



# Monetary Policy, Taxation and Return on Assets of Deposit Money Banks Listed in Nigeria

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**Abstract:** This study examines the effect of monetary policy and taxation on the return on assets (ROA) of deposit money banks listed in Nigeria over the period 2005-2024. The study adopts an ex-post facto research design using panel data sourced from the Nigerian Exchange Group, Central Bank of Nigeria, National Bureau of Statistics, and audited financial statements of selected banks. A purposive sampling technique was used to select ten (10) banks with consistent and complete data. The study employs the Panel Autoregressive Distributed Lag (ARDL) model to analyze both short-run and long-run dynamics, given the mixed order of integration among variables. The findings reveal that monetary policy significantly influences bank performance. Specifically, the Monetary Policy Rate (MPR) exhibits a positive and statistically significant effect on ROA in the long run, indicating that higher policy rates enhance banks' profitability through increased interest income. In contrast, the Cash Reserve Requirement (CRR) shows a significant negative effect, suggesting that higher reserve requirements constrain banks' ability to generate earnings. However, Liquidity Ratio (LR), Loan-to-Deposit Ratio (LDR), and government tax revenue (GT) do not significantly affect ROA in the long run. In the short run, MPR and government tax revenue negatively and significantly affect ROA, reflecting immediate adjustment costs and fiscal pressures on banks' profitability. The error correction term confirms the existence of a stable long-run relationship, with a relatively high speed of adjustment to equilibrium. Overall, the study concludes that monetary policy plays a more critical role than taxation in influencing the profitability of deposit money banks in Nigeria. The study recommends that policymakers ensure consistency in monetary policy implementation to enhance banking sector stability, while banks should improve asset utilization efficiency and risk management practices to sustain profitability.

**Keywords:** Bank Performance, Deposit Money Banks, Monetary Policy, Nigeria, Return on Assets, Taxation

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## INTRODUCTION

The Nigeria banking sector, like any other banking sector in the world plays the role of financial intermediation. Financial intermediation is an act of collecting funds from depositors by financial lenders/institutions and then lending them to borrowers. That is, it is a process where the people with excess funds (surplus units) give banks or any other financial institution, and the banks or other financial institutions offer credit to those individuals/organisations who require the funds (deficit units) for personal or business reasons. Financial intermediation also cuts across making payments, receivables, transfers and guarantees by the banks on behalf of their customers. Financial intermediation often involves mobilizing the financial savings and channeling them to borrowers through

specialized institutions known as banks. These specialized institutions are also called financial markets licensed to accept those deposits and lend them to the business and households at given interest rates over a specified period. Cardinal in the financial intermediation business are the deposit money banks.

Monetary policy implemented primarily through instruments such as Monetary policy rates, cash reserve requirements, liquidity ratio and loan to deposit ratio aims to achieve price stability, sustainable growth, and financial stability. Taxation constitutes a second, often under-examined channel through which public policy affects bank performance. Taxes (corporate income tax, withholding taxes, value-added taxes on services, and specific levies) influence banks' after-tax profitability, investment incentives, product pricing, and risk-taking behaviour.

The financial performance of deposit money banks, often measured through indicators such as return on assets (ROA, is intricately linked to the policy environment. In the Nigerian context, periods of unstable monetary and fiscal policies have been associated with volatility in inflation, exchange rate fluctuations, and credit risks, which in turn affect the profitability and overall stability of banks.

Despite the efforts of the Central Bank of Nigeria (CBN) to manage liquidity and inflation through monetary instruments such as the cash reserve ratio (CRR), monetary policy rate (MPR), liquidity ratio (LR), and Loan to Deposit Ratio (LDR), inconsistencies in policy implementation and timing often hinder banks' ability to lend profitably and manage risk. Similarly, fiscal policies such as excessive government taxation have been linked to crowding out banks' retained earnings, thereby constraining banks' capacity to grow and also limits banks' ability to lend on large ticket transaction because of the impacts the single obligor limit and subsequently limit the ability to earn additional profit.

The study contributes to the literature

## **LITERATURE REVIEW**

### **Conceptual Review**

#### ***Return on Assets***

Return on asset is a measure of the operational efficiency of a bank. Banks inevitably continue to attract significant attention from the public and scrutiny by financial regulators as there is a growing need to evaluate banks more efficiently. Not only supervising institutions, regulators, and bank management bodies but also clients of banks, are becoming increasingly concerned about the stability and sustainability of these financial institutions. Therefore, it is necessary to measure the banks' performance to determine their contribution to business development. The first key measure is the Return on Assets ratio, also known as ROA. It is the most commonly used benchmark for bank profitability since it measures the company's return on investment in a format that is easily comparable with other institutions. (Ramona and Christoph, 2017)

ROA is a ratio of net income produced by total assets during a period of time. In other words, it measures how efficiently a bank can manage its assets to produce profits. Investors will be interested in saving or investing in banks that are performing well.

### ***Monetary Policy and Fiscal Policy***

Monetary Policy refers to the activities undertaken by central banks to influence the quantity of money and credit in an economy. The primary objectives of monetary policy include: Price stability: maintaining low and stable inflation rates, typically around. Maximum employment: achieving a high level of employment and economic output. Central banks, have well defined and clearly stated goals for monetary policy. Fiscal Policy refers to the government's decisions regarding taxation and spending. The main objectives of fiscal policy include: promoting stable and sustainable economic growth. Reducing poverty and income inequality. Macroeconomic stabilization: smoothing out economic fluctuations and mitigating the impact of recessions. While monetary policy operates through influencing the money supply and interest rates, fiscal policy works by directly affecting aggregate demand through government spending and taxation. Both policies aim to create an economic environment characterized by stable growth, low inflation, and high employment levels. (Tereza et al., 2022)

### **Theoretical Review: Financial Intermediation Theory**

The originator of modern Financial Intermediation Theory is generally considered to be Douglas W. Diamond, who formalized the theory in his groundbreaking 1984 paper. The Financial Intermediation Theory explains the role of financial institutions, particularly banks in channeling funds from surplus units (savers) to deficit units (borrowers), helping overcome market imperfections like asymmetric information, transaction costs, and risk management. At its core, the theory argues that banks exist because they perform three critical functions: Reduce transaction and search costs, Mitigate information asymmetry (i.e., adverse selection and moral hazard), and Provide liquidity transformation (i.e., turning short-term deposits into long-term loans).

This theory underscores the importance of banks in the economy. Giving credence to how banks drive economic growth. As a business venture, whilst banks play the important role of financial intermediation, they are expected to make profit in order to expand and to maximize the shareholders' wealth.

### **Empirical Review**

El Maude et al. (2017) in their study on Determinants of Non-Performing Loans in Nigeria's Deposit Money Banks covered a period of 5 years (2010 to 2014). They made sue of 10 out of the 15 quoted banks on the exchange in Nigeria on a cross sectional basis. The research work was focused the determinants of non-performing loans in Nigeria. Using descriptive statistics, coefficient of correlations and multiple regression, the team concluded that there is a strong relationship between non-performing loan and loan to deposit ratio (monetary policy).

Washeka and Asif (2016) conducted empirical research into the factors that are responsible for non-performing loans in Bangladesh. In the research work, they investigated the response of non-performing loans of banks to macroeconomic variables using multiple regression and correlation analysis as their method of data analysis. Their aim was to ascertain the most significant variable responsible for non-performing loans, and also to test

the correlation between the various variables. They concluded that thirteen variables (four macroeconomic factors and nine bank specific factors) have significant effect on non-performing loans of banks.

Anthony and Nakita (2018) researched into Determinants of non-performing loans: evidence from commercial banks in Barbados. They were motivated by the fact that from the onset of the global financial crisis in 2008, the financial indicators of the commercial banking sector worsened with credit quality in particular being noteworthy. They stated that, the non-performing loans to total loans ratio increased from a historic low of 2.9% in 2007 to 12.9% in 2012. Given the adverse effect of nonperforming loans on the financial performance of commercial banks, there has been a proliferation of studies on the determinants of non-performing loans over the years. Their paper examined the bank-specific and macroeconomic determinants of non-performing loans of commercial banks in Barbados over the period 1991-2015 using multiple regression analysis. The empirical results revealed that the bank-specific factors: return on equity, return on assets, capital adequacy ratio and loan to deposit ratio are significant determinants of non-performing loans, while the macroeconomic variables exerting significant influence are GDP growth, unemployment and interest rate.

Mehmet (2015) researched on The Effect of Macroeconomic Variables on Non-performing Loan Ratio of Publicly Traded Banks in Turkey. The study examined the effect of macroeconomic variables (commercial loan interest rates and public debt stock/GDP ratios) on the consolidated non-performing loan ratio of banks involved in Borsa Istanbul (BIST) XBANK index in quarterly basis during 2002-2013 period. Adopting the regression analysis model, the result of econometric analysis revealed that changes in non-performing loan ratio can be explained by above mentioned macroeconomic variables.

Ogechi and Fredrick in their research work titled Macroeconomic Determinants of Non-Performing Loans in Nigeria: An Empirical Analysis. The result of their findings revealed that inflation and employment rate have a positive relationship with Non Performing Loans, while lending rate, GDP, and unemployment rate have a positive and significant relationship with NPL. Of the six macroeconomic variables used in the study, it can be observed that only lending rate, GDP, and UR determine NPL in Nigeria while GDP growth rate, inflation, and exchange rate have a positive relationship with NPL but do not influence or determine NPL in Nigeria. The policy implication of this study is that the monetary authorities should ensure that the lending rate charged on loans by deposit money banks is reasonable to enable borrowers to repay the borrowed fund. Finally, the government is advised to direct its monetary and fiscal policies towards reducing unemployment by creating an enabling environment conducive for business growth through the provision of social and infrastructural facilities.

Zamira and Robert (2018) on their research titled The Impact of Non-Performing Loans Ratio on Banking Profitability in the Albanian Banking System adopted linear regression to interrogate the relationship between non-performing loans and the performances of banks in Albanian banking system. Using ROE and ROA as the proxies to measure performances of banks, the statistical analysis in the study showed a negative impact of the NPLR indicator on the two indicators of bank profitability in our country.

Philemon and Alex (2018) wrote on Effects of Selected Monetary Policies On Loans Portfolio Performance Among Commercial Banks in Kenya. The researcher used multiple

regression to perform their test across 30 banks in Kenya. The findings of the study showed that there was no significant relationship between open market operations, central bank rate, Kenya bankers' reference rate and loans portfolio performance. The study recommended that central banks should reevaluate the policies governing open market operations especially outright transactions and reserve transactions, that central bank should continue to improve their monetary policies. The study also recommended that central bank rate and minimum reserve should be reduced and much with the prevailing inflation rate. It is necessary that further study be done on the effect of open market operations on loans portfolio performance among commercial banks.

The result of "The effect of monetary policy on credit risk: evidence from the MENA region" countries by Sherif et al. (2020) showed that the relationship between monetary policy and credit risk is positive and significant to a certain threshold, 6.3. If the lending interest rate is higher than 6.3, this increases the credit risk in the banking sector, because increasing the lending interest rate imposes huge burdens on the borrowers, and, therefore, the bad loans and nonperforming loans become more likely. Thus, the MENA countries need to decrease the lending interest rate to be less than 6.3 to reduce the effect of monetary policy on credit risk. Further, these results are qualitatively robust regarding the inclusion of additional control variables, using alternative threshold variables and further endogeneity checks of the credit risk, such as Risk premium and the squared term of the lending interest rate. The results of taking the risk premium and the squared term of the lending interest rate as a threshold served the analysis and confirmed the positive relationship between monetary policy and credit risk above a certain threshold. As for the risk premium, the relationship below the threshold was negative and significant.

Using Structural Vector Autoregression (SVAR) model to test the impact of monetary policy (lending rate, Treasury bills, broad money supply, and the real effective exchange rate on non-performing loans, Nwanja et al., (2024) revealed significant and varying impacts of government monetary policy instruments on NPLs. Government Treasury bills emerge as the most influential instrument which consistently showed a negative impact on Non Performing Loans. The Lending rates displayed a complex relationship, initially reducing NPLs but eventually contributing to their increase in the long run. Real effective exchange rate showed a positive relationship with NPLs, indicating that currency depreciation leads to increased NPLs. Broad money supply exhibits a slight but growing negative impact on NPLs. Their findings indicated a complex relationship between monetary policy and NPLs in Nigeria, suggesting the need for the monetary authority to adopt a more dynamic approach to monetary policy, considering the impacts of the various monetary policy instruments on NPLs, in the immediate and in the long-run.

Viswanadham and Nahid (2015) wrote on Determinants of Non Performing Loans in Commercial Banks: A Study of NBC Bank Dodoma Tanzania. Using time series data to analyse their data, Interest rate, GDP, concentration of lending activities, bank's loan supervision capacity and economic condition were investigated, and the results suggested that interest rate, GDP, bank's loan supervision capacity and economic condition influenced the level of NPLs. However, the results did not reveal that concentration of lending activities increase the level of NPLs

Irena (2018) conducted a research aimed at examining and quantifying the impact of macroeconomic determinants on non-performing loans (NPLs) in 11 selected Central and

Eastern European (CEE) countries in the period 1999-2015. The empirical evidence was based on aggregate annual panel data collected from the Bluenomics. Panel regression with fixed effects analysis identified unemployment as the most important macroeconomic factor for NPLs - the relation between unemployment rate and NPLs is proportional. Their next results confirm negative influence of inflation, economic growth and exchange rate on NPLs. The impact of lending interest rate is positive and in line with the expectations.

Yamunah et al. (2019) conducted a research on The Study on Factors That Influencing Banks' Non-Performing Loans in Malaysia. The objective of the research was to identify the factors that were responsible for NPL in Malaysia. The research period covered a 10 year between 2009 and 2018. Their findings have shown the factors such as inflation, unemployment and interest rate has an influence in increasing the non-performing loans.

## **METHODOLOGY**

The study investigated the effect of monetary policy, taxation and return on asset of deposit money banks listed in Nigeria from 2005-2024. The study made use of ex-post facto research design. An ex-post facto investigation seeks to reveal possible relationship by observing an existing condition or a state of affairs and searching back in time for plausible contributing factors. Specifically, the nexus of this research design is on the premise that this study relied on historical data that was obtained from the database of the Nigeria exchange group, local financial regulators, the national bureau of statistics, and audited financials of banks.

### **Population of the Study**

The population of the study comprises all deposit money banks listed on the Nigerian Exchange Group (NGX) and operating in Nigeria during the study period. As at the period covered by this study, there are fourteen (14) listed deposit money banks in Nigeria. These banks are regulated by the Central Bank of Nigeria and constitute the core of the Nigerian financial system through their financial intermediation, credit creation, and transmission of monetary policy. The listed deposit money banks vary in size, ownership structure, and operational scope, providing a comprehensive population for examining the effect of taxation on bank performance in Nigeria.

### **Sample Size and Sampling Techniques**

The sample size consists of ten (10) listed deposit money banks, selected from the population of fourteen (14) banks. The sampled banks are Zenith Bank Plc, First City Monument Bank (FCMB) Plc, United Bank for Africa (UBA) Plc, Ecobank Nigeria Plc, Wema Bank Plc, Stanbic IBTC Bank Plc, Access Bank Plc, Fidelity Bank Plc, First Bank of Nigeria Holdings Plc, Guaranty Trust Bank (GTB) Plc, and Sterling Bank Plc. A purposive sampling technique was adopted in selecting the sample. This technique was considered appropriate because only banks with complete, consistent, and publicly available annual financial statements throughout the study period (2005-2024) were included. Banks with incomplete data or those affected by mergers, acquisitions, or delisting during the period were excluded to avoid structural breaks that could bias the econometric results. The selected banks represent a substantial proportion of the Nigerian banking sector in terms of asset base,

profitability, and market capitalization, thereby ensuring robustness and generalizability of the study findings.

### Model Specification

#### *Model to Examining the Effect of Monetary Policy and Taxation on Return on Assets of Deposit Money Bank Listed in Nigeria*

In determining the relationship between government policy and the return on assets of deposit money bank listed in Nigeria.

$$ROA_{it} = f (MPR_{it}, CRR_{it}, LR_{it}, LDR_{it}, GT_{it})$$

The structural form equation of the model is given as,

$$ROA_{it} = b_0 + b_1MPR_{it} + b_2CRR_{it} + b_3LR_{it} + b_4LDR_{it} + b_5GT_{it} + \varepsilon_{it} \quad (3.4)$$

Where:

ROA = Return on Assets

MPR = Monetary Policy Rate

CRR = Cash Reserve Requirement

LR = Liquidity Ratio

LDR = Loan to Deposit Ratio

GT = Government tax revenue

i is Banks Specific

t is the time series

The Panel ARDL approach, as developed by Pesaran, Shin, and Smith (1999), is appropriate because it accommodates variables integrated of order I(0) and I(1), captures dynamic adjustments, and allows for heterogeneity across cross-sectional units (banks).

#### *Panel ARDL (p, q<sub>1</sub>, q<sub>2</sub>, q<sub>3</sub>, q<sub>4</sub>, q<sub>5</sub>) Specification*

The dynamic Panel ARDL model is expressed as:

$$\Delta ROA_{it} = b_0 + b_1\Delta MPR_{it-j} + b_2\Delta CRR_{it-j} + b_3\Delta LR_{it-j} + b_4\Delta LDR_{it-j} + b_5\Delta GT_{it-j} + \varepsilon_{it}$$

In Panel ARDL Error Correction Representation (PMG Form), the error correction representation of the Panel ARDL model is written as:

$$\begin{aligned} \Delta ROA_{it} = & b_0 + b_1\Delta ROA_{it-j} + b_2\Delta MPR_{it-j} + b_3\Delta CRR_{it-j} + b_4\Delta LR_{it-j} + b_5\Delta LDR_{it-j} \\ & + b_6\Delta GT_{it-j} + \phi_1ROA_{it-j} + \phi_2\Delta MPR_{it-j} + \phi_3\Delta CRR_{it-j} + \phi_4\Delta LR_{it-j} \\ & + \phi_5\Delta LDR_{it-j} + \phi_6\Delta GT_{it-j} + v_{it} \end{aligned}$$

#### *Measurement of Variable*

**Table 1:**

Variables	Description	Measurement	Source(s)
Return on Assets	Return on Assets (ROA) is a financial ratio that indicates how profitable a company is relative to its total assets. It measures how efficiently a company uses its assets to generate earnings.	It is calculated by dividing the profit after tax of a period by the total assets of the firm for the same period.	Nigerian Exchange Limited 2024
Monetary Policy Rate	This is the cost of borrowing money from the central bank like the Central Bank of Nigeria (CBN) for example, by banks. This rate is very important as the CBN uses it to attempt to control inflation.	Determined by the Central Bank	Central Bank of Nigeria
Cash Reserve Requirement	Cash Reserve Ratio (CRR) is a regulatory requirement set by a country's central bank that mandates commercial banks to hold a certain percentage of their total net demand and time liabilities (NDTL) as reserves in the form of cash with the central bank.	(Net Demand and Time Liabilities/ Cash Reserves with Central Bank) $\times$ 100	Central Bank of Nigeria
Liquidity Ratio	The liquidity ratio of a bank measures its ability to meet short-term obligations without raising external capital. It evaluates how well a bank can cover its short-term liabilities with its liquid assets (cash or assets easily convertible to cash).	Short-Term Liabilities/Liquid Assets	Central Bank of Nigeria
Loan to Deposit Ratio	LDR is a ratio that describes the comparison between a credit issued by a bank and the total third party funds collected by a bank. It measures what proportion of the bank's funding (deposit and borrowing) is deployed into risk asset (loan)	Total loan divided by deposit and borrowing	Central Bank of Nigeria
Tax Revenue	Government tax revenue includes income taxes, corporate taxes, sales taxes (VAT/GST), property taxes, and customs duties. The focus of this research is on the corporate taxes (Company income tax, education tax, technology tax, police trust funds).	Government Tax revenue	National Bureau of Statistics

Source: Researcher's composition

## DATA ANALYSIS, RESULT AND DISCUSSION

**Table 2: Descriptive Statistics of monetary policy, taxation and return on assets**

	Mean	Maximum	Minimum	Std. Dev.	Skewness
ROA	2.049796	9.490000	-17.05	2.139830	-3.1908
MPR	12.74107	27.50000	6.000000	4.370015	1.542083
CRR	16.93878	50.00000	0.000000	13.28025	0.401412
LR	51.66633	104.2000	26.39000	17.64529	1.285919
LDR	65.11276	96.82000	37.56000	15.01054	0.162776
GT	2818.832	7944.560	0.000000	1980.473	0.796330

Source: Author's Computation (2026); Where: Return on Assets (ROA), Monetary Policy Rate (MPR), Cash Reserve Requirement (CRR), Liquidity Ratio (LR), Loan to Deposit Ratio (LDR), Government tax revenue (GT)

Table 2 ROA has a low mean value of 2.05, implying modest profitability relative to total assets, while the negative minimum value (-17.05) reflects periods of losses among some banks. The dispersion in ROA, as indicated by its standard deviation (2.14), suggests variations in asset utilization efficiency across banks and time. Monetary Policy Rate (MPR) has a mean of 12.74 percent, indicating a generally tight monetary stance over the study

period. The range from 6.00 to 27.50 percent and a standard deviation of 4.37 reflect notable adjustments in policy rates in response to macroeconomic conditions. The Cash Reserve Requirement (CRR) records a mean of 16.94 percent, with a wide dispersion (standard deviation of 13.28), suggesting frequent policy interventions by the monetary authority to regulate banks' liquidity and credit creation. The Liquidity Ratio (LR) has a mean value of 51.67 percent, indicating that banks, on average, maintained liquidity levels above regulatory thresholds, although the variation between minimum and maximum values points to differences in liquidity management strategies across banks. The Loan-to-Deposit Ratio (LDR) shows a mean of 65.11 percent, suggesting moderate credit expansion relative to deposit mobilization, with relatively lower variability compared to other monetary indicators.

Government tax revenue (GT) records a mean value of 2,818.83, with a wide range from zero to 7,944.56 and a large standard deviation (1,980.47), reflecting significant fluctuations in tax revenue performance over the period. This variability may be attributed to changes in tax policy, economic cycles, and compliance levels, which have implications for the fiscal environment within which banks operate.

### Correlation Matrix

Table 3 presents the correlation coefficients among the variables used to analyze the effect of monetary policy, taxation on return on assets of deposit money banks in Nigeria. The matrix shows the direction and strength of relationships between variables, with correlation values ranging from -1 to +1.

### Correlation Matrix

**Table 3: Correlation Matrix of monetary policy, taxation and return on assets**

	ROA	MPR	CRR	LR	LDR	GT	VIF
ROA	1						
MPR	0.187	1					7.461467
CRR	0.070	0.629	1				4.997420
LR	0.100	0.199	0.270	1			1.206090
LDR	0.006	-0.227	-0.295	0.006	1		1.176165
GT	-0.136	-0.060	0.344	0.349	-0.271	1	2.473317
	3.463						

Source: Author's Computation (2026); Where: Return on Assets (ROA), Monetary Policy Rate (MPR), Cash Reserve Requirement (CRR), Liquidity Ratio (LR), Loan to Deposit Ratio (LDR), Government tax revenue (GT)

Table 3 presents the pairwise correlation coefficients among bank performance indicators, monetary policy variables, and government tax revenue return on assets of deposit money banks in Nigeria. The correlation results show that most of the relationships among the variables are weak to moderate, suggesting limited linear dependence. ROA (0.234), implying that improvements in banks' interest margins are moderately associated with higher profitability indicators. The correlation between NIM and Non-Performing Loans

(NPL) is almost zero (0.009), indicating that changes in interest margins are largely independent of loan default behavior within the sample period.

Return on Assets (ROA) is positively correlated (0.290), which is expected, as it measure profitability from different perspectives. However, the magnitude of the relationship remains modest, suggesting that variations in equity returns are not driven solely by asset profitability. NPL shows weak and mostly negative correlations with ROA (-0.132) consistent with theoretical expectations that deteriorating asset quality reduces profitability, although the low coefficients indicate that this effect is not excessively strong in the data.

The VIF values reported further confirm the non-existence of multicollinearity. All VIF values range between 1.18 and 7.46, which are below the critical cutoff of 10 suggested in the econometric literature which indicated low severe multicollinearity (Gujarati and Porter, 2009; Wooldridge, 2016). The mean VIF of 3.463 also falls within the acceptable range, reinforcing the conclusion that the explanatory variables are sufficiently independent. Therefore, the correlation matrix and VIF diagnostics jointly indicate that multicollinearity is not a serious concern in the model, and the estimated regression coefficients can be considered reliable and efficient for subsequent econometric analysis.

## Pre-estimation Test

### Stationarity Test

The pre-estimation test residual are presented in table 4.2a and table 4.2b

**Table 4: Panel Unit Root Test**

	Im, Pesaran and Shin W-stat			ADF Test		
	Level	First Diff.	Integration	level	First Diff.	Integration
NIM	-4.109	-	<i>I(0)</i>	-5.084	-	<i>I(0)</i>
ROA	-3.782	-	<i>I(0)</i>	-5.057	-	<i>I(0)</i>
ROE	-2.038	-	<i>I(0)</i>	-3.415	-	<i>I(0)</i>
NPL	-5.467	-	<i>I(0)</i>	-5.277	-	<i>I(0)</i>
PAT	-3.905	-	<i>I(0)</i>	2.218	-6.810	<i>I(1)</i>
MPR	6.701	-3.908	<i>I(1)</i>	7.239	-4.107	<i>I(1)</i>
CRR	8.829	-7.962	<i>I(1)</i>	8.276	-7.411	<i>I(1)</i>
LR	-2.970	-	<i>I(0)</i>	-3.194		<i>I(0)</i>
LDR	-1.103	-10.1148	<i>I(1)</i>	-1.226	-8.831	<i>I(1)</i>
GT	-1.043	-9.136	<i>I(1)</i>	-1.1861	-8.214	<i>I(1)</i>

Source: Author's Computation (2026); Where: Return on Assets (ROA), Monetary Policy Rate (MPR), Cash Reserve Requirement (CRR), Liquidity Ratio (LR), Loan to Deposit Ratio (LDR), Government tax revenue (GT)

Table 4 a reports the results of the panel unit root tests using the Im, Pesaran and Shin (IPS) W-statistic and the Augmented Dickey-Fuller (ADF) Fisher-type test to examine the stationarity properties of the variables employed in the study. The results indicate that Return on Assets (ROA) is stationary at levels under both the IPS and ADF tests, as reflected by their statistically significant test statistics at level. Consequently, these variables are

integrated of order zero,  $I(0)$ , implying that their means and variances are constant over time and that they do not exhibit unit root trend. This suggests that short-run shocks to these bank performance and liquidity indicators are transitory and do not have permanent effects. Monetary Policy Rate (MPR) and Cash Reserve Requirement (CRR) are found to be non-stationary at level but stationary at first difference under both IPS and ADF tests, indicating that they are integrated of order one,  $I(1)$ . Similarly, Loan-to-Deposit Ratio (LDR) and Government Tax Revenue (GT) are non-stationary at level but become stationary after first differencing, confirming their integration at order one. In summary, the panel unit root results reveal a mixture of  $I(0)$  and  $I(1)$  variables, with none of the series integrated of  $I(2)$ . This mixed order of integration justifies the use of panel estimation techniques that can accommodate both stationary and non-stationary variables, such as panel Autoregressive Distributed Lag Model (ARDL) also known as Pool Mean Group (PMG).

**Table 4.2c: Pedroni Residual Cointegration Test on monetary policy and taxation and return on asset of deposit money bank listed in Nigeria**

	within-dimension		between-dimension	
	Statistic	Prob.	Statistic	Prob.
Panel v-Statistic	-2.054395	0.9800	-	-
Panel rho-Statistic	1.755547	0.9604	2.220258	0.9868
Panel PP-Statistic	-5.183544	0.0000	-7.585729	0.0000
Panel ADF-Statistic	-5.146282	0.0000	-6.004119	0.0000

Source: Author's Computation (2026); Where: Return on Assets (ROA), Monetary Policy Rate (MPR), Cash Reserve Requirement (CRR), Liquidity Ratio (LR), Loan to Deposit Ratio (LDR), Government tax revenue (GT)

Table 4.2c reports the Pedroni residual cointegration test results examining the long-run relationship among monetary policy variables, taxation, and return on asset (ROA) of listed deposit money banks in Nigeria. The results are presented for both within-dimension (panel statistics) and between-dimension (group statistics). The Panel v-statistic and Panel rho-statistic are statistically insignificant, as indicated by their high probability values, suggesting a failure to reject the null hypothesis of no cointegration under these specific statistics. However, the Panel Phillips-Perron (PP) and Panel Augmented Dickey-Fuller (ADF) statistics are negative and highly significant at the 5% level under the within-dimension framework. Likewise, the Group PP and Group ADF statistics under the between-dimension approach are also statistically significant at the 5% level. According to Pedroni (1999, 2004), evidence of cointegration is established when a majority of the statistics particularly the PP and ADF statistics, which are robust to serial correlation and cross-sectional heterogeneity reject the null hypothesis of no cointegration.

The significance of both the within- and between-dimension PP and ADF statistics implies the existence of a stable long-run equilibrium relationship between monetary policy, taxation, and return on assets of deposit money banks in Nigeria (Pedroni, 2004; Baltagi, 2008). Consequently, the presence of cointegration justifies the estimation of long-run and short-run dynamics using panel cointegration-based techniques.

**Table 5: Estimated Model on monetary policy, taxation and return on assets of deposit money bank listed in Nigeria**

Dependent Variable: D(ROA)				
Method: ARDL				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
<b>Long Run Equation</b>				
MPR	0.455218	0.106129	4.289275	0.0000
CRR	-0.098269	0.021929	-4.481250	0.0000
LR	0.003789	0.007949	0.476666	0.6344
LDR	0.008302	0.009200	0.902361	0.3686
GT	0.240350	0.148091	1.622992	0.1071
<b>Short Run Equation</b>				
ECT (-1)	-0.632405	0.073442	-8.611004	0.0000
D(MPR)	-0.119174	0.046623	-2.556107	0.0118
D(CRR)	0.042727	0.028287	1.510507	0.1334
D(LR)	-0.005978	0.004724	-1.265471	0.2081
D(LDR)	-0.035112	0.022872	-1.535156	0.1273
D(GT)	-0.235180	0.046296	-5.079933	0.0000
C	-3.296000	0.567002	-5.813027	0.0000
<b>Diagnostic</b>				
Log likelihood	-649.3460			
F-statistics	6.8522 (0.0000)			
Root MSE	2.506299			
Observation	196			

Source: Author's Computation (2026); Where Return on Assets (ROA), Monetary Policy Rate (MPR), Cash Reserve Requirement (CRR), Liquidity Ratio (LR), Loan to Deposit Ratio (LDR), Government tax revenue (GT)

### Long Run Effect

Table 5 present the ARDL Estimated Results on monetary policy, taxation and return on assets of deposit money bank listed in Nigeria. The long-run equation of the ARDL model reveals that Monetary Policy Rate (MPR) coefficient is positive and statistically significant (0.455,  $p = 0.000$ ), implying that a 1% increase in MPR increases ROA by approximately 0.46% in the long run. This suggests that higher policy rates enable banks to expand their interest income and improve asset profitability over time, possibly through adjustments in lending rates.

Conversely, the Cash Reserve Requirement (CRR) has a negative and statistically significant effect on ROA (-0.098,  $p = 0.000$ ). This indicates that a 1% increase in CRR reduces ROA by about 0.10% in the long run, reflecting that higher reserve requirements reduce funds available for earning assets, thereby constraining profitability.

The Liquidity Ratio (LR) (0.0037,  $p = 0.634$ ) and Loan-to-Deposit Ratio (LDR) (0.008,  $p = 0.367$ ) are not statistically significant in the long run, implying that liquidity management and credit deployment do not significantly affect ROA in the long-run. Government tax revenue (GT) also shows an insignificant positive coefficient (0.240,  $p = 0.107$ ), suggesting that taxation does not have a statistically significant long-run effect on ROA at the 5% level.

### Short-Run Results

In the short run, the error correction term (ECT-1) is negative and statistically significant (-0.632,  $p = 0.000$ ), confirming the existence of a long-run relationship among the variables and indicating that about 63.2% of any short-run disequilibrium in ROA is corrected within one period. The short-run coefficient of MPR is negative and significant (-0.119,  $p = 0.012$ ), implying that an increase in the policy rate initially reduces ROA. Changes in CRR, LR, and LDR are not statistically significant in the short run, suggesting limited immediate effects on return on asset. However, the change in government tax revenue ( $\Delta GT$ ) is negative and significant (-0.235,  $p = 0.000$ ), indicating that increases in tax revenue exert a contractionary effect on ROA in the short run, possibly due to higher tax burdens or tighter fiscal conditions.

### *Model Diagnostics and Decision on Hypothesis Two:*

The F-statistic (6.8522,  $p = 0.000$ ) indicates that the overall model is statistically significant, confirming the joint significance of the explanatory variables. The Root MSE value of 2.506 indicates reasonable model accuracy. Given the statistically significant, the null hypothesis ( $H_0$ ) is rejected. Therefore, monetary policy and taxation significantly affect the return on assets of listed deposit money banks in Nigeria. at the 5% significance level.

### *Discussion of Findings for Objective One*

Estimated result in assessment of the effect of monetary policy, taxation and return on assets of deposit money bank listed in Nigeria. The ARDL results indicate that monetary policy significantly affects the return on assets (ROA) of deposit money banks in Nigeria. In the long run, the Monetary Policy Rate (MPR) positively influences ROA, meaning that higher policy rates increase banks' asset profitability over time, likely through improved interest income. Conversely, the Cash Reserve Requirement (CRR) negatively affects ROA, showing that higher reserve requirements reduce the funds available for earning assets and thus lower profitability. Liquidity Ratio (LR), Loan-to-Deposit Ratio (LDR), and government tax revenue (GT) are not statistically significant in the long run, suggesting that liquidity management, credit deployment, and taxation do not significantly impact ROA in the long-run equilibrium. In the short run, MPR and CRR both negatively affect ROA, reflecting immediate cost pressures and operational adjustments.

The long-run positive relationship between MPR and ROA is supported by studies such as Thany et al. (2017) and Mabati and Onsero (2020), which found that monetary policy variables, including interest rates, significantly influence bank profitability. Similarly, Onogah (2024) found that monetary policy affects commercial bank performance, supporting the assertion that policy rates impact bank profitability. Additionally, the negative long-run effect of CRR on ROA aligns with the theoretical expectation that higher reserve requirements reduce lending capacity and profitability. This finding is consistent with the general empirical view that CRR constrains banks' ability to generate interest income.

However, the insignificant effect of taxation (GT) on ROA contradicts the findings of Okitiakpe and Ehiedu (2025) and Ogbaragu and Offor (2024), who reported that taxation

negatively affects firm profitability and bank ROA, respectively. These studies suggest that higher tax burdens reduce profitability, which is not supported in the present study. Likewise, the insignificance of liquidity and credit deployment variables (LR and LDR) differs from the findings of Alexander et al. (2020), who reported a positive relationship between liquidity ratio and bank profitability. This divergence may be due to differences in country-specific banking structures, regulatory environments, and the period of study, as well as the unique monetary and fiscal dynamics in Nigeria that may have altered the transmission of these variables to bank profitability.

### **SUMMARY AND RECOMMENDATIONS**

This study examined the effect of monetary policy, taxation on return on assets of deposit money banks listed in Nigeria. The study reveals that ROA is significantly affected by monetary policy variables and shows sensitivity to liquidity and reserve requirements. Therefore, the study recommended banks should focus on improving operational efficiency and optimal utilization of assets by investing in technology, cost control measures, and efficient credit allocation.

The findings show that monetary policy instruments particularly the Monetary Policy Rate (MPR) and Cash Reserve Requirement (CRR) significantly influence Return on Assets (ROA). One major limitation of this study is that the study is limited to deposit money banks listed on the Nigerian Stock Exchange, which may not fully represent the entire banking sector, including non-listed banks and microfinance institutions. As a result, the findings may not be fully generalizable to all financial institutions operating in Nigeria. Another limitation is the focus on selected monetary policy indicators (MPR, CRR, LR, LDR) and government tax revenue as the only measure of taxation. Other policy tools such as open market operations, foreign exchange interventions, and specific tax policies (e.g., VAT, CIT, PIT) were not included, which may also influence bank performance.

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