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

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K E Y W O R D S

Monetary Policy, Return on Equity, Deposit Money Banks, Nigeria

A B S T R A C T

This study investigated the effects of monetary policy on the return on equity (ROE) of Deposit Money Banks (DMBs) in Nigeria between 1990 and 2023. Monetary policy rate, interest rate, liquidity ratio and cash reserve ratio were monetary policy tools considered. Data on the aforementioned variables were sourced from Central Bank of Nigeria statistical bulletin and the World Bank (World Development Indicators). The data were exposed to Augmented Dickey Fuller (ADF) unit root and descriptive analyses. Following unit root tests, Autoregressive Distributed Lag (ARDL) analytical technique was adopted for further analysis. Results revealed that in the short run, one year lagged return on equity has positive insignificant effect on ROE; monetary policy rate has positive and significant influence on ROE; interest rate and cash reserve ratio have inverse but significant effects on ROE while the effect of liquidity ratio is both negative and insignificant. In the long run, monetary policy rate and cash reserve ratio have direct effects on ROE of banks while interest rate and liquidity ratio have inverse effects on banks' ROE in Nigeria. However, only the effects of monetary policy rate and interest rate were statistically significant. The study concluded that monetary policy has a significant effect on the ROE of deposit money banks in Nigeria. Thus, there is need for relevant authorities like the Central Bank of Nigeria to optimize monetary policy rate; policy makers should be cautious when adjusting interest rates, as it may negatively impact banks' profitability; the monetary authority should consider reducing the cash reserve ratio in order to increase DMBs' lendable funds and improve profitability; and it is important for policymakers to monitor banks' liquidity levels in order to ensure they maintain a healthy balance between liquidity and profitability.

Introduction

The world over, the financial system of a country consists basically of bank and non-bank financial institutions. These institutions act as financial intermediaries that facilitate the flow of funds from the surplus end of the country to the deficit end of the country. Bank

financial institutions in Nigeria comprise of Deposit Money Banks (commercial banks), merchant banks, development banks, microfinance banks and the Central Bank of Nigeria at the apex of the regulator of these banks (Adewole & Nnaji, 2018). The non-bank financial institutions consists of special institutions like insurance companies, finance houses, the Nigerian Stock Exchange (NSE), Securities and Exchange Commission (SEC), Primary Mortgage Institutions (PMIs), Pension and Prudent Funds etc. Among these institutions, Deposit Money Banks (DMBs) stand out because they are the only financial intermediaries whose demand deposit circulates as money; they have the sole power to destroy money and the power to create money through the monetization of debt; and they hold the money supply of nations. Thus, when compared to other bank financial institutions, Deposit Money Banks operate differently and their operations are backed by law. In essence, while DMBs offer services to individuals, they are primarily concerned with receiving deposits and lending to businesses at a profit (Olaoluwa & Shomade, 2017).

Deposit Money Banks are also known as commercial banks because all their operations are geared towards maximizing profit for their owners. As major contributors of the capital of a bank, the owners (shareholders) are entitled to returns at the end of every financial year provided the bank makes profit. This return shareholders are entitled to at the end of every business year is referred to as return on equity (ROE). Basically, this is the major interest of shareholders and it is the only thing that gives them confidence that the management of a bank is operating efficiently. It is also an indicator that the management team of a bank is pursuing the interest of shareholders to a reasonable extent. Ojima and Ajudua (2024) stated that periodic payment of dividend is one of the ways of resolving any potential agency problem between management and shareholders of banks. Nevertheless, the returns shareholders are entitled to depend on the profit a bank makes at the end of the business year and the profitability of DMBs is a function of so many factors. One of such factors is the prevailing monetary policy of the apex banks.

Monetary policy is a stabilization weapon that is used to regulate and control the activities of Deposit Money Banks. Monetary policy targets the reserves and deposits of banks, thereby dictating the cost, volume and direction of money in the country. Amongst all corporate entities, DMBs are the most regulated and this is because their stock in trade is cash (money) which lubricates economic activities. Again, a run on a bank is a run on an economy. If the banking system of a country collapses, definitely the economy of that country will collapse (Doyin-Hassan & Ijeoma, 2017). In Nigeria, given this token, the Monetary Policy Committee of the Central Bank of Nigeria (CBN) meets from time to time to evaluate the performance of DMBs and by extension the economy. At the end of every of such meetings, monetary policy tools are adjusted in full or partially based on the direction the economy is headed or the direction they want the economy to head. The popular monetary policy tools in Nigeria are Open Market Operations (OMO), monetary policy rate, cash reserve ratio, liquidity ratio and interest rate but emphasis in this work is on the quantitative tools which excludes Open Market Operation (OMO). In essence, so many monetary policy tools have been adopted in Nigeria since the establishment of the Central Bank of Nigeria (CBN) and the target has always been the money supply of the country which directly or indirectly affects other macroeconomic aggregates like price stability, economic growth, balance of payment, exchange rate etc. (Olweny & Chiluwe, 2022).

Researchers have undertaken countless studies on the possible factors or reasons militating against the desired performance of Deposit Money Banks in Nigeria and beyond. One factor that has been widely researched on is monetary policy as there are series of studies on monetary policies and bank performance down the years (Adekunle, Oke & Fasusi, 2024; Mokuolu, 2024; Nwachukwu & Umebali, 2023; Jeff-Anyeneh, Anachedo, Okonkwo & Udoye, 2023; Alalade, Oseni & Adekunle, 2020). A careful observation shows that some of these studies were carried out in Nigeria while others were done outside the shores of Nigeria. Thus, these studies have been variously structured with respect to variables considered, period covered and analytical tools used for analysis. These have given such studies different directions, objectives and goals. In essence, existing studies on monetary policy and bank performance have produced conflicting results. The likes of Ojima and Ajudua (2024), Nwachukwu and Umebali (2023) and Asobari and John (2023) reported that monetary policy has insignificant effects on bank performance; while scholars like Oyakhiromhe and Ezu (2024), Kocha (2023) and Azeez and Ilori (2021) reported that the effects of monetary policy on bank performance remain significant. However, other researchers like Jeff-Anyeneh, Anachedo, Okonkwo and Udoye (2023), Owoeye, Kajola, Oyetayo and Oshadare (2023), and Akeem, Taiwo, Augustine, Edinaeval and Olawumi (2022) opined that the effects are positive; while a negative effect was suggested by the likes of Afrogha, Tyohen and Afrogha (2023), Clement (2021), and Ejem and Ogbonna (2020). Nevertheless, Ojima and Ajudua (2024), Azeez and Ilori (2021), and Alalade, Oseni and Adekunle (2020) reported long run relationship between monetary policy and the performance of banks.

Accordingly, it is not out of place to conclude that studies on monetary policy and bank performance are exhaustive but one question still remains: what is the actual effect of monetary policy on the performance of Deposit Money banks in Nigeria? This question still resonates because there is no consensus on the effects of monetary policy on the return on equity of banks in Nigeria.

REVIEW OF RELATED LITERATURE

Conceptual Review

Monetary Policy Rate

This rate is otherwise known as discount rate or bank rate. According to Alalade, Oseni and Adekunle (2020), it is the rate at which the central bank of a country rediscount bills of exchange presented by commercial (deposit money) banks. It is as such the standard rate at which the apex bank is prepared to buy or rediscount bills of exchange or other commercial papers eligible for purchase. Monetary policy rate is a short term anchor rate designed to influence other money market rates. It is usually fixed to promote policy efficiency. The 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). Put differently, discount rate refers to the minimum rate at which the Central Bank stands ready to advance loans or discount bills to the banking system. It is also called variable rediscount rate or minimum rediscount rate. Nevertheless, 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.

Interest Rate

Generally, interest rate is referred to as the cost of money. It can further be seen as the cost incurred by the borrower for the use of money they borrowed from a lender or a financial institution (Collins & Wanjau, 2021). Others see it as price for the use of an asset over a period of time, usually monthly, quarterly or annually depending on the period (tenor). In other words, interest rate is the price of credit which might be subject to distortions due to inflation. Ojoh (2019) defined interest rates as the rental payment for the use of credit by borrowers and the return for parting with liquidity by lenders. Like other prices, interest rates perform a rationing function by allocating limited supply of credit among the many competing demands. Thus, interest rate represents a percentage that is usually charged on sum of money that is given to the borrower for the usage of such money with the promise to pay back in future date. In essence, in every transaction that involves borrowing and lending of money, there is always a borrower and a lender. When a lender lends to a borrower, there is an opportunity cost for such. In order to compensate the lender for parting with his money, a given agreed sum is paid to him. This agreed sum is called interest. When this amount is expressed as a percentage of the borrowed sum (principal), it is termed interest rate. Thus, interest rate is the reward for parting with liquidity or money for a specified period of time. It is the amount of money due per period, as a proportion of the amount lent, deposited or borrowed. Rate of interest is also seen as a measure of the unwillingness of those who possess money to part with their liquid control over it. It is as such referred to as the 'price or cost' of borrowing money (Enoh, 2019).

Cash Reserve Ratio

Cash reserve ratio alongside liquidity ratio, are reserve requirements used by central banks for the purposes of liquidity management and prudential regulation. Cash reserve ratio is otherwise known as primary reserve. It is an instrument that aims at ensuring a high level of liquidity in banks. This ratio represents the minimum amount of cash deposits to be maintained by a bank (deposit money bank) 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. According to Udeh (2015), CRR is 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 (Udeh, 2015). Bawa, Akinniyi and Njarendy (2018) defined CRRs as taxes on the return on deposits both foreign and domestic on a bank balance sheet since other resources that have similar risks and returns do not have cash required reserves. In other words, cash reserve ratio refers to the cash reserves or balances held by banks with the central bank and which the central bank has authority to vary according to the exigencies of the credit control. Such deposits with the central bank must not be less than a prescribed

proportion of the banks' deposit liabilities. Cash reserve ratio is one of the most powerful instruments of monetary control that is used to increase or reduce the liquidity of banks. 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

Liquidity ratio is equally known as secondary reserve which ensures that banks are liquid at all times and also ensures that they are able to satisfy the liquidity needs of their customers, sustain the confidence of the public and ensures that the system is sound, safe and healthy. 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 commercial 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 commercial 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).

Return on Equity (ROE)

Return on equity is a major financial performance matrix of Deposit Money Banks. It is considered the most important indicator of a bank's profitability and growth potential. For investors (shareholders), it is on the best performance measures. Return on equity is defined as the rate of return to shareholders or the percentage return on each naira of equity invested in a bank (Eze, 2017). ROE is considered the return on net assets. ROE is seen as a gauge of a bank's profitability and how efficient it is in generating profits. The higher the ROE, the more efficient a bank's management is at generating income and growth from its equity financing. ROE by extension is an internal performance measure of shareholders' value, and it is by far the most popular measure of performance because it proposes a direct assessment of the financial return of shareholder's investment. Abdullahi

(2022) explains that sustainable growth rates and dividend growth rates can be estimated using ROE, assuming that the ratio is roughly in line or just above its peer group average. Although there may be some challenges, ROE can be a good starting place for developing future estimates of a stock's growth rate and the growth rate of its dividends. These two calculations are functions of each other and can be used to make an easier comparison between deposit money banks (Oyakhiromhe & Ezu, 2024).

As a measure of financial performance, return on equity is calculated by dividing net income by shareholders' equity since shareholders' equity is equal to a company's assets minus its debt. Thus, ROE is calculated by taking net income after tax of a given year and dividing it by the book value of equity at the beginning of the year. Equity is consisted of the issued ordinary share capital plus the share premium and reserves (Panigrahi, Zainuddin & Azizan, 2014). ROE is given as net income over shares outstanding in a corporate entity.

Theoretical Review

2.2.1 The Classical Theory

The classical school refers to the tradition of economic thought that originated in Adam Smith and developed through the work of David Ricardo, T.R. Malthus, J.S. Mill, down to A. Marshall and A.C. Pigou (Dwivedi, 2008). The hey days of classical economics was during the years 1800 to 1850; and the classical theory started with the work of Adam Smith (1776), in his book "An Inquiry into the Nature and the Causes of the Wealth of Nations"; where he maintained that if everyone did what was best for them, the result would be best for the society (Onouorah, Shaib, Oyathelemi, & Friday, 2016). The theory assumes that there is a force called "invisible hand" that directs or controls people's action. As such, the theory emphasized the importance of the free-market mechanism and believed that any interference by government, whether in the form of fiscal or monetary policy will distort the market's smooth operations and lead to disequilibrium. The theory advocated for zero government interference (Amacher & UIbrich, 2016; Onouorah, Shaib, Oyathelemi, & Friday, 2016; Dwivedi, 2008).

However, critics argued that the classical theory, to an extent, is an analysis of an ideal situation which does not exist in reality due to their numerous unrealistic assumptions. The biggest critic of the classical theory is John Maynard Keynes who anchored his criticism of the failure of the free market system in addressing the challenges of the great depression of the 1930s (Dwivedi, 2008). With this token, he came up with his own theory called the Keynesian theory.

The Keynesian Theory

Keynes (1936), in his General theory of interest rates, argued that the solution to the great depression, which saw the demolition of whatever faith was left on the self-regulating capitalist system, is a demand side policy. The solution to him is to stimulate the economy through two approaches: government autonomous investment spending on infrastructure and interest rate reduction by the monetary authority (Diamond, 2018). He maintained that the initial stimulation induces further investment with its multiplying effect. He then presented a reformulated quantity theory of money which brought about a transition from a monetary theory of prices to a monetary theory of output. In doing this, Keynes made an

attempt to integrate monetary theory with value theory and also linked the theory of interest into monetary theory. But it is through the theory of output that value theory and monetary theories are brought into juxtaposition with each other (Jhingan, 2010). According to Keynes, the effect of a change in the quantity of money on prices is indirect and non-proportional. Therefore, the chain of causation between changes in the quantity of money and in prices is an indirect one through the rate of interest. Hence, when the quantity of money is increased, its first impact is on the rate of interest which tends to fall. Given the marginal efficiency of capita, a fall in the rate of interest will increase the volume of investment. The increased investment will raise effective demand through the multiplier effect thereby increasing income, output and employment (Adegbola, 2016).

The greatest criticism of the Keynesian theory is the inefficiency and waste associated with the public sector. Critics of the theory believe that if economic activities are solely left in the hands of the government, it will be counterproductive as the volume of waste at the end of the day will cancel out the benefits of government involvement (Yahaya & Lamidi, 2015).

The Agency Theory

Agency theory was developed by Jensen and Meckling (1976) who defined the agency relationship as a form of contract between a company's owners and its managers, where the owners appoint an agent (the managers) to manage the company on their behalf. As a part of this arrangement, the owners must delegate decision-making authority to the management. The owners expect the agents to act in their best interests. Ideally, the 'contract' between the owners and the managers should ensure that the managers always act in the best interests of the shareholders (Barnea, Haugen & Senbet, 2015). However, it is impossible to arrange the 'perfect contract', because decisions by the managers (agents) affect their own personal interests as well as the interests of the owners. Managers will give priority to their personal interests over those of the shareholders of the company and as such, it will affect the overall performance of the company (Chowdhury, 2014).

Jensen and Meckling (1976) suggested that when this happens, there is a weakness or failing on the organization's corporate governance; since the shareholders interest is not the same as the interest of the management and the management manages the organisation on behalf of the shareholders, a conflict known as agency conflict ensures. This conflict is strictly based on differential in interests which arises as a result of moral hazard. It is argued that in order to reduce the agency problem, incentives, such as annual awards, cash bonus, share awards, share options, etc., should be provided to management to increase their willingness to take 'value-maximising decisions' – in other words, to take decisions that benefit the shareholders by maximising the value of their shares which result from improved performance (Obagunwa & Akinwale, 2018).

Theoretical Framework

Given that monetary policy is a recognized stabilization policy measure that recognizes the involvement of the government in addressing macroeconomic problems through Deposit Money Banks, the most suitable theory for this study is the Keynesian theory. Emphasis here is on controlling the deposit creation ability of DMBs using monetary policy tools like monetary policy rate, interest rate, liquidity ratio and cash

reserve ratio. What happen is that if the apex bank wants to reduce the credit creation ability of DMBs, they increase the mother of all rates, the monetary policy rate and vice versa. They can equally do same by pushing either cash reserve ratio or liquidity ratio up. Since the main asset of banks is loans and advances, manipulating their ability to create deposits goes a long way in affecting their financial performance which equally affects the returns shareholders get at the end of the day.

Empirical Review

Studies on monetary policy on the performance of Deposit Money Banks abound but only a few that considered return on equity as a measure of bank performance will suffice. For instance, Mokuolu (2024) studied the effect of monetary policy on the performance of deposit money banks in Nigeria between 2006 and 2021. Monetary policy rate, liquidity rate, lending rate and cash reserve ratio were monetary policy told studied while ROE was adopted as a measure of bank performance. The pooled Ordinary Least Square (OLS) estimation, fixed and random effects were analytical tools employed. Results revealed that the effect of monetary policy rate on return on equity of banks is positive and insignificant; lending rate, liquidity ratio and cash reserve ratio exert negative significant effect on return on equity of banks in Nigeria.

In a major shift from other studies, Oyakhiromhe and Ezu (2024) examined the effect of monetary policy rate on the performance of selected quoted Deposit Money Banks in Nigeria. The focus was only on monetary policy rate as a measure of monetary policy while return on assets (ROA), return on equity (ROE) and net interest margin (NIM) were considered as proxies for bank performance. The Ordinary Least Square (OLS) regression analytical technique was adopted for data analysis. Results showed that monetary policy rate has a significant effect on the ROA and NIM of quoted deposit money banks while monetary policy rate has a significant positive effect on the ROE of quoted deposit money banks in Nigeria.

Denis (2021) investigated the impact of monetary policy on the performance of deposit money banks (DMBs) in Nigeria from 2013 to 2019. Cash reserve ratio, money supply, foreign exchange rate and monetary policy rate were the monetary policy tools investigated vis-à-vis the performance of seventeen (17) DMBs in Nigeria. Data gathered were analyzed using descriptive statistics, correlation analysis, panel pooled regression and random effect analysis. Discoveries from the study demonstrated that monetary policy rate, exchange rate, and cash reserve ratio have negative impacts on the performance of banks in Nigeria. In addition, the moderating variable of bank size showed a weak significant positive impact on performance.

Clement (2021) examined the impact of monetary policy on the performance of deposit money banks (DMBs) in Nigeria for the period 2013 - 2019. Monetary policy rate, exchange rate, money supply (M2), and cash reserve ratio were used as proxies for monetary policy while return on equity (ROE) was used as a proxy for DMBs' performance. Basically, the study made used of panel regression model and the random effect model based on Hausman test conducted. The findings of the analysis revealed that monetary policy rate, exchange rate, and cash reserve ratio have negative impacts on the performance of DMBs in Nigeria; however, only exchange rate was not significant at 5% level of significance while money supply has a significant positive impact on performance.

Omankhanlen, Isibor and Okoye (2020) on their part looked at the relationship between monetary policy and the accomplishment of a bank's profit target for the period 2002 – 2019. The focus was to determine how monetary policy tools like liquidity ratio, interest rate, and money supply (M2) have affected the goal of deposit money banks' which is profit maximization. Data for the study were collected from Central Bank of Nigeria statistical bulletin and the assembled data were analyzed using Auto Regressive Distributed Lag and Error Correction Model related tools. Findings revealed that a positive long-term relationship exists between liquidity ratio and deposit money banks' profitability, as well as a negative long-term relationship between interest rates and deposit money banks' profitability. Subsequently, they observed that a positive long-term relationship subsists between money supply (M2) and deposit money banks' profitability.

Ejem and Ogbonna (2020) examined how banks react to the monetary policies transmission mechanisms of the Central Bank of Nigeria (CBN). The data employed were collected were Enger-Granger two-step cointegration and Indirect Least Square (ILS) regression analysis. The major findings revealed that cash reserve ratio negatively and significantly affects the performance of deposit money banks in Nigeria, while other monetary policy variables exert insignificant effects on the performance of deposit money banks. It was also found that apart from banks own shock; banks respond negatively to shocks from major monetary policy instruments. It was observed that monetary policy rate affects bank performance in both in the short run and long run; while, cash reserve ratio, liquidity ratio and saving deposit rate do not affect bank performance in the short run but in the long run. It was also found that monetary policy instruments jointly influence bank performance in the short and long run as opposed by individual instruments in Nigeria.

Kumar, Acharya and Ho (2020) investigated the relationship between monetary policy and bank profitability in New Zealand using the generalized method of moments (GMM) estimator between 2006 and 2018. Results suggested that an increase in short-term rate leads to an increase in the profitability of banks, while an increase in long-term interest rates reduces bank profitability and are all statistically significant.

Younus and Akhtar (2019) examined the significance of statutory liquidity requirement (SLR) as a monetary policy instrument in Bangladesh. Using descriptive analytical technique, they found that statutory liquidity requirement has experienced infrequent changes and past evidence showed that reduction in statutory liquidity reserve produced positive impact on bank credit and investment especially prior to the 1990s. Statutory liquidity requirement and cash reserve requirement were found to be significant tools of reducing inflation and both are used only in situation of drastic imbalance resulting from major shocks. They thus posited that Bangladesh Bank has used open market operations (OMO) more frequently rather than changes in bank rate and statutory liquidity requirement (SLR) as instruments of monetary policy in line with its market oriented approach.

Okoye and Udeh (2019) examined the impact of monetary policy on corporate profitability in Nigeria's banking sector using regression analysis. The data for the study were secondary data, and the study developed four models that were expected to forecast the future profits of the banks studied. The findings indicated that monetary policy has limited corporate profitability in Nigerian banks.

Odior and Ejedegba (2018) examined how Nigeria's commercial banks' profitability was impacted by CBN's monetary policies. The study was based on annual national aggregate level data for 35 years (1980 – 2014) using multivariate regression analysis as the major analytical tool. Findings demonstrated that monetary policy rate, cash reserve ratio, and exchange rate annually increase bank profitability in the long and short terms, while treasury bill rate and liquidity ratio annually decrease bank profitability in the long and short terms. The study also showed that CBN's monetary policy has similar short and long term effects on banks' profitability.

Adewole and Nnaji (2018) examined the impact of monetary policy on the profitability of deposit money banks in Nigeria for a period of ten years (2008 - 2017). The impacts of monetary policy on the profitability of deposit money banks in Nigeria was experimentally determined using a systematic collection of time series and cross-sectional data that ware pooled into a panel data set for the period studied. For data analysis, Johansen's multivariate co-integration and panel regression were used. The study found that monetary policy, as measured by the cash reserve ratio and monetary policy rate have considerable impacts on the profitability of deposit money banks in Nigeria.

Ampudia and Van den Heuvel (2018) examined the association between monetary policy and bank equity values of selected European banks by adopting a pure qualitative approach that relied mainly on descriptive and content analyses in a time of low interest rates. It was revealed that changes in policy rate have a significant impact on stock prices of European banks. According to the study's findings on monetary policy and bank equity values at a time of low interest rates, a decrease in the policy rate has a positive effect on bank equity values before the global financial crisis. The study also found that banks with a high reliance on deposits are more vulnerable to changes in the rate of interest.

Nguyen, Vu and Le (2017) evaluated the impact of monetary policy on commercial banks' profit in Vietnam by using panel data regression analysis by collecting data from 20 commercial banks, which were doing business in Vietnam's banking market between 2007 and 2014. Monetary base, discount rate and required reserve ratio were used as proxies for monetary policy. Profit before tax (PAT) was used to represent banks' performance. The results showed that there is a positive relationship between banks' profits and monetary policies. Among the chosen variables representing Standard Bank of Vietnam (SBV's) monetary policy, only monetary base has a significant positive impact on bank's commercial bank' profit in Vietnam.

Doyin-Hassan and Ijeoma (2017) conducted an empirical investigation into the relationship between monetary policy and the performance of banks in Nigeria. The study employed time-series data and econometric models to analyze how changes in monetary policy instruments, including interest rates and reserve requirements, impact the financial performance of banks, particularly Deposit Money Banks. It revealed that changes in monetary policy instruments significantly influence the profitability and financial health of banks. Specifically, interest rate adjustments and other policy measures have discernible effects on key financial performance indicators, highlighting the interconnectivity between monetary policy and banking sector performance.

Aginam and Obi-Nwosu (2017) also explored the effect of monetary policy on the performance of deposit money banks in Nigeria for a period of thirty years (1987 - 2017).

The Ordinary Least Square (OLS) multiple regression technique was adopted for data analysis and findings showed that monetary policy rate, liquidity ratio and broad money supply have positive and significant effects on return on equity (ROE) of DMBs in Nigeria while interest rate has a negative insignificant effect on return on equity of these banks over time.

Punita and Somaiya (2016) investigate the impact of monetary policy on the profitability of banks in India between 1995 and 2000. The monetary variables considered were bank rate, lending rates, cash reserve ratio and statutory ratio. Bank profitability was regressed on each of these monetary variables. Accordingly, the study observed that lending rate exacts a positive and significant influence on banks profitability, while bank cash reserve ratio and statutory ratio were found to have significantly affected profitability of banks negatively. Their findings were the same when lending rate, bank cash reserve ratio, and statutory ratio were pooled to explain the relationship between bank profitability and monetary policy instrument in the private sector.

Gap in Literature

The literature is awash with studies on monetary policy and return on equity (ROE) of Deposit Money Banks. These studies have primarily focused on individual monetary policy tools with less emphasis in understanding how these tools interact and impact return on equity (ROE) of DMBs in Nigeria. Again, many of the reviewed studies concentrated on short-term effects using analytical tools like the bi-variant and multivariate ordinary least square (OLS), pooled OLS, panel pooled regression and random effects, Engel granger two-step cointegration, indirect least square regression, and generalized method of moments; thereby neglecting the long term implications of monetary policy decisions on ROE. Finally, the currency of this study is not in doubt as none of the reviewed studies was executed in 2025. Thus, given the ever changing approaches of the Central Bank of Nigeria (CBN) in tackling price instability and other related macroeconomic problems over the years, this study streamlines the effects of monetary policy, as a tool that works through Deposit Money Banks, on the financial performance of these banks with emphasis on return on equity (ROE).

METHODOLOGY

Having considered a whole lot of design, the most suitable one for this study was the quasi-experimental design. Thus, the study used only secondary data and they were yearly time series data on monetary policy rate, interest rate, liquidity ratio, cash reserve ratio and return on equity (ROE). These data were sourced from the statistical bulletin of the Central Bank of Nigeria, 2023 edition and the World Bank (World Development Indicators). However, the generally model of the study is functionally expressed as:

ROE = F (MPR, INT, LQR, CRR) ……………………………………. (1)

Where:

ROE = Return on Equity
MPR = Monetary Policy Rate
INT = Interest Rate
LQR = Liquidity Ratio
CRR = Cash Reserve Ratio

Data Analytical Method

The Autoregressive Distributed Lag (ARDL) model developed by Pesaran and Shin (1999) in analyzing the long-term impacts of explanatory variables on a dependent variable was adopted in this work. One of the reasons for utilizing the ARDL model among others is based on its robustness for estimating models with small and relatively large observations. More importantly, the ARDL is applied not withstanding whether the variables are integrated of the same order or fractionally integrated (Pesaran & Shin, 1999). Thus, the variables under investigation could be I(0), I(1) or a combination of I(0) and I(1) variables. Again, by allowing for the inclusion of the lagged variables including the lag value of the response variable as independent variable, the ARDL is adjudged to provide opportunity for overcoming the problem of endogeneity often associated with time series data. Hence, the entire process involved stationarity and co-integration tests using Augmented Dickey Fuller (ADF) and Bounds test approaches respectively.

Data Analysis and Interpretation of Results

4.1 Descriptive Analysis

Statistics	ROE	MPR	INT	LQR	CRR
Mean	19.29941	13.88971	24.71206	49.61029	12.11118
Median	18.44500	13.50000	23.55500	47.65000	9.750000
Maximum	43.11000	26.00000	36.09000	104.2000	32.50000
Minimum	0.640000	6.000000	18.36000	26.39000	1.000000
Std. Dev.	7.540850	3.849533	4.354659	15.22638	8.886715
Skewness	0.557200	0.653449	0.494035	1.451541	0.746163
Kurtosis	5.036560	4.739458	2.542304	6.393818	2.336792
Jarque-Bera	7.635074	6.706071	1.679837	28.25666	3.778080
Probability	0.021982	0.034978	0.431746	0.000001	0.151217
Sum	656.1800	472.2500	840.2100	1686.750	411.7800
Sum Sq. Dev.	1876.526	489.0239	625.7808	7650.810	2606.132
Observations	**34**	**34**	**34**	**34**	**34**

Source: Extract from E-Views 10 Output

Table 1 contains the descriptive statistics of the data used for this study. The table shows that the means of Return on equity (ROE), monetary policy rate (MPR), interest rate (INT), liquidity ratio (LQR) and cash reserve ratio (CRR) between 1990 and 2023 are roughly 19.3%, 13.9%, 24.7%, 49.6% and 12.1% with corresponding standard deviations of 7.5%, 3.8%, 4.4%, 15.2% and 8.9%. Down the table, it was shown that the aforementioned variables were all skewed to the right with all positive values of 0.557200, 0.653449, 0.494035, 1.451541 and 0.746163. However, the variables INT and CRR were normally distributed as the probability values of Jarque-Bera statistic for these variables are greater than 5% (0.05).

Unit Root Test

Variables	ADF Statistic	5% Critical Value	Probability Value	Level of Integration
ROE	-3.753276	-2.954021	0.0077	I(0)
MPR	-3.110801	-2.954021	0.0354	I(0)

INT	-3.392395	-2.954021	0.0185	I(0)
LQR	-3.128783	-2.954021	0.0340	I(0)
CRR	-5.272017	-2.957110	0.0001	I(1)

Source: Extract from E-Views 10 Output

From table 2 above, it was revealed that the variables ROE, MPR, INT and LQR were integrated at level, I(0); while the variable CRR was integrated at first difference, I(1). Given that the variables have a mixed order of integration, the ARDL (Autoregressive Distributed Lag) approach was considered the most appropriate for the study (Pesaran & Shin, 1999).

ARDL Short Run Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ROE(-1)	0.082439	0.169795	0.485523	0.6329
ROE(-2)	0.224465	0.153145	1.465699	0.1591
ROE(-3)	-0.458212	0.190507	-2.405225	0.0265
MPR	1.774826	0.408194	4.347992	0.0003
INT	-0.966319	0.429091	-2.252016	0.0363
LQR	-0.125186	0.096851	-1.292560	0.2117
LQR(-1)	0.137413	0.092257	1.489456	0.1528
LQR(-2)	0.053819	0.091806	0.586224	0.5646
LQR(-3)	-0.193441	0.085815	-2.254171	0.0362
CRR	-1.378108	0.485685	-2.837451	0.0105
CRR(-1)	1.481198	0.563856	2.626906	0.0166
C	28.11517	11.18965	2.512605	0.0212

R-squared	0.667423	Mean dependent var	19.13484
Adjusted R-squared	0.474879	S.D. dependent var	7.884606
S.E. of regression	5.713599	Akaike info criterion	6.608221
Sum squared resid	620.2590	Schwarz criterion	7.163312
Log likelihood	-90.42742	Hannan-Quinn criter.	6.789167
F-statistic	3.466334	Durbin-Watson stat	2.220227
Prob(F-statistic)	0.008544		

*Note: p-values and any subsequent tests do not account for model selection.

Source: E-Views 10 Output

The above table revealed that holding the variables in the ARDL model constant, the value of return on equity (ROE) will be about 28.12 units. It also shows that one year lag (-1) of return on equity (0.082439) and monetary policy rate (1.774826) have positive effects on current year ROE while liquidity ratio (-0.125186), interest rate (-0.966319) and cash reserve ratio (-1.378108) have negative effects on current period return on equity. Equally, the table above revealed that the adjusted R-squared is 0.474879 (47.49%) and F-statistic is 3.466334 with a probability value of 0.008544 (< 0.05), which implies that the explanatory variables (ROE(-1), ROE(-2), ROE(-3), MPR, INT, LQR, LQR(-1), LQR(-2), LQR(-3), CRR and CRR(-1)), have a joint significant effect of about 47.49% on current period return on equity of deposit money banks in Nigeria. Finally, the value of Durbin Watson (DW) statistic is 2.220227, which implies absence autocorrelation as the value of DW

statistic falls between the threshold of 1.5 and 2.5. Put differently, the result indicates that there is no correlation between the errors (residuals) of the model as anticipated.

Bounds Test

ARDL Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.717453	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
			Finite Sample: n=35	
Actual Sample Size	31			
		10%	2.46	3.46
		5%	2.947	4.088
		1%	4.093	5.532
			Finite Sample: n=30	
		10%	2.525	3.56
		5%	3.058	4.223
		1%	4.28	5.84

Source: E-Views 10 Output

Bounds test revealed that there is cointegration between the variables. In other words, there is a long run equilibrium relationship between monetary policy and return on equity (ROE) of deposit money banks in Nigeria because the value of F-statistic (4.717453) is above the Pesaran, Shin and Smith (2001) upper bound 5% critical value of 3.49.

4.5 ARDL Long Run Estimation

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MPR	1.541574	0.317828	4.850340	0.0001
INT	-0.839323	0.364027	-2.305660	0.0326
LQR	-0.110653	0.136087	-0.813101	0.4262
CRR	0.089541	0.210860	0.424648	0.6759
C	24.42020	9.211122	2.651165	0.0158

EC = ROE - (1.5416*MPR -0.8393*INT -0.1107*LQR + 0.0895*CRR + 24.4202)

Source: E-Views 10 Output

Long run analysis indicated that monetary policy rate and cash reserve ratio have positive effects of 1.541574 and 0.089541 on ROE of Nigerian banks while interest rate and liquidity ratio have negative effects of -0.839323 and -0.110653 on DMBs' return on equity in Nigeria. The analysis subsequently revealed that monetary policy rate and interest rate have significant effects as their probability values (0.0001 and 0.0326) are less than 5% (0.05) level of significance; while the effects of cash reserve ratio and liquidity ratio are insignificant as their probability values of t-statistic (0.4262 and 0.6759) are greater than 5% (0.05).

4.6 ECM Estimation

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROE(-1))	0.233747	0.178311	1.310895	0.2055
D(ROE(-2))	0.458212	0.159722	2.868816	0.0098
D(LQR)	-0.125186	0.066940	-1.870140	0.0770
D(LQR(-1))	0.139622	0.064346	2.169852	0.0429
D(LQR(-2))	0.193441	0.062580	3.091115	0.0060
D(CRR)	-1.378108	0.387080	-3.560270	0.0021
CointEq(-1)*	-1.151308	0.192545	-5.979409	0.0000

R-squared	0.735794	Mean dependent var	-0.177419
Adjusted R-squared	0.669743	S.D. dependent var	8.846160
S.E. of regression	5.083712	Akaike info criterion	6.285640
Sum squared resid	620.2590	Schwarz criterion	6.609443
Log likelihood	-90.42742	Hannan-Quinn criter.	6.391192
Durbin-Watson stat	2.220227		

* p-value incompatible with t-Bounds distribution.

Source: E-Views 10 Output

From the Error Correction Model (ECM) result, the cointegrating equation has the desired negative and significant signs of -1.151308 and 0.0000 respectively. The latter (p-value of ECM equation) is significant because it is less than the adopted 5% (0.05) level of significance. In essence, in event where there is any distortion or shock to the established long run equilibrium relationship between monetary policy and ROE of DMBs in Nigeria, the speed at which equilibrium will be reestablished is about 115% per annum.

Diagnostic Tests

Test	Criterion	F-Statistic	P-value
Autocorrelation	Q-Statistic	-	> 0.05
Normality	Jarque-Bera	2.309559	0.309559
Multicollinearity	Variance Inflation Factors	< 5	-
Serial Correlation	Breusch-Godfrey LM Test	0.354858	0.7063

Source: Extract from E-Views 10 Output

Given the results above, there is absence of autocorrelation in the model, the errors of the model mirror a normal distribution; there is absence of correlation between the explanatory variables of the model; and there is no presence of serial correlation in the model.

Discussion of Findings

The study revealed that monetary policy rate has positive and significant effects on return on equity of Deposit Money Banks in Nigeria. In essence, an increase in monetary policy rate, the mother of all rates, will enhance the returns on banks. This outcome of the study agrees with the position expressed by Mokuolu (2024) and Oyakhiromhe and Ezu (2024). However, the study expected a negative association because an increase in monetary policy rate ordinary will trigger bank lending rate which will reduce bank lending and adversely affect banks' return on equity all things being equally. This supposed anomaly may be because banks in Nigeria are allowed to keep excess reserves which they lend to preferred sectors and creditworthy customers not minding the prevailing monetary policy rate.

Secondly, interest rate has a negative and significant influence on the ROE of Deposit Money Banks in Nigeria. This implies that an increase in interest (lending) rate reduces the loan portfolio of banks which adversely affects the profitability of banks and the returns of shareholders drop. Similar outcome were reported by Mokuolu (2024); Omankhanlen, Isibor and Okoye (2020); and Nguyen, Vu and Le (2017). However, the effect of interest rate on the ROE of banks was observed to be negative possibly because emphasis here is on maximum lending rate while a significant chunk of bank lending are done using prime lending rate as emphasis is on short term self-liquidating loans.

Thirdly, the response of deposit money banks ROE to changes in liquidity ratio is insignificant and negative. The study nonetheless expected the effect not be only negative but also significant because a monetary policy aimed at contrasting economic activities will push liquidity ratio, a secondary reserve, upwards which will reduce the reserve of banks and reduce the lending ability of DMBs. This in essence will negatively affect the profit level of these banks which ordinarily will reduce the returns shareholders are entitles to at the end of the day (Kumar, Acharya & Ho, 2020). However, the high level of inefficiencies the Nigerian money and capital markets are saddled with may be responsible for the insignificant effects observed between liquidity ratio and return on equity of Nigerian banks.

Finally, cash reserve ratio, a primary reserve, has a negative significant effect on return on equity (ROE) of banks in Nigeria. The first part of this result was expected because increasing the cash ratio of the bank system will automatically reduce the lending ability of banks which will reduce the profit level of banks and subsequently their returns to shareholders (Younus & Akhtar, 2019; Doyin-Hassan & Ijeoma, 2017). Nevertheless, the volume of money outside the banking system may account for the negative effect of cash reserve ratio on return of banks in Nigeria.

CONCLUSION AND RECOMMENDATIONS

Given that four monetary policy tools were considered (monetary policy rate, interest rate, liquidity ratio and cash reserve ratio) and only liquidity ratio was statistically

insignificant, the study concluded that monetary policy has a significant effect on the ROE of deposit money banks in Nigeria. This is a pointer to the effectiveness and/or potency of monetary policy as a major stabilization tool. Hence:

1. There is need for relevant authorities like the Central Bank of Nigeria to optimize monetary policy rate. Hence, given the positive and significant effects of monetary policy rate, relevant stakeholders can consider using monetary policy rate as a tool to boost the profitability of deposit money banks in Nigeria.
2. Policy makers should be cautious when adjusting interest rates, as it may negatively impact banks' profitability. A balance approach to interest rate management is as such necessary.
3. The monetary authority should consider reducing the cash reserve ratio in order to increase Deposit Money Banks' lendable funds and improve profitability.
4. The results notwithstanding, it is important for policymakers to monitor banks' liquidity levels in order to ensure they maintain a healthy balance between liquidity and profitability.

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