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MONETARY POLICY AND RETURN ON ASSETS OF DEPOSIT MONEY BANKS IN NIGERIA

IHEJIRIKA, PETERS.O
Department of Banking & Finance, Imo State University, Owerri

G. I. ANYANWU
Department of Banking & Finance, Imo State University, Owerri

&

KENNETH IKENNA MADU
Department of Banking & Finance, Imo State University, Owerri

ABSTRACT

This study examined the effects of monetary policy on the return on asset of Deposit Money Banks in Nigeria for a period of 34 years (1990 – 2023). Cash reserve ratio, liquidity ratio, monetary policy rate and broad money supply (M2) were the monetary policy tools considered as the study adopted the quasi-experimental research design. Secondary time series data were used for the study and these data were sourced from the World Bank (World Development Indicators) and Central Bank of Nigeria (CBN) statistical bulletin for 2023. The major tool of analysis was the Autoregressive Distributed Lag (ARDL) technique that covers short run analysis, bounds test and ECM estimation. Short run analysis revealed that cash reserve ratio has negative but significant effect on the ROA banks while liquidity ratio and broad money supply have negative insignificant effects on ROA of banks. It was revealed that monetary policy rate has positive insignificant effects on return on asset of banks. However, the study showed that there is a long run relationship between the variables; and in the long run, broad money supply has positive insignificant influence on the ROA of banks while cash reserve ratio, liquidity ratio and monetary policy rate have negative insignificant effects on the return on asset of Deposit Money Banks. Hence, the study concluded that monetary policy has an insignificant effect on the return on assets of Deposit Money Banks in Nigeria. The study suggested that policy makers should consider reducing the current cash reserve ratio in order to increase DMBs' loanable funds and improve profitability; it is imperative for the regulatory authority in the Nigerian banking industry to strictly monitor DMBs' liquidity levels in a bid to ensure that they maintain a healthy balance between liquidity and profitability; the Central Bank of Nigeria should further consider using monetary policy rate as a tool to boost the profitability of DMBs in Nigeria though there is need for a careful consideration in this regard; and the apex bank should put up better plans to curtail the volume of money supply outside the banking system in order to make monetary policy drives achieve better results.

KEYWORDS: Monetary Policy, Return on Assets, Deposit Money Banks, Nigeria

Introduction

Nigeria as a typical developing country is saddled with so many structural imbalances. These imbalances reflect in the wide gyration of prices at different times. The economy of the country is so fragile that shocks from developed countries significantly affect what happens in Nigeria. A case in point was the housing sector related meltdown that started in the United States in 2007 that adversely affected the performance of the Nigerian capital market (Schrank, 2024). Nevertheless, the Nigerian government has relied on fiscal, monetary and other direct control measures in regulating and stabilizing the economy the much they can. According to Schrank (2024), monetary policy is a major economic stabilization weapon which involves measures designed to regulate and control the volume, cost, availability and direction of money and credit in an economy to achieve specified macroeconomic policy objectives. Thus, monetary policy is a deliberate effort by the monetary authority (the central bank of a nation) to control the money supply and credit conditions for the purpose of achieving certain broad macroeconomic objectives.

In Nigeria, so many measures of monetary policy have been adopted since the establishment of the Central Bank of Nigeria (CBN) (Ojima & Ajudua, 2024). These measures or instruments of monetary policy are generally tools available to the CBN which they can use to influence the supply of money in the Nigerian economy. According to Bassey and Ekong (2019), these measures include: moral suasion, discount and interest rate policy, open market operations, legal reserve requirements (cash reserve ratio and liquid asset ratio), special deposits, aggregate credit ceiling, credit discrimination in favour of indigenes, selective credit control, and control of non-bank financial institutions. However, it must be stated that moral suasion, discount and interest rate policy, open market operations, legal reserve requirements and special deposits are aimed at reducing the volume of bank credit available to an economy; while aggregate credit ceiling, credit discrimination in favour of indigenes, selective credit control and control of non-bank financial institutions are aimed at influencing the direction of the available credit according to the stated priorities of the economy (Ibeabuchi, 2017).

Monetary policy rate, cash reserve ratio and liquidity ratio are indirect tools that the monetary authority uses through Deposit Money Banks to control the money supply of a country. Given that the use of these tools requires manipulating the credit creation ability of banks, it invariably affects their profit level. Put differently, efforts by the monetary authority to increase any of liquidity ratio or cash reserve ratio will likely reduce the loanable funds of banks which will reduce the assets of banks and adversely affect the profitability of these banks. This is mainly possible given that loans and advances constitute the major asset of Deposit Money Banks. Anything that affects the profitability of banks will directly affect their returns inform of return on equity, return on assets and other profitability measures.

Return on asset (ROA) is a traditional measure of the financial performance of a bank that shows the capital intensity of the bank. It is an indicator that shows the profitability of a bank in terms of its total assets. That is, it shows the ability of the management of a bank to acquire deposits at a reasonable cost and invest them in profitable investments (Ahmed, 2019). Thus, ROA provides information on how efficiently a bank is being run since it indicates how much net income is generated per naira of assets. The higher the ROA, the more profitable the

bank is and vice versa. Accordingly, the monetary policy direction of a country should affect the performance of Deposit Money Banks in the country.

Accordingly, monetary policy has remained a major stabilization tool over the years. It is used in under-developed, developing and developed economies. Monetary policy as a stabilization weapon is used to curtail the excesses of deposit money banks from time to time. The finance literature is awash with empirical studies on monetary policy and bank performance in Nigeria and beyond. In essence, there is a long time debate on the effectiveness of monetary policy as a stabilization tool on the performance of deposit money banks (DMBs). These studies at different times have adopted different methodologies and variables to proxy the performance of banks like return on equity, return on assets, net interest margin, total assets, net income, loans to deposit ratio etc. The studies however, have produced contradicting results with respect to the effect of monetary policy on the performance of Deposit Money Banks. For instance, the likes of Adekunle, Oke and Fasusi, (2024); Uruakpa, (2023); and Mosharrafa and Islam (2021) asserted that monetary policy has a significant effect on bank performance. Researchers like Afolabi and Akinde (2023) and Ajayi and Atanda (2022) countered that notion by reporting that the effect of monetary policy on bank performance is not significant. Another group of scholars strongly believe that monetary policy exerts a positive influence on the financial performance of DMBs (Ojima, 2024; Nwachukwu & Umebali, 2023; Tingvall & Haback, (2021). However, another group of scholars are at the other end of the spectrum (Mokuolu, 2024; Kocha, 2023).

Hence, the researchers were motivated to join the debate but with emphasis on return on assets as a performance indicator of deposit money banks (DMBs). The emphasis was to answer the question: what is the actual effect of monetary policy on the return on assets of DMBs in Nigeria?

Review of Related Literature

Conceptual Review

2.1.1 Cash Reserve Ratio

Cash reserve ratio is a major monetary policy tool that has been used by countries for decades. It is referred to as a primary reserve that is used by monetary authorities for the purposes of liquidity management and prudential regulation. This monetary policy instrument aims at ensuring a high level of liquidity in banks. It represents the minimum amount of cash deposits banks are maintain with the central bank. The ratio expresses the relationship between cash deposits to the total deposit liabilities, certificates of deposits, and promissory notes held by the non-bank public. Thus, Udeh (2015) defines cash reserve ratio as the percentage or proportion of total deposit liabilities (demand, savings and time deposits) which deposit money banks and other financial institutions are required to keep with central bank in order to prevent shortage of cash in meeting the demand for cash by depositors. A change in the required ratio changes the ratio by which the banking system will expand deposit through the multiplier effect. Ojima and Ajudua (2024) stated that CRR may have an impact on DMBs profitability. This is because central bank pays zero interest on the amount commercial banks keeps with them as cash reserve. Deposit money banks earn their proceeds through lending of available funds at higher rates and paying lower rates of interest on deposits amount. An increase in CRR results

in smaller amount of funds at the disposal of DMBs, increase in interest rate, decrease in liquidity and profitability in the system and vice versa.

Liquidity Ratio

Unlike cash reserve ratio, liquidity ratio is regarded as secondary reserve that compliments the primary reserve. However, both cash reserve ratio and liquidity ratio as seen as mandatory reserve requirements which Deposit Money Banks are expected to maintain with the monetary authority at all times. Olweny and Chiluwe (2022) defined liquidity ratio as the proportion of total deposits to be kept in specified liquid assets mainly to safeguard the ability of the banks to meet depositors' cash withdrawals and ensure confidence in the banking system. Liquidity ratio is used to increase or decrease cash availability of banks, however, researchers have argued that the major use of the statutory liquidity ratio of banks is to float government securities, it therefore intends to direct bank credit towards the public sector (Otalu, 2014).

In sum, the central bank also imposes upon DMBs a minimum liquidity ratio, being varied according to the needs of the economic situation at hand. It is designed as such to enhance the ability of banks to meet cash withdrawals on them by their customers. According to Olaoye and Olaniyan (2022), such liquid ratio stands for the proportion of specified 'liquid' assets (such as cash, bills, and government securities) in the total assets of a bank. Thus, the central bank complements the use of OMO with liquidity ratio as one of the reserve requirements. Thus, liquidity ratio is an instrument for liquidity management and for prudential regulation. It refers to the proportion of banks' liquid assets to their total deposit liabilities. Any increase in this ratio, the ability of deposit money banks to create credits declines due to high liquidity requirement. However, with a decrease in liquidity ratio by the monetary authority, deposit money banks will be able to expand their credit and make more profits (Nnanna, 2021).

Monetary Policy Rate

Monetary policy rate is the mother of all interest rates. It is sometimes referred to as rediscount rate or bank rate. Thus, it is the rate at which the central bank of a country rediscount bills of exchange presented by deposit money banks (Alalade, Oseni & Adekunle, 2020). This means that monetary policy rate is a standard rate at which the apex bank is prepared to buy or rediscount bills of exchange or other commercial papers eligible for purchase. This rate is also seen as a short term anchor rate designed to influence other money market rates. It is usually fixed to promote policy efficiency. In Nigeria, the monetary policy rate (MPR) is set by the Monetary Policy Committee (MPC) to guide the short term rates and correct any imbalances that arise from monetary under or over supply to the overall economy (CBN, 2023). This makes MPR to be referred to as the minimum rate at which the Central Bank stands ready to advance loans or discount bills to the banking system. Central banks only rediscount approved bills and first class bills of exchange. In the words of Nnanna (2021), what happens with discount rate is that when DMBs are faced with a shortage of cash reserves, they approach the central bank to get their bills of exchange rediscounted. It is a common method of borrowing by DMBs from the apex bank. The central bank rediscounts the bills presented by the banks because it is a part of its function – lender of last resort. For rediscounting the bill of exchange, the central bank charges a rate and this rate is called bank rate.

Money Supply

The efficacy of monetary policy is the extent to which it can control the money supply of a country. This is because the supply of money has a direct effect on inflation rate and interest rate (Otalu, 2014). So to achieve price stability, monetary authorities through monetary policy try to control money supply. Accordingly, a nation's money supply is determined by the monetary policy actions taken by its central bank. Thus, money supply denotes the total value of money in an economy and it comprises of currency (notes and coins) and deposits with commercial banks (Deposit Money Banks) (Otalu, 2014). There are basically two types of money supply in Nigeria; namely narrow money M1 and broad money M2. M1 measure of money supply comprises currency outside banks and demand deposits (current accounts) at the banks and the Central Bank of Nigeria (CBN), while M2 includes M1, savings, time and foreign currency deposits (Yahaya, & Lamidi, 2015). The component of savings, time and external currency deposits are also called quasi-money. M2 measure of money supply comprises of the total liquidity in the economy. When the levels of money supply by the Central Bank of Nigeria (CBN) changes, it changes through the control of the base money. The Base money includes currency and coins outside the banking system and the deposits of Deposit Money Banks (DMBs) held by the central bank. If the central bank observes that prices are rising and there is too much money in circulation, it may reduce the base money by decreasing money supply. To reduce the base money, the CBN sells financial securities to banks and the non-bank public so as to reduce the money creation ability of Deposit Money Banks (DMBs) and vice versa (Ibeabuchi, 2017).

Return on Asset (ROA)

Return on asset is one of the traditional measures of financial performance and it shows the capital intensity of a bank. It is a financial ratio that indicates how profitable a bank is in relation to its total assets. According to Ene, Atong and Ene (2015), return on assets is a profitability ratio that expresses the relationship between net income and total assets This profitability ratio measures the ability of management to acquire deposits at a reasonable cost and invest them in profitable ventures (Ahmed, 2019). Mosharrafa and Islam (2021) averred that corporate management, analysts, and investors can use ROA to determine how efficiently a company uses its assets to generate a profit. Thus, as a financial ratio, return on asset provides information on how efficient a bank is being run because it indicates how much net income is generated per naira of assets. The higher the ROA, the more profitable the bank is. In other words, a higher ROA means a bank is more efficient and productive at managing its balance sheet to generate profits while a lower ROA indicates there is room for improvement. In addition, this ratio is best used when comparing similar banks or comparing a bank to its previous performance. As such, ROA takes into account a bank's debt, unlike other metrics, such as return on equity.

The metric is commonly expressed as a percentage by using a bank's net income and its average assets. As such, for calculation of return on assets, financial information on net income and total assets of banks are necessary. ROA is basically given as the ratio of net income to total assets.

Theoretical Review

2.2.1 The Monetarist Theory

This theory is championed by Friedman (1963). This theory is a fall-out from the countless criticism of the classical theory. According to the monetarist, only money matters; as they rejected the idea of using fiscal policy for stabilizing an economy instead of monetary policy which is faster and less expensive (Dwivedi, 2008). In Friedman's restatement of the quantity theory of money, the supply of money is independent of the demand for money. The supply of money is unstable due to the actions of monetary authorities. On the other hand, the demand for money is stable. It means that money which people want to hold in cash or bank deposits is related in a fixed way to their permanent income. He maintained that if the central bank increases the supply of money by purchasing securities, people who sell securities will find out that their holdings of money have increased in relation to their permanent income. They will, therefore, spend their excess holdings of money partly on assets and partly on consumer goods and services. This spending will reduce their money balances and at the same time raise the nominal income (Yahaya & Lamidi, 2015).

On the contrary, a reduction in the money supply by selling securities on the part of the central bank will reduce the holdings of money of the buyers of securities in relation to their permanent income. They will, therefore, raise their money holdings partly by selling their assets and partly by reducing their consumption expenditure on goods and services. This will tend to reduce nominal income. Thus, on both counts, the demand for money remains stable. Friedman insisted that a change in the supply of money causes a proportionate change in the price level or income or in both. Given the demand for money, it is possible to predict the effects of changes in the supply of money on total expenditure and income (Yahaya & Lamidi, 2015). Therefore, if the economy is operating at less than full employment level, an increase in the supply of money will raise output and employment with a rise in total expenditure. But this is only possible in the short run. Friedman submitted that monetary policy is more potent and useful than fiscal policy in stabilizing the economy.

Liquid Asset Theory

Dating back to the days of the goldsmith's banking and precious metal coinage, the liquid assets theory argues that banks must hold large amount of liquid assets as reserves against possible demand for payment, the original intent being to keep sufficient gold in safe to redeem any notes presented for payment (Yahaya & Lamidi, 2015). With an abiding home truth for banks, even in modern times, emphasizing the need for holding short term assets as a prudent cushion in the face of uncertainty, the theory is defective in at least two important respects. According to Jide (2017), there is first, the problem of determining accurately the quantity of notes that might be presented at any one time. More significantly, by focusing on the asset side of the balance sheet, the theory is grossly deficient in a world of active money markets and purchased funding where the flow of funds can shift with considerable speed, and banks are increasingly dependent on the markets.

Commercial Loan Theory

This theory is also known as 'real bills doctrine' and it states that bank funds should principally be invested in short term self-liquidating loans for working capital purposes confined to financing the movement of goods through the successive stages of the production circle – production, transportation, storage, distribution and consumption. Excluding loans for long

term purposes (financing plant, equipment, real estate etc.) as inappropriate, the real bills doctrine was predicated on the traditional commercial banking theory, which postulates that as bank deposits are demand or near-demand liabilities, they are best committed to obligations that are self-liquidating over a short period of time in the normal course of business (Yahaya & Lamidi, 2015). However, some economist have challenged this theory on the ground that it is inconsistent with economic and financial realities, as banks today venture into long term banking and other businesses outside core banking in order to stand competition effectively and remain relevant with the changing times. In addition, the theory ignores the fact that the needs of trade are measured in nominal terms that rise in step with prices.

Theoretical Framework

The adopted theory for this theory is the monetarist theory put forward by Milton Friedman in 1963. The suitability of this theory stems from its association with money supply, velocity of money, inflation expectations and interest rates which relates to monetary policy and the performance of Deposit Money Banks. Thus, given that monetary policy adjustments is geared towards controlling the volume of money in circulation and the banking system, an increase in broad money supply can lead to increased lending which will ultimately boost the profit of banks and by extension their return on assets and vice versa. Also, changes in the velocity of money can impact the demand for loans and deposits, which affects the profitability of banks and their returns. In the same vein, changes in inflation expectations and interest rates affect the returns of banks.

Empirical Review

Adekunle, Oke and Fasusi (2024) examined the relationship between monetary policy rates and financial performance of listed deposit money banks (DMBs) in Nigeria between 2013 and 2022. The study used the five largest banks in the country - FUGAZ – i.e. First Bank, United Bank for Africa, Guaranty Trust Bank, Access Bank and Zenith Bank. The study measured bank financial performance using net income and loan to deposit ratio, while the monetary policy variables considered were interest rate, inflation rate, cash reserve ratio, exchange rate and liquidity ratio. The results therefore revealed that while cash reserve ratio has a positive effect on net income, all other variables have insignificant effects on net income. On the other hand, while interest rate has a positive effect on loan to deposit ratio, liquidity ratio has a positive effect on loan to deposit ratio while other variables have no significant effect on loan to deposit ratio.

Oyakhiromhe and Ezu (2024) examined the effect of monetary policy rate on the performance of selected quoted deposit money banks in Nigeria. Adopting a simple regression approach, they regressed return on assets, return on equity and net interest margin on monetary policy rate. Relying on data from Central Bank of Nigeria (CBN) statistical bulletin and the Nigerian Bureau of Statistics (NBS), the study revealed that monetary policy rate has a significant effect on the return on assets of quoted deposit money banks in Nigeria while the effect of monetary policy rate ROE is both significant and positive. However, monetary policy rate also has a significant influence on net profit margin of quoted deposit money banks in Nigeria.

Uruakpa (2023) examined the impact of monetary policy on deposit money banks' profitability in Nigeria between 1985 and 2021. The study employed Ordinary Least Square (OLS) multiple regression, Johansen co-integration and Error Correction Model (ECM) techniques for data analysis and findings revealed that there is a positive insignificant relationship between cash reserve ratio and return on assets of deposit money banks; liquidity ratio has a positive but insignificant impact on return on assets of deposit money banks; there is a positive insignificant relationship between monetary policy rate and return on assets of deposit money banks; and there is a negative but insignificant relationship between money supply and return on asset of these banks in Nigeria.

Asobari and John (2023) investigated the effect of monetary policy on the performance of deposit money banks (DMBs) in Nigeria for the period of 1990 to 2021. Liquidity ratio, cash reserve ratio, prime lending rate, and exchange rate were used to proxy monetary banks' return on assets to gross domestic product (ROA/GDP) was used to capture bank performance. OLS multiple regression technique was used for data analysis and results showed that cash reserve ratio has a positive and insignificant relationship with the ratio of banks' ROA/GDP. Exchange has a negative and significant relationship with the ratio of banks' ROA/GDP. Also, while prime lending rate was found to have a positive and insignificant relationship with ratio of banks' ROA/GDP, liquidity was observed to have a negative and significant relationship with the ratio of banks' ROA/GDP.

Olaoye and Olaniyan (2022) examined the impact of monetary policy on the financial performance of listed deposit money bank in Nigeria using a population of thirty-three (33) deposit money banks listed on the Nigeria Stock Exchange, while only five (5) were sampled. Data collected were analyzed using descriptive, granger causality and Ordinary Least Square (OLS) regression analysis; and results revealed that cash reserve ratio has a significant effect on return on asset; actual lending rate has a significant effect on return on asset; and exchange rate has a significant effect on return on asset of listed deposit money bank. They concluded that there exists strong, positive and significant relationship between exchange rate, cash reserved and actual lending rate in Nigeria.

Lawal, Oyetunji, Adekoya, Aduekpe and Lawal (2022) looked at how monetary policies has affected the performance of Nigeria's listed deposit money banks over time, i.e. 2012 - 2021. Emphases were on open market operations, cash reserve requirements, liquidity ratios and interest rates for monetary policy as return on assets served as a performance metric. Using multiple linear regression and Pearson product correlation analysis, findings showed that open market operations have no significant positive effect on the profitability of Nigeria's listed deposit money banks. Further findings revealed that cash reserve ratios have a significant positive effect on the profitability of Nigeria's listed deposit money banks. Thus, the study averred that monetary policies have a significant influence on the profitability of Nigerian listed deposit money banks when they are pooled together.

Hassan and Oyedele (2022) examined the effect of monetary policy on the financial performance of deposit money banks quoted on the floor of the Nigeria Stock Exchange (NSE) between 2008 and 2020. Monetary policy was represented by cash reserve ratio, inflation rate and interest rate; while financial performance was measured with return on asset (ROA). Using panel data pooled Ordinary Least Square (POLS) multiple regression technique was employed

for data analysis and results showed that cash reserve ratio has a positive significant effect on ROA of Nigerian banks; inflation rate has an insignificant negative effect on ROA of these banks; while, interest rate has a significant negative effect on the return on asset of the samples banks. The study as such concluded that monetary policy is a strong determinant of financial performance of Nigerian banks.

Mosharrafa and Islam (2021) examined the drivers of commercial banks' profitability in Bangladesh using panel data analysis approach. They discovered that banks' liquidity situation has negatively and significantly impacted the return on assets of commercial banks in Bangladesh. Accordingly, the study stated that the trade-off idea of profitability and liquidity is supported by this result. Thus, the study came to the conclusion that effective cost management, enough liquidity, and the issuance of adequate loans can increase the profitability of commercial banks in Bangladeshi.

Okwudili (2021) investigated the impact of monetary policy on financial performance of twelve listed deposit money banks (DMBs) in Nigeria over a period of ten-year (i.e. 2011 to 2020). Loan to asset ratio, loan to deposit ratio, and Central Bank of Nigeria lending rate were used as proxies for monetary policy; while return on asset (ROA) was used as a proxy to measure the financial performance of these banks. For data analysis, panel regression model, Pearson correlation, and descriptive statistics were used. Accordingly, the study stated that loan to deposit ratio significantly improves the financial performance of listed DMBs in NigeriaThe outcome of the study also showed that loan to asset ratio significantly and adversely affects the financial performance of DMBs listed in Nigeria. Finally, the study revealed that CBN lending rate has an insignificant adverse impact on the financial performance of listed DMBs.

Osho and Adelalu (2020) examined the nexus between monetary policy and financial performance of deposit money banks in Nigeria over a period of 15 years (2005 - 2019). Multiple regression tools were used to estimate the joint and individual effects of monetary policy variables (exchange rate, monetary policy rate and maximum bank lending rate) on return on assets of deposit money banks. The study revealed that exchange rate, monetary policy rate and maximum bank lending rate were significantly affected by return on assets. The study as such concluded that monetary policy instruments have been effective for deposit money banks by inducing higher savings, increasing credit supply, stimulating investment which helps these banks to generate higher levels of profitability.

Gap in Literature

Given the studies reviewed, it was observed that many of them concentrated on short-term effects of different monetary policy instruments on return on asset of Deposit Money Banks in Nigeria and outside Nigeria (Oyakhiromhe & Ezu, 2024; Asobari & John, 2023; Olaoye & Olaniyan, 2022; Mosharrafa & Islam, 2021); neglecting the long term implications of monetary policy decisions on ROA. Finally, given that monetary policy direction and directives are ever-changing in this part of the world, it follows that between the times the last of such studies were executed in Nigeria and today, so many things must have transpired. This underlines the currency of this work.

Data And Methods

The quasi-experimental research design was adopted in this study. This is because of the need to establish the cause-effect relationship between monetary policy and return on asset of deposit money banks in Nigeria.

This study used only secondary data. These data were on return on assets, cash reserve ratio, liquidity ratio, monetary policy rate and broad money supply. Yearly time series data on return on asset were collected from the World Bank (online data, 2024) while those on cash reserve ratio, liquidity ratio, monetary policy rate and broad money supply were sourced from Central Bank of Nigeria (CBN) statistical bulletin (2024). However, the following tools were employed for data analysis:

Descriptive Analysis

This analysis was used to describe the data collected for the study. Emphases here were on the mean, median, standard deviation, maximum value, minimum value, kurtosis, and skewness of the variables.

Stationarity/Unit Root Test

This test was performed on the generated time series data using Augmented Dickey Fuller (ADF) test criterion. Given that times series data tend to have stationarity problem, it was necessary to carry out this test. Thus, this test was conducted in order to determine the most suitable analytical tool for the study in order to avoid having misleading (spurious) results.

ARDL Estimation

The ARDL (Autoregressive Distributed Lag) model, which is often used to analyse dynamic relationships with time series data in a single-equation framework, was chosen for this work. This is because of its numerous benefits over other techniques. According to Pesaran, Shin and Smith (2001), these advantages are efficiency in small samples analysis, a combination of linear variables with diverse orders of integration of I(0) and I(1), and the fact that it is less prone to autocorrelation. This as such helped the researcher to obtain short and long run estimates of the model.

Co-integration Test

Bounds test approach to co-integration was adopted to examine if long run relationship exists among the underlying variables. In this procedure, the null hypothesis of no co-integration was tested against the alternative hypothesis of co-integration with the application of F-test.

Model Specification

$$ROA = F(CRR, LQR, MPR, MSS) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \; (3.1)$$

$$ROA = \beta_0 + \beta_1 CRR + \beta_2 LQR + \beta_3 MPR + \beta_4 MSS + e \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \; (3.2)$$

$$ROA_t = \beta_0 + \beta_1 ROA_{t-1} + \beta_2 CRR_t + \beta_3 LQR_t + \beta_4 MPR_t + \beta_5 MSS_t + ECM \quad \ldots\ldots\ldots\ldots (3.3)$$

Where:

ROA	=	Return on Asset
CRR	=	Cash Reserve Ratio
LQR	=	Liquidity Ratio
MPR	=	Monetary Policy Rate
MSS	=	Broad Money Supply
ECM	=	Error Correction Variable

β_0 = Constant term
β_i = Slopes of the model
e = Stochastic error term

Data Analysis and Interpretation Of Results

4.1 Descriptive Analysis

Descriptive Statistics	ROA	CRR	LQR	MPR	MSS
Mean	1.028529	12.11118	49.61029	13.88971	13087.73
Median	1.740000	9.750000	47.65000	13.50000	4462.655
Maximum	3.800000	32.50000	104.2000	26.00000	63512.40
Minimum	-23.26000	1.000000	26.39000	6.000000	47.42000
Std. Dev.	4.364711	8.886715	15.22638	3.849533	16433.14
Skewness	-5.274747	0.746163	1.451541	0.653449	1.343757
Kurtosis	29.95111	2.336792	6.393818	4.739458	4.112011
Jarque-Bera	1186.677	3.778080	28.25666	6.706071	11.98401
Probability	0.000000	0.151217	0.000001	0.034978	0.002499
Sum	34.97000	411.7800	1686.750	472.2500	444983.0
Sum Sq. Dev.	628.6732	2606.132	7650.810	489.0239	8.91E+09
Observations	**34**	**34**	**34**	**34**	**34**

Source: E-Views 10 Output (2025)

In addition to the mean, median, maximum and minimum values, and standard deviation of the variables considered, the table above equally houses the skewness and kurtosis of the variables. Accordingly, the table shows that the variable ROA is negatively skewed (skewed to the left) with a negative value of -5.274747 while the other variables, CRR, LQR, MPR and MSS are positively skewed with positive values of 0.746163, 1.451541, 0.653449 and 1.343757 respectively. Subsequently, the curves of the variables ROA, LQR, MPR and MSS are positively peaked at leptokurtic level with kurtosis values that are greater than three (29.95111, 6.393818, 4.739458 and 4.112011 respectively); while the variable CRR is negatively peaked at platykurtic level with a kurtosis value of 2.336792, which is less than three. As such, only the variable CRR is normally distributed as it has a Jarque-Bera probability value that is greater than 5% (0.05).

Unit Root Test

Variables	ADF Test Statistic	ADF critical Value @ 5%	Probability Value	Level of Integration	Remark
Log_ROA	-5.427685	-2.960411	0.0001	I(0)	Stationary
Log_CRR	-5.043603	-2.957110	0.0003	I(1)	Stationary
Log_LQR	-6.414987	-2.957110	0.0000	I(1)	Stationary
Log_MPR	-6.819191	-2.957110	0.0000	I(1)	Stationary
Log_MSS	-4.131554	-2.954021	0.0029	I(0)	Stationary

Source: Extract from E-Views 10 Output (2025)

Unit root test result showed that the variables are stationary at different levels of integration. The variables ROA and MSS are stationary at level with probability values of 0.0001 and 0.0029 respectively that are less than 0.05 (5%) level of significance at no point of

differencing. Similarly, the variables CRR, LQR and MPR are stationary at first difference with probability values of 0.0003, 0.0000 and 0.0000 respectively that are also greater than 0.05 (5%) level of significance at first difference. This suggests a mixed order of integration and calls for the adoption of Autoregressive Distributed Lag (ARDL) analytical technique.

ARDL Short Run Analysis

Variables	Coefficients	Std. Error	t-Statistic	P-Value
ROA(-1)	-0.421050	0.282236	-1.491839	0.1666
Log_CRR	-1.930319	0.551883	-3.497696	0.0057
Log_LQR	-1.087043	0.666594	-1.630741	0.1340
Log_MPR	1.510341	1.024772	1.473831	0.1713
Log_MSS	-2.577300	1.471313	-1.751700	0.1104
Constant	6.189600	5.161272	1.199239	0.2581

Source: Extract from E-Views 10 Output (2025)

Short run analysis revealed that the variables lagged ROA (-1), cash reserve ratio, liquidity ratio and broad money supply have negative effects on current period return on assets. This is because the regression coefficients of these variables are: -0.421050, -1.930319, -1.087043 and -2.577300 respectively. In essence, a unit rise in any of these variables will generate a decrease in the ROA DMBs in Nigeria to the tune of about 42.11%, 193.03%, 108.70% and 257.73% respectively. Conversely, a unit decrease in any of the variables (ROA (-1), CRR, LQR and MSS) will generate an increase in the ROA of DMBs in Nigeria to the tune of about 42.11%, 193.03%, 108.70% and 257.73% respectively. However, monetary policy rate has a positive effect on the return on asset of banks in the country with regression coefficient of 1.510341. Thus, a percentage increase in monetary policy rate leads to about 151.03% increase in the ROA of DMBs in Nigeria and vice versa.

Bounds Test

Test Statistic	Value	Level of significance				
F-statistic	5.696243	**Bounds**	**1%**	**2.5%**	**5%**	**10%**
Degrees of Freedom	4	Lower I(0)	3.29	2.88	2.56	2.2
		Upper I(1)	4.37	3.87	3.49	3.09

Source: Extract from E-Views 10 Output (2025)

Bounds cointegration test revealed that there is cointegration between the variables. Put differently, there is a long run equilibrium relationship between monetary policy and Deposit Money Banks' return on equity in Nigeria. This is so because the value of F-statistic (5.696243) exceeds the 5% upper bound value of 3.49.

ARDL Long Run Analysis

Variables	Coefficients	Std. Error	t-Statistic	P-Value
Log_CRR	-0.613703	0.416391	-1.473861	0.1713
Log_LQR	-0.314567	0.807723	-0.389449	0.7051
Log_MPR	-0.036796	1.195514	-0.030778	0.9761
Log_MSS	0.004292	0.126321	0.033977	0.9736
Constant	4.355652	3.950449	1.102571	0.2960

Source: Extract from E-Views 10 Output (2025)

The above table contains a summary of long run ARDL results obtained. Specifically, it shows that broad money supply has a positive effect on return on asset (ROA) of Deposit Money Banks while cash reserve ratio, liquidity ratio and monetary policy rate have negative effects on Deposit Money Banks' return on asset (ROA) in Nigeria. The table subsequently showed that in the long run, none of the explanatory variables (cash reserve ratio, liquidity ratio, monetary policy rate and broad money supply) was statistically significant at 5% level of significance. Finally, the table revealed that in the long run, the intercept or constant term of the model is 4.355652, which implies that holding these explanatory variables constant, ROA of Nigerian banks will stand at 435.56% per annum.

ECM Estimation

Variables	Coefficients	Std. Error	t-Statistic	P-Value
D(LOG-CRR)	-1.930319	0.233649	-8.261601	0.0000
D(LOG-LQR)	-1.087043	0.312409	-3.479547	0.0059
D(LOG-MPR)	1.510341	0.423518	3.566182	0.0051
D(LOG-MSS)	-2.577300	0.799491	-3.223676	0.0091
ECM	-0.421050	0.198470	-7.160041	0.0000

Source: Extract from E-Views 10 Output (2025)

From the above table, the coefficient of the cointegrating equation is -0.421050 with a probability value of 0.0000. These desired outcomes and conditions of ECM that states that the coefficient of the cointegration equation (ECM) has to have a negative sign and the probability value of the cointegrating equation should be less than 0.05 (5%) level of significance. The implication of this is that in an event of any distortion to the established equilibrium relationship between the variable, the propensity of monetary policy re-establishing equilibrium is about 42.11% per annum.

4.7 Diagnostic Tests

Test	Criterion	F-Statistic	P-value
Normality	Jarque-Bera	3.772649	0.151628
Autocorrelation	Q-Statistic	-	> 0.05
Heteroscedasticity	Breusch-Pagan-Godfrey	0.626543	0.8174
CUSUM	Cumulative Sum Plot	-	Within range
Multicollinearity	Variance Inflation Factors	< 5	-
Serial Correlation	Breusch-Godfrey LM Test	0.354858	0.7063

Source: Extract from E-Views 10 Output (2025)

From the above table, it can be deduced that the errors of the model are normally distributed; there is no presence of auto correlation in the model; the errors of the model are homoscedastic whereby the variances of the errors are constant; and the model's parameters were stable over the sample period.

Discussion of Findings

The major findings of this study are in four folds. First, the study showed that cash reserve ratio has a negative but significant effect on the return on asset (ROA) of deposit money banks in Nigeria. The first part of this result implies that an increase in the mandatory cash reserve DMBs are expected to deposit with the Central Bank of Nigeria, will lead to a decrease in the ROA of these banks. This was expected because an increase in cash reserve ratio will reduce the loan portfolio of banks and this will adversely affect the returns these banks get from extending credit to customers (Asobari & John, 2023; Nnanna, 2021).

Next, the study revealed that liquidity ratio has a negative insignificant influence on deposit money banks return on asset in Nigeria. This meets the study's expectation that the relationship between liquidity ratio and ROA will be negative. Thus, in as much as liquidity ratio is secondary reserve, increasing it will adversely affect the lending ability of banks and given that a huge chunk of banks' profit comes from lending, their returns will dwindle (Ojima & Ajudua, 2024; Ahmed, 2019). Nevertheless, the outcome of this result was insignificant may be because CBN's liquidity ratio directives does not actually affect the actual reserves of banks as these banks always find a way to maintain excess reserves.

Also, the effect of monetary policy rate on the ROA of Nigerian banks is both positive and insignificant. The expectation here was that return on asset of banks will negatively react to monetary policy rate since an increase in monetary policy rate leads to an increase in lending rate which ordinarily will discourage borrowing by customers and lead to a decline in the return of banks from lending activities. However, the unexpected positive and insignificant association observed between monetary policy rate and ROA of banks may be as a result of monetary policy forecasting problem as the formulation of an appropriate monetary policy requires a reliable assessment of the nature and magnitude of the problem at hand. Hence, given the structural imbalances of Nigerian as a less developing country, having a reliable forecast of macroeconomic variables remains an enigma (Oyakhiromhe & Ezu, 2024; Hassan & Oyedele, 2022).

Finally, broad money supply has a negative undesirable insignificant effect on the ROA of deposit money banks in Nigeria. The study expected broad money supply to have a positive and significant effect on the return on assets of Deposit Money Banks in Nigeria. This is because an increase in currency in circulation and deposits of banks will lead to a boom in economic activities which ordinarily will increase the propensity to borrow and lend on the part of customers and banks respectively. This will end up increasing the returns of banks at the end of the day (Dare & Okeya, 2017; Kocha; 2023; Olweny & Chiluwe, 2022). However, the effect of broad money supply on ROA of banks was insignificant possibly because of the huge volume of monies that reside with Nigerians. Such money do not end up in the coffers of banks and the effectiveness of monetary policy is tied significantly to the volume of money within the banking system.

Conclusion and Recommendations

Conclusion

Basically, this study revealed that only monetary policy rate has a positive effect on Deposit Money Banks' return on assets while only cash reserve ratio has a significant effect on banks' return on asset. Accordingly, the study concluded that monetary policy has an insignificant effect on the return on assets of Deposit Money Banks in Nigeria.

Recommendations

1. There is need to review cash reserve ratio in Nigeria. Policy makers should consider reducing the current cash reserve ratio in order to increase DMBs' loanable funds and improve profitability.
2. It is imperative for the regulatory authority in the Nigerian banking industry to strictly monitor DMBs' liquidity levels in a bid to ensure that they maintain a healthy balance between liquidity and profitability.
3. The Central Bank of Nigeria should further consider using monetary policy rate as a tool to boost the profitability of DMBs in Nigeria. However, there is need for a careful consideration in this regard given the insignificant effect of monetary policy rate on the ROA on DMBs in Nigeria.
4. The apex bank should put up better plans to curtail the volume of money supply outside the banking system in order to make monetary policy drives achieve better results.

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