconomic variables on bank performance in Nigeria. The literature is replete with

empirical studies focused on monetary policy and Studies on Nigeria are scant, the few available ones majorly focused on bank-specific determinants, leaving out the influence of macroeconomic factors on deposit money bank performance in Nigeria Ekpung *et al.*, (2018) and Afolabi & Akinde (2023). This paper, therefore, takes a different approach by exploring the impact of macroeconomic variables on bank performance given the macroeconomic factors that have been hindering bank performance in recent times in Nigeria by examining the impact of selected macroeconomic variables on the performance of deposit money banks in Nigeria. The study seeks to provide answers to the following questions which were raised from the background of the study and stated as follows; to what extent has inflation affected the performance of deposit money banks in Nigeria?, what is the effect of unemployment on the performance of deposit money banks in Nigeria?, how has economic growth affected the performance of deposit money banks in Nigeria?, and lastly, what is the effect of interest rates on the performance of deposit money banks in Nigeria?

Materials and Methods

Conceptual Review

Deposit Money Banks

Deposit money bank financing is the borrowing capacity provided to an individual, government, firm, or organization by the banking system in the form of loans. Thus, according to James and Ikwuagwu (2016), Deposit Money Banks (DMBs) serve as a veritable source in which credits are channeled to different sectors of the economy through their intermediation role. Namazbai *et al.*, (2023) opined that DMBs are a generic name for commercial and merchant banks operating in the country since the commencement of universal banking in 2001 hence DMBs credit is the borrowing ability of these universal banks to provide loans to individuals, government, or organization.

Macroeconomic Policy Variables

Macroeconomic policy is an instrument through which the government of an economy tries to regulate the economic affairs of a country in line with set objectives and macroeconomic policy climate dictates the environment in which agricultural activities are carried out (Mordi *et al.*, 2014). While, according to Salihu *et al.*, (2023), inflation is conventionally defined as a persistent rise in the general level of prices of goods and services in an economy over a while. When the general price level rises, each unit of currency buys fewer goods and services, thus eroding the purchasing power of money. Inflation is measured by the inflation rate; the annualized percentage change in the general price index (usually the Consumer Price Index) over time (Ogbuji *et al.*, 2022).

Also, the International Labour Organization (ILO), (2018) defines unemployment as a number of the economically active population who are without work but available for and seeking work, including people who have lost their jobs and those who have voluntarily left work. Unemployment is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by individuals currently in the labour force (Ozughalu & Ogwumike, 2018). While, economic

growth can be defined as a periodic increase in a nation's output, which is most commonly measured by the gross domestic product (GDP) of the nation. The benefits stemming from economic growth are wide-ranging Osundina *et al.*, (2016) sees economic growth as the process of augmenting the productive forces or expanding productive capacity which is accomplished through effective mobilization, assemblage, and management of human, material, and financial resources. According to Nwaoha & Onyeguli (2021), economic growth implies an increase in the net national product in a given time and it is defined as a steady process by which the productive capacity of the economy is increased over time to bring about rising levels of national output and income. Finally, Interest rate is described as the price of money that is the amount of interest paid per unit of time expressed as a percentage of the amount borrowed (Namazbai *et al.*, 2023). The cost of borrowing money, measured in naira, per year per naira, borrowed, is the interest rate. Interest rates differ mainly in terms/maturity that is the length of time for repayment and liquidity is the quick conversion of assets to funds (Adesina *et al.*, 2016).

Empirical Review

Ayodele *et al.*, (2023) investigated interest rate behaviour and Nigerian financial sector growth: a relationship analysis and Autoregressive Distributed Lags model was used for the estimation of this paper. the result showed that lending interest rate was the most significant influencer of the growth in the financial sector. In contrast, the deposit interest rate was weak in influencing the growth of the financial sector in the long run. However, the relationship exhibited by these variables differs slightly in the short run. While Ariwa and Uremadu (2023) examined interest, rate spread (IRS) and performance of deposit money banks (DMBs) in Nigeria for the period 2007 to 2020. Panel data (fixed effect) regression technique was employed as the test statistic. Findings showed that IRS had a significant effect on ROE and PAT of the DMBs while it had no significant effect on ROA of DMBs in Nigeria. The study recommended, among others, that Central Bank of Nigeria (CBN) should fashion out ways of narrowing IRS in Nigeria, by either by decreasing lending rate or increasing deposit rate, thus, increase performance of DMBs in Nigeria.

In another study Asobari and Lodikero (2023), examined monetary policy and performance deposit money banks in Nigeria. From the multiple regression (OLS) test, it was found that CRR have a positive and insignificant relationship with the ratio of banks' ROA/GDP. EXR was observed to have a negative and significant relationship with the ratio of banks' ROA/GDP. However, this use of OLS regression created a gap for other studies because OLS regression only examines the long run impact or effect and does not considers the short run adjustment of the model used. Also, Segun *et al.*, (2023) examined the effect of monetary policy on deposit liabilities of commercial banks in Nigeria. The Autoregressive Distributed Lag Model (ARDL) regression technique was employed. The findings of the study indicated that interest rate and cash reserve ratio influenced the performance of banks in terms of their deposit liabilities. The study recommends that governments should ensure good and stable monetary policy in Nigeria such that deposit money banks' performance can be enhanced in Nigeria.

In another study, Udenwa *et al.*, (2023) examined the effect of credit risk on the financial performance of quoted deposit money banks in Nigeria. The results of the panel regression revealed that non-performing loans to total loans and loan loss provision to total loans have a significant effect on the financial performance of the quoted deposit money banks in Nigeria. The study recommends that quoted deposit money banks should improve their methods for assessing credit risk by establishing strict guidelines for loan underwriting, carrying out in-depth borrower assessments, and assessing the strength of collateral. Also, Merko and Habili (2023) measured the impact of interest rates, exchange rates, and inflation on the performance of commercial banks in Albania. The multiple regression model and the estimation results reveal that the interest rate variability has a high impact on the financial factor ROA. In contrast, the variability of the exchange rate harms it. The effect of variable nominal effective exchange rate (NEER) on ROA is low, and inflation negatively influences it and the model has resulted within all the criteria related to the regression analysis but with a low importance level.

Bassey *et al.*, (2022) examined the market risks and profitability of deposit money banks in Nigeria and panel multiple regression analysis. The interest rate had positive effects on bank profitability, while exchange rate and commodity prices reduced performance. The study recommended that banks manage their operations in a way that optimizes their earnings and profits in order to mitigate the risks of loss occasioned by exchange rate dynamics in Nigeria. Also, DMBs should revitalize their interest rate risk management strategies to further boost their earnings through interest income and however, the study has no clear method of analysis and the panel multiple regressions claimed to be used for analysis cannot go for time serial data. While, Abdulrasheed (2022) examined the performance of deposit money banks and their impact on the growth of the Nigerian economy. Autoregressive Distributed Lag Model was used and the finding revealed that all the explanatory variables had a significantly positive impact on GDP per capita in the long run, while all other variables, except Asset, had a positive impact on GDP per capita in the short run. The study, therefore, recommends that monitoring institutions such as the NDIC and CBN should further enhance the supervision of the management of banking operations in Nigeria.

Ishioro (2022) explored the role and importance of DMBs inappropriately including the financially excluded economic agents in the trajectory of FICn, and critically evaluated the potency of DMB-based FICn proxies and surrogates on growth. The study employed diverse estimation techniques in the validation of the models. Results that emerged from the analysis indicated that: GDPP (GDP per capita) is a determinant of ATMp penetration, ownership, and usage in Nigeria in the short-run only; ATMp penetration, ownership, and usage only Granger-caused GDPP in the long-term; ATMp Granger-caused the spread of banks branches network in the long-run, while the spread of banks branches network Granger-caused ATMp in the short-run (a confirmation of non-sustainable and ephemeral impact). Also, Oluwayemisi *et al.*, (2022) examined a relationship between interest rates and the financial performance of listed deposit money banks in Nigeria. The statistical analysis revealed that there are positive and statistically significant

relationships between domestic money supply and financial performance; maximum lending rate has a positive relationship with financial performance; the relationship between the two is statistically significant; monetary policy rate has a positive and statistically significant effect on financial performance; and inflation has a negative and statistically significant effect on financial performance. The study concluded that, interest rate liberalization in Nigeria benefited the financial performance of the country's deposit money banks.

Awa and Uwaguri (2021) examined the relationship between interest rate deregulation and performance of Nigerian deposit money banks for the period 1996-2018. ARDL results using serial correlation, heteroscedasticity and normality tests. The results of the tests revealed that all the variables were integrated of order zero or one, and that a long-run relationship exists between the variables. Consequently, ARDL model for parameter estimation process revealed that only prime lending rate was positively related to ROA of banks while none of the explanatory variables was statistically significant and this study gap is that the data used stopped at 2018 and the study variables did not adequately capture the objectives of the study. Also, Ndubuaku *et al.*, (2021) examined financial development on employment rate in Nigeria on the premise of goal 8 of the sustainable development goals (SDGs). Using the ARDL model and annualized time-series data from 1999-2019. Findings revealed a positive and statistically significant impact of financial development on employment rate. The study recommences a policy framework to influence the operational and business activities of financial institutions to stir employment generation and economic growth in Nigeria. The study used the ARDL model however, the short run results were not presented and discussed and also, the short run speed of adjustment of the study was not presented.

Isiaka (2019) empirical investigated how financial development relates to unemployment in the short-run and the long-run, taking into consideration different measures of financial development. This paper employed ARDL as a method of estimation, it was found that only financial system deposit to GDP has a potential to reduce the unemployment rate in the short run and the long run. Other financial indicators such as credit to the private sector, financial liquidity, financial efficiency and financial stability only reduce the unemployment rate in the short run. While, Zermeno *et al.*, (2018) applied panel quantile regressions and the results indicate a consistently negative and nonlinear effect of price increases on financial variables; in particular, it is statistically significant in the full sample of countries, significant in developing countries, and insignificant in developed countries. Also, Muraina (2018) examined the variables that influenced the profitability of DMBs in Nigeria from 2008-2016. Data for the analysis was sourced from fourteen DMBs that were quoted in the NSE. The study adopted ROA as the proxy for profitability, while the regressor variables were; capital adequacy, credit risk, and inflation. The findings from the study show that while CAD had a positive, but significant effect on profitability, credit risk had a negative significant impact on profitability however, the study has no clear method of analysis and this created a gap in this study.

Theoretical Framework

This study proposed that the supply-leading hypothesis theory and demand-following hypothesis as the theoretical framework and the supply-leading hypothesis theory first line of argument led by Schumpeter (1934) asserted that finance has a positive impact on growth by financing innovative ideas. McKinnon (1973) and Shaw (1973) developed a framework within which the financial sector increases growth by raising savings and investment.

To achieve this, they called for liberalization of interest rates and, as the real interest rate increases, the incentive to save also increases. Gurley and Shaw (1955) highlighted the role of financial institutions in directing surplus units to deficit units to promote growth. The second argument is the demand-following hypothesis which states that it is economic growth rather than financial development that leads to the emergence and development of the financial sector. This view was introduced by Robinson (1952), who argued that expansion in economic activities within an economy necessitates the presence of financial institutions to provide services essential for economic growth. Hence, growth leads, and finance follows. The third standpoint sought to combine the two arguments above and suggested the existence of a mutual relationship between the finance sector's stability and growth. Ali *et al.*, (2010) put forward the stages of a development hypothesis where finance initially spurs economic growth, as suggested by the finance-leading or supply hypothesis. As growth is enhanced through expansion in financial activities, growth supports finance, following the demand-leading hypothesis. This theory established a functional relationship between macroeconomic activities and deposit money bank activities in a developing country like Nigeria.

Methodology

Sources and Nature of Data

This paper employed the *ex-post facto* research design and adopted the secondary method of data collection. The data used in this paper were sourced from the Central Bank of Nigeria (CBN) and National Bureau of Statistics (NBS). The Deposit Money Banks Performance in Nigeria (DEM), Inflation Rate in Nigeria (IFN), Economic Growth in Nigeria (ECG) and Interest Rate in Nigeria (IRS) were sourced from the Central Bank of Nigeria (CBN) while, Unemployment Rate in Nigeria (UEM) were sourced from the National Bureau of Statistics (NBS).

Model Specification

This paper adopted and modified the model of Afolabi and Akinde (2023) who examined the impact of monetary policy and the performance of deposit money banks in Nigeria and the functional relationship of variables in the model is represented as follows:

$$TLTA = f(MPR, LR) \tag{1}$$

Where TLTA is the Ratio of Total Loans to Total Assets, MPR is the monetary policy rate in Nigeria, and LR is the Liquidity Ratio in Nigeria. Thus, the initial functional equation of

the adopted model of Afolabi and Akinde (2023) was modified into a functional equation for this study based on the specific objectives as follows:

$$DMB_t = f(IFR_t, UEM_t, ECG_t, ITR_t) \tag{2}$$

Equation 2 shows the functional relationship and model that will be used to establish the effect of selected macroeconomic variables on deposit money banks in Nigeria. Where $DMBN_t$, the Deposit Money Banks' Performance in Nigeria is, $IFRN_t$, is the Inflation Rate in Nigeria, $UEMN_t$, is the Unemployment Rate in Nigeria, $ECGN_t$, is the Economic Growth in Nigeria and $ITRN_t$, is the Interest Rate in Nigeria?

The explicit function is captured as:

$$DMB_t = \beta_0 + \beta_1 IFR_t + \beta_2 UEM_t + \beta_3 ECG_t + \beta_4 ITR_t + \mu_t \tag{3}$$

Suffice it to reiterate that co-integration provides the theoretical underpinning for the error correction model. Where; β_0 is the intercept or autonomous parameter estimate, $\beta_1 - \beta_4$ are the slope of the coefficients of the independent variables to be determined, DMB_t is the Deposit Money Banks Performance in Nigeria at time t, IFR_t is the Inflation Rate in Nigeria at time, UEM_t is the Unemployment Rate in Nigeria at time t, ECG_t is the Economic Growth in Nigeria at time t, ITR_t is the Interest Rate in Nigeria at time t and μ_t is Error term or residual.

Variable Description, Measurements and A-priori Expectation

Table 1: Description of the Variables Used for the Model

Variable	Measurement	Type	Source	Apriori Expectation
DMB	The total deposit of the deposit money banks in Nigeria and this variable is measured in Billion Naira.	Dependent	CBN, 2023	
IFR	The inflation rate in Nigeria was measured in percentage.	Independent	CBN, 2023	$\beta_1 >> 0$
UEM	The unemployment rate was measured in percentages.	Independent	NBS, 2023	$\beta_2 >> 0$
ECG	Economic growth in Nigeria and this variable was measured in percentages.	Independent	CBN, 2023	$\beta_3 >> 0$
ITR	Interest rate in Nigeria was measured in percentages	Independent	CBN, 2023	$\beta_4 >> 0$

Source: Author's Compilation, 2024

Method of Analysis

The paper used the Fully Modified Ordinary Least Squares (FMOLS) was used to estimate the effect of selected macroeconomic variables on deposit money banks in Nigeria. Thus, the Fully modified Ordinary Least Squares (FMOLS) was used to analyse the impact of selected macroeconomic variables on deposit money banks performance in Nigeria. This regression technique further shows a precise quantitative measurement of the degree of relationships between dependent and independent variables. As a rule of thumb, the usefulness of regression is further to assess the level, nature, and significance of the relationships among the variables, as well as to test the existence of robustness among the variables.

Presentation and Discussion of Results

Descriptive Statistics

Table 2 shows the descriptive summary of all the variables used in this paper which are the Deposit Money Banks Performance in Nigeria (DEM), Inflation Rate in Nigeria (IFN), Unemployment Rate in Nigeria (UEM), Economic Growth in Nigeria (ECG) and Interest Rate in Nigeria (IRS).

Table 2: Descriptive Summary

	DEM	IFN	UEM	ECG	IRS
Mean	19019.16	17.99147	4.914412	4.255294	18.00618
Maximum	90893.14	72.80000	9.788000	15.33000	29.80000
Minimum	82.96000	5.400000	3.700000	-2.040000	11.50000
Skewness	1.473163	2.234842	1.592341	0.495518	0.767140
Kurtosis	4.522335	7.032474	3.825316	3.492118	4.522845
Jarque-Bera	15.58098	51.33847	15.33307	1.734469	6.620185
Probability	0.000414	0.000000	0.000468	0.420112	0.036513
Observations	34	34	34	34	34

Source: Researcher's Computation Using EViews-12 (2024)

Table 2 shows the statistical summary of the variables and revealed that mean value of the deposit money banks performance in Nigeria is 19019.16 billion Naira, the maximum value is 90893.14 billion Naira and the minimum value is 82.96. The mean value for the inflation rate in Nigeria is 17.99 percent, the maximum value is 72.8 percent, and the minimum value is 5.4 percent. The mean value of unemployment rate in Nigeria is 4.91 percent, the maximum value is 9.79 percent and the minimum value is 3.7 percent. Also, the mean value of economic growth in Nigeria is 4.26 percent, the maximum value is 15.3 percent and the minimum value is -2.04 percent and the mean value of interest rate in Nigeria is 18.0 percent, the maximum value is 29.8 percent and the minimum value is 11.5 percent.

Jarque-Bera statistic tests the hypothesis that the series is normally distributed and the high values for deposit money banks performance in Nigeria, inflation rate in Nigeria, unemployment rate in Nigeria and interest rate in Nigeria and their associated low

probabilities confirm that these series deviate from a normal distribution. This is consistent with the observed skewness and kurtosis, which suggest that these variables have distributions with more pronounced tails and peaks than a normal distribution. While, low value of economic growth in Nigeria and its associated probability suggest otherwise, this means series was normally distributed.

Stationary Tests (Unit Root Tests)

This section shows the unit root of the variables using the Augmented Dickey-Fuller (ADF) Test to check the stationary at a 5 percent level of significance.

Table 3: Unit Root Test Result

Variable	Augmented Dickey-Fuller (ADF) Test		Status
	ADF	@ 5%	
DEM	-4.621090	-3.568379	1(1)
IFN	-4.715758	-3.557759	1(1)
UEM	-7.241886	-3.557759	1(1)
ECG	-9.214078	-3.557759	1(1)
IRS	-10.15377	-3.557759	1(1)

Source: Author's Computation Using EViews-12 (2024)

Table 3 shows the stationary test of the variables used in this paper. Thus, the results revealed that all the variables were integrated at order one 1(1). This implies that they were not stationary at the level until they were differenced and they were said to be integrated of order one 1(1). Given the result, as shown by ADF tests and the order of integration of the variables there is no long-run relationship among the economic variables. Therefore, the paper went further to test for the long-run relationship by testing the co-integration using the Engle and Granger (Residual Based) Co-integration Test.

Co-integration Test Results

The Engle-Granger residual-based co-integration test is a two-step procedure to determine whether a long-term equilibrium relationship exists between two or more non-stationary variables. The premise of co-integration is that if two or more series are individually non-stationary. Still, a linear combination of them is stationary, then the series is said to be co-integrated. This implies that despite short-term deviations, the variables tend to move together over time, suggesting a stable long-term relationship.

Table 4: Results of Engle and Granger (Residual Based) Co-integration Test

Variable	ADF Test Statistic	95% Critical ADF Value	Remarks
Residual	-3.361948	-2.954021**	Co-integrated

*Note: **significant at 5%*

Source: Author's Computation Using EViews-12 (2024)

Table 4 shows the Engle and Granger (Residual Based) co-integration test and the variable under consideration the residual from a long-run equilibrium equation estimated with the variables of interest exhibits an Augmented Dickey-Fuller (ADF) test statistic of -3.361948. This value is more negative than the provided 95% critical ADF value of -2.954021, which is significant at the 5% level. This indicates that the null hypothesis of no co-integration can be rejected, and thus, the paper concluded that the variables in the estimated equation are co-integrated. This result has profound implications for our understanding of the relationship between selected macroeconomic variables and deposit money banks performance in Nigeria. It suggests that there exists a long-term equilibrium relationship between selected macroeconomic variables and deposit money banks performance in Nigeria.

Fully Modified Ordinary Least Squares (FMOLS) Regression Results

This section presented the long-run FMOLS regression analysis where the deposit money banks performance in Nigeria, inflation rate in Nigeria, unemployment rate in Nigeria, economic growth in Nigeria and interest rate in Nigeria.

Table 5: Fully Modified Ordinary Least Squares (FMOLS) Model Results

Dependent Variable: DEM				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
IFN	232.5233	212.0444	1.096578	0.2822
UEM	8803.828	1641.811	5.362267	0.0000
ECCG	1682.995	937.1931	1.795783	0.0833
IRS	-4296.701	889.1025	-4.832628	0.0000
C	42008.52	19628.98	2.140127	0.0412
R-squared	0.654041			
Adjusted R-squared	0.604618			
F-statistics	17.11244			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.209642			

Source: Author's Computation, using E-views 12, (2024)

The FMOLS results, as reflected in Table 5, revealed the coefficients and their corresponding t-statistics and probability values for each selected macroeconomic variable. The variable inflation rate in Nigeria shows a positive coefficient of 232.52, with a t-statistic of 1.096578, which indicates an insignificant positive impact on deposit money banks performance in Nigeria at the 5% level (Prob. 0.2822). This suggests that an increase in inflation rate in Nigeria tends to have fair impact on the deposit money banks performance in Nigeria, possibly because increased inflation rate will lead to increased cost of goods and services which will in turn lead to reduction in savings and bank deposits. This dynamic relationship may be the cause of insignificant impact of inflation rate on deposit money banks performance in Nigeria. On the other hand, the unemployment rate presents an even more pronounced impact with a coefficient of 8803.8 and an impressive t-statistic of 5.362267, which is highly significant (Prob. 0.00000) and

positive impact on deposit money banks performance in Nigeria. This implies that a large number of the population and the productive labour force are available for banking activities at a minimum wage and this high unemployed population can engage in self-employed activities that will generate savings for the bank.

Similarly, Nigeria's economic growth rate has a positive coefficient of 1682.9 with a t-statistic of 1.79783, which is insignificant at the 5% level (Prob. 0.0833). This positive but insignificant impact implies that an increase in economic growth rate is associated with little or no impact on deposit money banks performance in Nigeria. Finally, Nigeria's interest rate has a negative coefficient of -4296.7 with a t-statistic of -4.832628, which is significant at the 5% level (Prob. 0.000). This negative relationship implies that an increase in interest is associated with a decrease in deposit money banks performance in Nigeria. It could be inferred that high levels of interest rates could deter investment and the industrial sector, thereby reducing the level of savings and deposits.

The R-squared value of 0.654041 indicates that the model explains a very high proportion of the variation in deposit money banks performance in Nigeria. The adjusted R-squared value of 0.604618, suggesting that the model fits the data well, while accounting for 60% of the number of explanatory variables included. The F-statistic of 17.11244, with a probability of 0.0000, is highly significant. This indicates that the overall regression equation is statistically significant and that there is a collective impact of the selected macroeconomic variables on deposit money banks performance in Nigeria. The very low probability associated with the F-statistic, being well below a common alpha level of 0.0000, essentially rejects the null hypothesis that the model with no independent variables would be as explanatory of the variation in deposit money banks performance in Nigeria as the current model. The Durbin-Watson statistic is 1.21, which is close to the value of 2. This statistic looks for autocorrelation in the residuals of a regression analysis and in our scenario, the Durbin-Watson statistic provides further assurance against autocorrelation, validating the dependability of the regression results.

Furthermore, the hypothesis that stated H_{01} : inflation rate has no significant impact on deposit money banks performance in Nigeria is accepted given that the probability value of 0.2833 is greater than 5 percent level of significance. This implies that the inflation rate has a positive but insignificant impact on the deposit money banks performance in Nigeria. On the contrary, the hypothesis that stated H_{02} : unemployment rate has no significant impact on deposit money banks performance in Nigeria is rejected given that the probability value of 0.0000 is less than 5 percent level of significance. This implies that the unemployment rate has a positive and significant impact on the deposit money banks performance in Nigeria.

Similarly, hypothesis that stated H_{03} : the economic growth rate has no significant impact on deposit money banks performance in Nigeria is accepted at a 5 percent level of significance given that the probability value of 0.0833 is greater than 5 percent level of significance. This implies that the economic growth rate has a positive and insignificant

impact on the deposit money banks performance in Nigeria. Finally, the hypothesis that stated H_{05} : interest rate has no significant impact on deposit money banks performance in Nigeria is rejected at a 5 percent level of significance given that the p-value of 0.000 is less than the 5 percent level of significance. This implies that the interest rate has a negative and significant impact on the deposit money banks performance in Nigeria.

Post-Estimation Checks (FMOLS Diagnostic Test)

The results from the Fully Modified Ordinary Least Squares (FMOLS) diagnostic checks captured in Table 6 are crucial for validating the robustness and reliability of the regression model that investigates the impact of selected macroeconomic variables on deposit money banks performance in Nigeria and these post-estimation tests assess various assumptions underlying the FMOLS regression analysis, ensuring that the model's inferences are statistically sound.

Table 6: Results of FMOLS Diagnostic Checks

Tests		Outcomes	
		Coefficien t	Probability
Breusch-Godfrey-Serial-Correlation Test	F-stat.	2.006036	0.1541
Heteroscedasticity-Breusch-Pagan-Godfrey Test	F-stat.	1.464180	0.2386
Normality Test	Jarque-Bera	6.604464	0.0368
Linearity Test	F-stat	1.405280	0.0368

Source: Researcher's Computation Using EViews-12 (2024)

Table 6 is the Breusch-Godfrey Serial Correlation LM Test checks for autocorrelation in the regression model with an F-statistic of 2.006036 and a probability of 0.1541, suggests that there is no significant serial correlation in the model. A high p-value indicates that the paper fails to reject the null hypothesis of no serial correlation, thus confirming that the residuals of the model are independent across time, which is a desirable property in time series analysis. Also, the Heteroscedasticity Breusch-Pagan-Godfrey test yields an F-statistic of 1.464180 with a probability of 0.2386, indicating that there is no significant evidence of heteroscedasticity within the model. This means that the variance of the error terms is constant, allowing for confidence in the estimated standard errors and the statistical tests that rely on them.

The Normality Test, specifically the Jarque-Bera test statistic is 6.604464 with a probability of 0.0368, which indicates that the residuals are normally distributed. With a high p-value, the null hypothesis that the residuals are normal cannot be rejected, satisfying another critical assumption of the classical linear regression model. Finally, the F-statistic of the linearity test of 1.405280 with a probability of 0.0368 This result implies that there is no significant evidence against the linearity assumption of the model. Hence, the linear specification of the relationship between the selected macroeconomic variables and deposit money banks performance in Nigeria appears to be appropriate.

Discussion of Findings

The paper focused on the impact of selected macroeconomic variables on deposit money banks performance in Nigeria. The fully modified ordinary least squares result revealed that inflation rate was found to have a positive and significant impact on deposit money banks performance in Nigeria and this implies that increase in inflation rate will lead to substantial increase in deposit money banks performance in Nigeria and this finding agreed with the work of Merko and Habili (2023) who concluded that there is a positive impact of inflation rate on deposit money banks performance in Nigeria. However, unemployment rate showed a positive and significant impact on deposit money banks performance in Nigeria, which suggested that an increase in the unemployment rate is associated with a decrease in deposit money banks performance and this is because unemployment provides the need labour at a minimum wage to improve deposit money banks performance in Nigeria. This finding disagreed with the work of Jabaru and Jimoh (2020), that unemployment rate has an insignificant impact on per capita income.

Also, the paper revealed that the economic growth rate has a positive and insignificant impact on deposit money banks performance and this finding agreed with the work of Ndubuaku *et al.*, (2021) who concluded that economic growth rate has a positive but insignificant impact on deposit money banks performance. Finally, interest rate showed a negative and insignificant impact on deposit money banks performance in Nigeria, which suggests that an increase in the interest rate is associated with a decrease in deposit money banks performance in Nigeria and this is because high-interest rate reduces investment in the productive sectors of the economy and this will reduce the gross domestic product and in turn reduce the deposit money banks performance in the economy and this agreed with the work of Ayodele *et al.*, (2023) who concluded that interest rate negatively impacts on deposit money banks performance in Nigeria.

Conclusion and Recommendations

In conclusion, the investigation revealed through the analysis of the fully modified ordinary least squares results on the impact of selected macroeconomic variables on deposit money banks performance in Nigeria that inflation rate, unemployment rate, and economic growth rate have positive on deposit money banks performance in Nigeria but unemployment rate seems to have positive and significant impact on deposit money banks performance in Nigeria and this made unemployment rate if well managed is an important variable among the macroeconomic variables in improving the level of deposit money banks performance in Nigeria. On the other hand, interest rate has a negative and positive impact on deposit money banks performance in Nigeria and this implies that high interest rate hinders the improvement of deposit money banks performance in Nigeria. Therefore, the following recommendations were raised from the research findings.

- i. The Central Bank of Nigeria through legislation should reduce the rate of inflation to maintain its positive impact on deposit money banks performance in Nigeria and in such a way to reduce the cost of goods and services which will help to improve the deposit money banks performance in Nigeria.

- ii. The Nigerian government should through the Federal Ministry of Labour and Productivity create policies and initiatives targeted at managing the rate of unemployment through increase industrial activities and incentive for investors in the real sectors of the economy which will lead to a positive impact on deposit money banks performance in Nigeria through savings.
- iii. The Central Bank of Nigeria and Federal Ministry of Finance should increase the economic activities through effective management of the productivity sector with respect to industrial incentive by increasing incentive for real sector investors to improve the deposit money banks performance in Nigeria.
- iv. Similarly, Central Bank of Nigeria should manage the rate of interest through the commercial banks and other banking institutions, especially the interest rate of real sectors of the economic thereby increasing the national output for improved deposit money banks performance in Nigeria.

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APPENDIX I

Year	DEM ₦ Billion	IFN (%)	UEM (%)	ECC (%)	IRS (%)
1990	82.96	7.5	4.104	11.78	25.50
1991	117.51	13	4.122	0.36	20.01
1992	159.19	44.5	4.089	4.63	29.80
1993	226.16	57.2	4.102	(2.04)	18.32
1994	295.03	57	4.085	(1.81)	21.00
1995	385.14	72.8	4.061	(0.07)	20.18
1996	458.78	29.3	4.027	4.20	19.74
1997	584.38	8.5	4.015	2.94	13.54
1998	694.62	10.00	3.999	2.58	18.29
1999	1070.02	6.6	3.99	0.58	21.32
2000	1568.84	6.9	3.954	5.02	17.98
2001	2247.04	18.9	3.935	5.92	18.29
2002	2766.88	12.9	3.882	15.33	24.85
2003	3047.86	14.00	3.899	7.35	20.71
2004	3753.28	15.00	3.876	9.25	19.18
2005	4515.12	17.9	3.871	6.44	17.95
2006	7172.93	8.4	3.856	6.06	17.26
2007	10847.12	5.4	3.837	6.59	16.94
2008	15836.64	11.5	3.819	6.76	15.14
2009	17292.32	12.6	3.796	8.04	18.99
2010	17302.82	13.8	3.778	8.01	17.59
2011	19362.94	10.9	3.77	5.31	16.02
2012	21235.29	12.2	3.742	4.23	16.79
2013	24415.73	8.50	3.7	6.67	16.72
2014	27508.45	8.00	4.56	6.31	16.55
2015	28287.83	9.00	4.31	2.65	16.85
2016	31953.50	18.27	7.06	(1.62)	16.87
2017	35035.11	10.71	8.39	0.81	17.56
2018	38407.79	13.00	8.456	1.92	19.33
2019	43578.60	11.40	8.53	2.21	15.53
2020	54579.73	13.25	9.714	(1.79)	12.32
2021	62930.76	16.95	9.788	3.11	11.50
2022	78037.98	17.21	4.104	3.40	11.74
2023	90893.14	18.62	7.869	3.55	11.85

Source: Central Bank of Nigeria Annual Reports from 1990-2023 and National Bureau of Statistics (NBS) 2023