

ASSESSING THE IMPACT OF MACROECONOMIC VARIABLES ON THE FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN NIGERIA

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Abstract

This study examines the impact of macroeconomic variables on the financial performance of commercial banks in Nigeria using an annual panel dataset from 2000 to 2022. A sample of seven banks is considered, and four macroeconomic variables are examined: interest rate, exchange rate, inflation rate, and the ratio of money supply to GDP. The panel ARDL model is applied to assess the long-run and short-run relationships between these variables and the banks' financial performance, measured by Return on Assets (ROA). The findings indicate that interest rates have a positive and significant effect on bank performance, while the exchange rate has a negative and significant impact. Inflation rate is not found to be a significant determinant, and a significant negative relationship is observed between the money supply-to-GDP ratio and bank performance. These findings have implications for policymakers, regulators, and commercial banks, emphasizing the need to consider interest rates, exchange rates, and money supply-to-GDP ratio in formulating monetary policies and managing risks to ensure long-term financial stability and performance.

Keywords: macroeconomic variables, exchange rate, interest rate, return on assets.

INTRODUCTION

The performance of the financial sector is influenced by a country's macroeconomic factors, as highlighted by Combe and Togbenou (2017). Banks operate in a dynamic and uncertain environment due to the interplay of various forces, including macroeconomic variables, as noted by Mueni (2015). The financial sector plays a pivotal role in driving economies, with commercial banks acting as facilitators of financial intermediation, efficient payment systems, and enablers of effective monetary policy implementation (Mueni, 2015). Governments worldwide have established banking systems that prioritize the security of deposits, promote efficient intermediation, foster healthy competition, and instill public confidence in the financial sector. Consequently, the banking industry serves as a key regulator of global economies (Combe & Togbenou, 2017).

Monetary policy, as defined by the Central Bank of Nigeria (CBN, 2014), is responsible for regulating the price, value, and supply of money to align with a nation's economic activity. According to Epstein & Grabel (2006), monetary policy refers to government actions that impact money supply and interest rates through various mechanisms such as open market

operations, discount rates, reserve requirements, special deposits, and stabilization securities. These policies play a crucial role in regulating the banking sector. They encompass instruments that influence and regulate bank operations, often leading to enhanced bank profitability, as noted by [Adesina et al \(2018\)](#). Profitability is essential for commercial banks as they rely on positive returns on their invested capital. The relationship between monetary policy and commercial banks is interconnected, with profitability of the banking system assessed using portfolio control and market intervention approaches. Factors such as interest rates, deposit volume, domestic and foreign investments, liquidity ratios, prestige, and public recognition influence commercial banks' loan decisions, as stated by [Olokoyo \(2011\)](#).

Nigeria, like many other developing countries, has experienced significant economic fluctuations in recent years, including periods of high inflation, currency depreciation, and interest rate volatility ([Olokoyo, 2011](#)). These macroeconomic variables have had a profound impact on the financial performance of deposit money banks in the country. Interest rate is one of the key macroeconomic variables that affect the financial performance of deposit money banks (cite). changes in interest rate can affect the cost of funds, the level of borrowing, and the overall profitability of banks ([Laurine, 2013](#)). For instance, a high interest rate environment can increase the cost of borrowing and reduce the demand for loans, leading to lower interest income and profitability for banks. On the other hand, a low interest rate environment can increase the demand for loans and reduce the cost of borrowing, leading to higher interest income and profitability for banks ([Laurine, 2013](#)).

Furthermore, exchange rate is another macroeconomic variable that can affect the financial performance of deposit money banks. Changes in exchange rate can affect the value of the naira, the local currency, against foreign currencies, and can have a significant impact on the profitability of banks ([Ajayi & Atanda, 2012](#); [Frenkel, 2019](#)). For instance, a depreciation of the naira can increase the risk of default and reduce the profitability of banks, while an appreciation of the naira can reduce the risk of default and increase the profitability of banks ([Frenkel, 2019](#)).

Significantly, inflation rate is also a key macroeconomic variable that can affect the financial performance of deposit money banks. changes in inflation rate can affect the purchasing power of money, the level of borrowing, and the overall profitability of banks ([Ongore & Kusa 2013](#)). For instance, a high inflation rate can increase the level of borrowing and reduce the purchasing power of money, leading to lower interest income and profitability for banks. On the other hand, a low inflation rate can reduce the level of borrowing and increase the purchasing power of money, leading to higher interest income and profitability for banks ([Ongore & Kusa 2013](#)). Money supply ratio to GDP is another macroeconomic variable that can affect the financial performance of deposit money banks. changes in money supply ratio to GDP can affect the level of liquidity in the economy, the level of borrowing, and the overall profitability of banks ([Aiyelabegan, Adeoye & Suleiman, 2020](#)). For instance, an increase in money supply ratio to GDP can increase the level of liquidity in the economy and reduce the cost of borrowing, leading to higher interest income and profitability for banks ([Aiyelabegan, et al., 2020](#)). On the other

hand, a decrease in money supply ratio to GDP can reduce the level of liquidity in the economy and increase the cost of borrowing, leading to lower interest income and profitability for banks (Aiyelabegan, et al., 2020).

Numerous empirical studies have investigated the relationship between macroeconomic variables and commercial banks. For example, Irungu (2013) focused on the impact of interest rates on Kenyan deposit money banks, while Simiyu and Ngile (2015) examined the effects of GDP, exchange rates, and interest rates on Nairobi deposit money banks. Combey and Togbenou (2017) explored how GDP growth, real effective exchange rates, and inflation influenced deposit money banks in Togo. These studies highlight the significance of interest rates and exchange rates as commonly studied macroeconomic variables concerning bank performance. In Nigeria, inflation rates, interest rates, and exchange rates are particularly volatile macroeconomic variables (Omorokunwa & Ikponmwosa, 2014; Abdulkareem & Abdulkareem, 2016; Izunobi et al., 2017). Consequently, these variables are frequently examined for their impact on Nigerian commercial banks. Additionally, Adediyiyan (2020) emphasizes that the Central Bank of Nigeria (CBN) employs money supply as a tool to regulate banks within the economy. Therefore, this study has chosen the money supply-to-GDP ratio as a macroeconomic variable of interest. Based on the aforementioned background, this study aims to examine the effects of macroeconomic variables on deposit money banks in Nigeria.

This paper is structured into five sections to accomplish its objective. The first section provides an introduction, the second section presents a review of the relevant literature, and the third section describes the data and methodology employed in the study. Additionally, the fourth section presents the results and discussions, while the fifth and final section encompasses the conclusion and recommendations.

LITERATURE REVIEW

The theoretical framework for this study draws on the Liquidity Preference Theory, the Deflation Theory, and the Monetary Policy Transmission Mechanism. Liquidity Preference Theory, as proposed by Keynes (1936), explains individuals' preference for holding liquid assets, particularly money, due to transactional, precautionary, and speculative motives. This theory provides insights into the behavior of depositors and their demand for liquidity in times of economic uncertainty. It helps to understand the impact of macroeconomic variables, such as interest rates and inflation, on deposit money banks' liquidity position and funding costs. Deflation Theory, as discussed by Fisher (1933), highlights the adverse effects of sustained decreases in the general price level on economic activity. It emphasizes the increased burden of debt, reduced aggregate demand, and potential financial instability associated with deflation. This theory is relevant for examining the impact of macroeconomic variables, particularly inflation and deflation, on deposit money banks' profitability, credit quality, and overall performance (Fisher, 1933).

The Monetary Policy Transmission Mechanism, as explained by Mishkin (2016) and Cecchetti and Schoenholtz (2021), describes the process through which changes in monetary policy, such

as interest rate adjustments, influence the financial system and the behavior of deposit money banks (Mishkin, 2016). This framework helps to understand how changes in macroeconomic variables, influenced by monetary policy decisions, affect bank lending, credit availability, and bank profitability. The channels of transmission, such as the interest rate channel and the bank lending channel, provide insights into the specific mechanisms through which macroeconomic variables impact deposit money banks (Cecchetti & Schoenholtz, 2021).

Based on the foregoing, the most appropriate theory for investigating the impact of macroeconomic variables on deposit money banks in Nigeria is the Monetary Policy Transmission Mechanism. This theory focuses on how changes in monetary policy, such as interest rate adjustments, affect the behavior and performance of deposit money banks. By analyzing the channels through which changes in monetary policy influence the banking sector, researchers can explore the relationship between macroeconomic variables, monetary policy decisions, and the performance of deposit money banks. This framework provides a comprehensive understanding of how macroeconomic factors, such as interest rates, inflation, and other indicators, affect the lending, credit availability, and profitability of deposit money banks in Nigeria.

Several empirical studies have examined the factors influencing the performance of deposit money institutions in achieving their corporate goals. One such study conducted by Irungu (2013) focused on the impact of interest rates on the profitability of Kenyan deposit money banks. The study utilized regression analysis and included all 43 deposit money institutions in the country as the sample. The findings revealed a significant effect of interest rates on the financial performance of these institutions. In a study conducted by Abdullah, Parvez, and Ayreen (2014), both internal and external factors were considered to examine their impact on the performance of deposit money institutions. The study focused on variables related to the banking sector and the overall economy. Two critical metrics, return on assets (ROA) and net interest margin (NIM), were used as dependent variables to assess the performance of deposit money banks. The empirical analysis revealed that various macroeconomic factors, such as bank size, cost efficiency, capitalization, and concentration, also influenced the profitability of these institutions. Therefore, in addition to ROA and NIM, factors related to bank characteristics and macroeconomic conditions should be considered when evaluating the performance of deposit money banks.

In a study conducted by Frederic (2014) on deposit money banks in Uganda, the focus was on identifying the key factors determining their level of success. The research utilized linear multiple regression analysis and collected data from all licensed domestic and foreign deposit money banks between 2000 and 2011. The study found that management effectiveness, asset quality, interest income, capital adequacy, and inflation significantly influenced bank performance. However, it is important to note that the study lacked unit root and serial correlation tests, which could have provided further support for the findings but were not included. Additionally, the study's scope is limited as it was conducted several years ago, and economic circumstances may have changed since then, making any generalizations from the

study less effective.

In a study conducted by [Noman et al., \(2015\)](#) on Bangladeshi banks, the researchers examined both bank-specific and macroeconomic factors influencing profitability. The study analyzed data from 35 banks in Bangladesh over the period of 2003 to 2013. The findings indicated that factors such as credit risk, cost efficiency, GDP growth, and real interest rates had a negative impact on earnings, while factors such as capital adequacy, liquidity, bank size, inflation, and stock market turnover had a positive impact on earnings. Return on assets (ROA) was used as the primary measure of profitability, and the study highlighted that development banks and private commercial banks in Bangladesh tended to be more profitable compared to state commercial banks. However, the study did not include necessary diagnostic tests to validate the model. It emphasized the importance of significant policy implications, particularly related to the monetary regime, in order to enhance the profitability of the banking sector. In a study conducted by [Simiyu and Ngile \(2015\)](#) from 2001 to 2012, the impact of macroeconomic conditions on the financial performance of commercial banks listed on the Nairobi Securities Exchange (NSE) was analyzed. The study employed a panel data analysis using a Fixed Effects model and found significant associations between macroeconomic variables (GDP, exchange rates, and interest rates) and the Return on Assets (ROA) of publicly listed commercial banks. Specifically, real interest rates were found to have a considerable effect on profitability, while the exchange rate had a significant positive impact on profitability. However, it is important to note that the study's scope was not closely aligned with the year of publication, which raises concerns about the potential impact of changes in the economy over time. Therefore, any generalizations drawn from the study may be rendered less useful or applicable.

[Akani, Nwanna, and Mbachu \(2016\)](#) conducted a study to examine the effects of selected macroeconomic variables on the performance of commercial banks in Nigeria. The study utilized annual time series data from the Central Bank of Nigeria (CBN) and the Stock Exchange Fact book covering the period from 1980 to 2014. The findings from the first model indicated that inflation rate, Real Gross Domestic Product, Exchange rate, and Broad Money Supply had positive but statistically insignificant effects on Return on Investment. On the other hand, interest rate and unemployment rate had negative and statistically insignificant effects. In the second model, the findings revealed that inflation rate, interest rate, and exchange rate had positive and significant effects on Return on Assets, while Real Gross Domestic Product, Broad Money Supply, and unemployment rate had negative and statistically insignificant effects. It is worth noting that the study did not include necessary robustness tests to validate the models, which may impact the reliability of the results.

Moreover, [Yakubu \(2016\)](#), the impact of internal and external factors on the profitability of commercial banks in Ghana was examined. The study analyzed the annual financial statements of five commercial banks from 2010 to 2015 using the ordinary least squares regression model. The empirical findings revealed several factors that were positively related to profitability, including bank size, liquidity, capital adequacy, asset management, expense management, and the real interest rate. However, increased economic activity and price inflation were found to

have a negative effect on profitability. The study emphasized that bank-specific variables, rather than macroeconomic factors, were the primary determinants of profitability for commercial banks in Ghana during the period under consideration. However, it acknowledged that macroeconomic considerations still had some relative influence on maintaining high levels of performance. The study highlighted the importance for management of Ghanaian commercial banks to closely monitor the factors impacting their institution's profitability. It is important to note that the scope of the investigation may be insufficient to draw a valid conclusion and make adequate generalizations.

In a study conducted by [Combey and Togbenou \(2017\)](#), the relationship between the profitability of deposit money banks in Togo and the country's major macroeconomic indicators was investigated. By applying the Pool Mean Group estimator, the results show that real GDP growth rate and real effective exchange rate were found to have a negative and statistically significant influence on return on assets, while inflation rate did not impact return on equity. Consequently, real GDP growth, real effective exchange rate, and inflation rate all had a negative impact on the long-term return on equity of financial institutions. In a study conducted by [Bhattarai \(2018\)](#), the impact of bank-specific characteristics and macroeconomic variables on the performance of commercial banks in Nepal between 2011 and 2016 was examined. The study focused on the dependent variable, return on assets (ROA), and considered macroeconomic factors (annual growth of gross domestic product, exchange rate, and inflation) as well as bank-specific variables (default risk, cost per loan asset, and capital adequacy ratio) as independent variables. The significance of both bank-specific and macroeconomic factors in predicting bank performance was analyzed using a regression model. The findings highlighted that the cost per loan asset was one of the most significant factors determining the profitability of Nepal's commercial banks. However, there was limited evidence suggesting that macroeconomic variables had an impact on bank performance, as none of the macroeconomic components were found to be statistically significant. It is important to note that the scope of the study may be insufficient to draw a valid conclusion and make adequate generalizations.

[Chen and Lu \(2021\)](#) conducted a study to examine the impact of macroeconomic variables on bank efficiency using data from Chinese municipal banks. The study focused on the years 2005 to 2014. A stochastic frontier technique was employed to analyze the data. The findings revealed that the efficiency of commercial banks in Chinese cities had a negative correlation with the urban population ratio and a positive correlation with GDP per capita. In comparison to the effects of macroeconomic conditions on bank efficiency in other countries, there was a significant gap between Eastern European countries and others. The study emphasized that macroeconomic conditions in eastern China had a stronger impact on the productivity level of city commercial banks compared to other regions of the country. It is important to note that the study did not conduct any robustness tests. In a study conducted by [Olokoyo et al., \(2020\)](#), the researchers examined the impact of macroeconomic variables on bank performance in Nigeria. The dependent variable in the study was return on assets (ROA), while the independent variables included inflation rate, interest rate, exchange rate, foreign capital flows, and real gross domestic product (GDP). The researchers employed Augmented Dickey Fuller and Unit

Root Tests to analyze the data. The findings indicated that a long-run relationship existed only when return on assets and capital adequacy ratio (CAD) were the dependent variables. The results for both the long-run and short-run relationships revealed that GDP growth rate, interest rate, and trade were the most significant predictors of bank performance in Nigeria. However, it is important to note that the study did not conduct any robustness tests to validate the model used.

DATA AND METHODOLOGY

The study employed an ex-post facto research design to investigate the influence of macroeconomic variables on the financial performance of selected deposit money institutions in Nigeria. Ex-post facto research involves examining preexisting data to identify the factors that contributed to a specific outcome or pattern of behavior. In this study, the researchers analyzed previously existing data to observe the impact of macroeconomic variables on the financial performance of the selected institutions. The use of this research design allowed for exploring the relationship between the variables and the phenomenon under investigation. Moreover, the target population of this study is 24 commercial banks licensed and supervised by the Central Bank of Nigeria (CBN, 2022).

The study selected a sample of seven commercial banks in Nigeria through purposive sampling. The chosen banks included Access Bank, Ecobank, First Bank, Guaranty Trust Bank, Union Bank, United Bank for Africa, and Zenith Bank. These banks were selected based on specific criteria, including their operational activity, listing on the Nigerian Stock Exchange before the year 2000, and their performance during and after the banking consolidation exercise in 2005/2006. The inclusion of these seven banks in the sample allowed for an analysis of their financial performance and the examination of the impact of macroeconomic variables on their operations. Furthermore, the study used annual panel dataset from 2000 to 2021 and the data were from the Central Bank of Nigeria (CBN) statistics bulletin and the Annual Financial Reports of the sampled banks. In the model used for the study, the dependent variable was the financial performance, specifically measured as return on assets (ROA). The independent variables, on the other hand, were macroeconomic variables including the interest rate, exchange rate, inflation rate, and the money supply ratio to GDP. Hence the model is given as:

$$ROA_{it} = \beta_0 + \beta_1 INT_{it} + \beta_2 EX_{it} + \beta_3 INF_{it} + \beta_4 M2GDP_{it} + \varepsilon_t \quad (1).$$

Where ROA is the return on asset and used as a measure of the financial performance of the deposit money banks, INT represents interest rate, EX is the exchange rate, INF denotes inflation rate and M2GDP is the ratio of money supply to GDP. Furthermore, β_0 is the constant, β_1 to β_4 represents the coefficients of the estimated parameters while ε represents the error term. In the estimation however, this study used Panel Autoregressive Distributed Lag (PARDL) model developed by Pesaran and Shin (1999). The dynamic heterogeneous panel regression can be incorporated into the error correction model using the autoregressive distributed lag ARDL (p,q) technique and stated as follows (Loayza and Ranciere, 2006):

$$\Delta ROA_{it} = \beta_1 + \sum_{j=1}^{p-1} \theta_{ij} ROA_{it-j} + \sum_{j=1}^{q-1} \partial_{ij} \Delta IR_{it-j} + \sum_{l=0}^{s-1} \varphi_{ij} \Delta EX_{ij-l} + \sum_{l=0}^{s-1} \varphi_{ij} \Delta INF_{ij-l} + \sum_{l=0}^{s-1} \varphi_{ij} \Delta MSGDP_{ij-l} + \delta_1 ROA_{ij-1} + \delta_2 IR_{ij-1} + \delta_3 EX_{ij-1} + \delta_4 INF_{ij-1} + \delta_5 MSGDP_{ij-1} + \mu_{1it} \quad (2)$$

The study employed the autoregressive distributed lag (ARDL) model in error correction form to estimate the short-run and long-run coefficients of the variables. The ARDL model is a method used to determine whether two variables are cointegrated. The estimators were computed using maximum likelihood estimation. The model considered the first difference operator (Δ) and included a constant term (β_1) as well as coefficients for short-run trends (θ_{ij} , ∂_{ij} , φ_{ij}) and long-run trends (δ_1 , δ_2 , δ_3). The maximum lag lengths were denoted by p , q , and s . The error term was represented by ε_{1it} , accounting for unobserved factors and random disturbances. The ARDL model allowed for assessing the long-run equilibrium and the heterogeneity of the dynamic adjustment process between the variables. The determination of cointegration, as explained by Johansen (1995) and Philipps and Hansen (1990), relied on the variables having the same order of integration. This condition was necessary for establishing a long-term relationship between the variables. Pesaran and Shin (1999) argued that panel ARDL could be used even when the variables have different orders of integration, whether they are $I(0)$ or $I(1)$. This approach enabled simultaneous assessment of short-run and long-run effects using a dataset with large cross-sectional and temporal dimensions. By utilizing a comprehensive dataset spanning multiple time periods, the study aimed to achieve reliable and accurate estimates of the factors sustaining a long-term connection. Despite the potential endogeneity of variables, the ARDL model, especially the PMG (Pooled Mean Group) and MG (Mean Group) estimators, provided consistent coefficients in the presence of cointegration.

RESULTS AND DISCUSSIONS

The results of the impact of macroeconomic variables on the financial performance of deposit money banks are presented and discussed in this section. The analysis begins with a descriptive analysis, and the findings are reported in Table 1.

Table 1: Descriptive Statistics of the Variables

Statistics	ROA	IR	EX	INF	MSGDP
Mean	2.509503	24.44319	204.6690	12.65966	0.193055
Median	2.020000	23.78750	155.7375	12.58919	0.216333
Maximum	22.26000	30.60036	431.2750	18.89722	0.248953
Minimum	-31.06000	18.36250	109.5500	5.419366	0.114087
Std. Dev.	4.496775	3.946792	102.7471	3.725675	0.046590
Skewness	-0.906710	0.050022	1.022912	-0.052625	-0.568218
Kurtosis	27.17449	1.718216	2.553185	2.139986	1.632831
Jarque-Bera	3942.450	11.08873	29.41630	5.035956	21.20259
Probability	0.000000	0.003909	0.000000	0.080622	0.000025
Observations	161	161	161	161	161

Source: Authors computation from EViews output.

Table 1 provides valuable insights into the dataset used for the study, revealing that there are a

total of 161 observations available for each variable. This indicates a substantial amount of data, which enhances the reliability and robustness of the results. Analyzing the mean values of the variables, the study observes that all the variables, including return on assets, interest rate, exchange rate, inflation rate, and money supply, have positive mean values. This suggests that, on average, there has been a positive growth rate for these variables throughout the sample period. By implication for instance, looking at the return on assets, which measures the profitability of commercial banks, the positive mean value indicates that, on average, these banks have experienced positive returns on their assets. This is a positive sign for their financial performance, suggesting that they have been successful in generating profits from their operations.

However, the findings from the analysis indicate that the exchange rate demonstrates the highest standard deviation of 102.7. This high standard deviation suggests a greater level of fluctuation and volatility in the values of the exchange rate variable over the sample period. In other words, the exchange rate has experienced more significant and frequent changes, indicating a higher degree of variability in its distribution. On the other hand, the money supply ratio to GDP exhibits the lowest standard deviation of 0.0466. This implies that there is relatively lower variability or dispersion in the values of the money supply ratio to GDP. The lower standard deviation suggests that the distribution of this variable is more stable and less prone to significant fluctuations. Therefore, while the exchange rate experiences larger swings and fluctuations, the money supply ratio to GDP remains relatively more stable and consistent. These differences in standard deviation highlight the varying degrees of variability and volatility in the two variables, providing important insights into their respective behaviors and potential impacts on the financial performance of commercial banks in Nigeria.

Furthermore, the analysis reveals that return on assets, interest rate, exchange rate, and money supply do not follow a normal distribution. This is evident from the statistically significant probability values at the 1% and 5% significance levels. These results indicate that the data for these variables deviate significantly from a normal distribution. The non-normal distribution of return on assets, interest rate, exchange rate, and money supply imply that these variables may exhibit skewed or heavy-tailed distributions. This explains that financial variables recorded unexpected volatility overtime. In contrast, the inflation rate exhibits a normal distribution as indicated by the significant probability value at the 10% significance level. This suggests that the data for the inflation rate variable closely aligns with a normal distribution. However, from the inferential angle, the estimation begins with correlation matrix and the results are reported in [Table 2](#).

Table 2: Correlation Coefficients of the Model

Variables	ROA	IR	EX	INF	MSGDP
ROA	1.0000				
IR	-0.1275	1.0000			
EX	-0.1003	0.7367	1.0000		
INF	0.0033	0.2612	0.4188	1.0000	
MSGDP	-0.1509	0.6199	0.6768	0.0868	1.0000

Source: Authors computation from EViews output.

Table 2 presents the correlation analysis results, revealing associations between the variables in the study. The interest rate, exchange rate, and money supply ratio to GDP exhibit negative correlations with return on assets, with correlation coefficients of -0.12, -0.10, and -0.15, respectively. This indicates that an increase in these variables is linked to a decrease in return on assets during the sample period. Conversely, inflation demonstrates a positive correlation with return on assets, with a correlation coefficient of 0.003. This suggests that an increase in inflation is associated with an increase in return on assets for the sampled commercial banks. Based on these findings, the study concludes that there is no evidence of severe multicollinearity among the variables. None of the correlation coefficients exceed the threshold of 0.95, indicating that the variables can be included in the regression models for analysis without concerns of severe multicollinearity. In addition, Table 3 summarizes the results of the stationarity analysis conducted on the variables under study. It provides a concise overview of whether the variables exhibit stationary behavior.

Table 3: Panel Unit Root Tests

Variables	Levin, Lin and Chu Test		Im, Pesaran and Shin Test	
	Level	First Diff.	Level	First Diff.
ROA	-2.1851***	-4.8828	-2.858***	-7.0190
INT	1.3941	-10.6806***	0.9147	-8.4994***
EX	-0.1672	-7.2865***	3.3395	-5.4648***
INF	-1.2002	-6.4891***	-1.9732**	-5.6760
MSGDP	-0.1943	-5.8286***	-1.0805	-3.6110***

Note: *** and **significant at 1% and 5% respectively.

Source: Computed by the Author using EViews version 12.

Table 3 presents the results of panel unit root tests conducted using the Levin, Lin and Chu, as well as the Im, Pesaran and Shin testing approaches. The tests indicate that the variables have different orders of integration, with some being stationary at the level value and others requiring first differencing to achieve stationarity. Return on assets and inflation rate are stationary at the level value, while interest rate, exchange rate, and money supply ratio of GDP become stationary after the first difference. Based on these findings, the study concludes that the Panel Autoregressive Distributed Lag (ARDL) model is the most suitable approach for examining the relationships between the variables. The study proceeds to perform optimum lag selection and estimate the long-run and short-run coefficients using the PARDL model. The results of the findings of the Panel ARDL model are reported in Table 4.

The long-run coefficients of the Panel Autoregressive Distributed Lag (PARDL) model, as shown in Table 4, provide insights into the relationship between various variables and the financial performance of Commercial banks (CBs) measured by Return on Assets. The coefficient (0.3426) for the interest rate indicates that, in the long run, a one-percentage-point increase in the interest rate is associated with a positive impact on the financial performance of CBs at 1% level of significant. This implies that higher interest rates may lead to improved profitability and efficiency within the banking sector. This finding contradicts the conclusions of studies conducted by Noman et al. (2015) and Simiyu and Ngile (2015) but aligns with the findings of Irungu (2013).

Table 4: The Long-run coefficients of the PARDL Model

Dependent Variable: Financial Performance of CBs (measured as Return on Assets)

Variables	Coefficients	std. Error	t-Statistics	Prob.
IR	0.3426	0.0452	7.5861	0.0000
EX	-0.0053	0.0019	-2.7693	0.0070
INF	0.0380	0.0562	0.6757	0.5012
MSGDP	-9.4113	3.0026	-3.1344	0.0024
AIC =3.7623, SIC = 5.3126, HQC= 4.3918				

Note: CBs represents Commercial banks

Source: Authors calculation Using EViews Version 12.0.

On the other hand, the result show that there is a negative and statistically significant relationship between exchange rate and financial performance of the deposits money banks in Nigeria. a 1% increase in exchange rate will to decline financial performance of the sampled banks by 0.005%. The result also, suggests that a one-unit increase in the exchange rate, representing a strengthening of the domestic currency (Naira) against the US Dollar, is associated with a decrease in the financial performance of CBs. This negative relationship indicates that a stronger domestic currency can potentially hinder the profitability of CBs.

The result further attested that there is positive and statistically insignificant nexus between inflation rate and financial performance of CBs. This implies that 1% increase in inflation will lead to 0.038% increase in the financial performance of CBs. However, given the lack of statistical significance, justifies that inflation rate has no significant impact on financial performance of the sampled banks. This result aligns with the conclusions of the study conducted by [Combey and Togbenou \(2017\)](#).

Finally, the result attested that money supply ratio of GDP has significant negative impact on financial performance of commercial banks at 1% level. This indicates that a one-unit increase in the ratio of money supply to GDP will lead to 9.411-unit decrease in the financial performance of CBs. This implies that a larger money supply relative to the size of the economy can have adverse effects on the profitability and efficiency of CBs. However, in addition to foregoing, the short-run results are reported in [Table 5](#).

The short-run analysis in [Table 5](#) reveals that the interest rate has a statistically significant negative impact on the financial performance of commercial banks in Nigeria. This implies that an increase in the interest rate can adversely affect banks' profitability by increasing borrowing costs and reducing net interest margins. The negative relationship between interest rates and financial performance may also indicate a decline in loan demand, limiting growth opportunities for banks and potentially impacting asset quality. This finding underscores the importance of interest rate management and its implications for the banking sector.

In contrast, exchange rate, inflation rate, and money supply ratio to GDP do not have a significant impact on commercial banks' performance in the short run. Fluctuations in the exchange rate, changes in the inflation rate, and variations in the money supply ratio to GDP do not directly affect the profitability or financial performance of banks in Nigeria in the short

term. The presence of an error correction term (-0.75) in the analysis indicates a negative and statistically significant relationship. This suggests that deviations from the equilibrium level between macroeconomic variables and banks' performance will be corrected by approximately 75% in the subsequent period. It emphasizes the importance of macroeconomic stability for banks' performance and highlights the need for banks to adapt to changes in macroeconomic conditions to ensure sustained performance and stability.

Table 5: Estimated Short-Run Coefficients of the PARDL Model

Dependent Variable: Financial Performance of CBs				
Variables	Coefficients	std. Error	t-Statistics	P-value
ECT (-1)	-0.7493	0.2399	-3.1240	0.0025
$\Delta(\text{ROA}(-1))$	-0.0188	0.0896	-0.2098	0.8344
$\Delta(\text{IR})$	-0.2916	0.1710	-1.7052	0.0920
$\Delta(\text{IR}(-1))$	-0.0279	0.1175	-0.2370	0.8132
$\Delta(\text{EX})$	-0.0062	0.0108	-0.5729	0.5683
$\Delta(\text{EX}(-1))$	0.0127	0.0119	1.0678	0.2888
$\Delta(\text{INF})$	-0.0751	0.1328	-0.5654	0.5734
$\Delta(\text{INF}(-1))$	-0.1828	0.1419	-1.2887	0.2012
$\Delta(\text{MSGDP})$	2.4978	17.3823	0.1437	0.8861
$\Delta(\text{MSGDP}(-1))$	-4.6495	38.1229	-0.1220	0.9032
C	-2.7634	1.3223	-2.0899	0.0398

Average VIF = 2.26, Autocor. = 0.31 (0.5795), Hetro. = 0.94 (0.4423).

Note: ECT is the Error Correction Term, VIF is the test for multicollinearity, Autocor.

Represents the test for autocorrelation while Hetro. Is Heteroscedasticity test.

Source: Authors' computation Using EViews Version 12.

At the bottom of Table 5 the results of the diagnostic tests is presented and based on these VIF values, there is no indication of severe multicollinearity among the predictor variables. Generally, VIF values below 5 or 10 are considered acceptable, indicating that the predictor variables are not highly correlated with each other. In addition, the tests show that the model is free from serial correlation and heteroskedasticity issues. This is supported by the insignificant probability values obtained from the tests. The absence of these problems strengthens the reliability of the findings and indicates that the model provides a good fit to the data.

CONCLUSION AND RECOMMENDATIONS

In conclusion, the study highlights the significance of interest rates, exchange rates, and the money supply-to-GDP ratio as important macroeconomic factors that impact the financial performance of commercial banks in Nigeria. However, the study did not find a significant relationship between inflation rate and financial performance. In light of the results derived from the study's findings, the following recommendations are made: firstly, banks should closely monitor interest rate trends and adjust their strategies accordingly, considering the potential effects of interest rate changes on profitability and overall financial performance. Secondly, banks should actively manage their exposure to exchange rate fluctuations by adopting hedging strategies or diversifying their currency holdings, thereby minimizing the

adverse effects of exchange rate volatility. Thirdly, despite the absence of a significant relationship between inflation rate and financial performance, commercial banks should maintain prudent monetary policies. This involves closely monitoring inflation trends and implementing appropriate measures to control inflationary pressures, contributing to economic stability. Finally, collaboration with regulatory authorities is crucial for optimizing the money supply-to-GDP ratio. Banks should work closely with regulators to ensure a balanced money supply that supports sustainable economic growth, mitigating risks associated with excessive money supply growth and promoting stability in the banking sector.

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