

Effect of Monetary Policy on the Performance of Deposit Money Banks in Nigeria

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ABSTRACT

This study assessed the effect of monetary policy on the performance of deposit money banks in Nigeria. Specifically, the study examines the effect of monetary policy rate, liquidity rate, lending rate and cash reserve ratio on the performance of deposit money banks in Nigeria. Secondary panel data spanning 2006-2021 was gathered for five (5) leading deposit money banks. Data gathered was estimated using descriptive statistics and multicollinearity test; pooled OLS estimation, fixed and random effect analysis. Discoveries from the study revealed that monetary policy rate on return on equity is positive and insignificant with coefficient estimate of .0007 ($p=0.065>0.05$); lending rate exerts negative significant effect on return on equity of deposit money banks in coefficient estimate of -0.4557 ($p=0.030<0.05$); liquidity ratio exerts negative significant effect on return on equity with coefficient estimate put at -0.0029 ($p=0.007<0.05$); and cash reserve ratio affects return on equity of DMBs negatively and significantly with coefficient estimate of -0.0066 ($p=0.045<0.05$). Premised on these findings, the study suggested that the Central Bank of Nigeria should consistently moderate monetary policy rates to make them highly attractive towards guaranteeing optimally sustainable performance of banks; the Central Bank of Nigeria should ensure that adequate monitoring of DMBs liquidity is ensured to aid banks ability to mobilize credit and boost profitability; lending rate should be made affordable by the CBN and credit reserves should be adequately monitored by the CBN to match with the variations in the macroeconomy.

Keywords: Monetary Policy, Deposit Money Bank, Return on Equity, Lending Rate, Liquidity Ratio,

I. INTRODUCTION

Over the years, deposit money banks have strived to sustain their significance in the economy

of Nigeria, and thus they have explored several works and services towards maximizing revenue, boost profit and consolidate their performance (Umar, Iliya, Nazeef & Rabi, 2022). The essence of ensuring consolidated performance is premised on the essence of an effective deposit money banking sector in a country where economic growth and development is urgent. The intermediation role of deposit money banks (DMBs) which is predicated on sound performance of banks within the economy ensures effective mobilization of funds from the surplus side of the economy to the side with huge deficit, this which help lenders meet investment financial requirement ultimately occasions growth in the economy (Azeez & Ilori, 2021). However, government has due to the peculiarity of the banking sector and the need to sustain their importance in the economy significantly involved itself in the activities of DMBs with monetary policies which it harnesses on to regulate the banking sector.

Monetary policy concerns the use of monetary instruments to control the amount, cost, steady availability and pattern of mobilization of money and credit towards attaining certain macroeconomic objectives which includes full employment, price stability, favorable inflation level and economic prosperity (Mishkin, 2013). It represents one of the macroeconomic tools leveraged upon by nations to effectually control and cause productivity of their economy (Umar et al., 2022). In Nigeria, the Central Bank affirmed that the basic objective of monetary policy is to guarantee stability of price and consolidated economic growth; the implementation of framework of the policy occurred in the country in two phases, that is before the Structural Adjustment Program (SAP) of 1986 and the period beyond demonstrated efforts by the apex bank to directly control both interest rate and exchange rate as it affects the economy (Matousek & Solomon, 2018; CBN, 2009). Despite this, government through the

CBN also desired to mobilize cheap credit to diverse sectors of the economy that unarguably leads economic productivity; even though the goal of the government with the implementation and moderations in monetary policies are most times not attained, these policies have caused distortions, impediments and utter inefficiency of DMBs which consequently affects its role in the economy (Umar et al., 2022).

Banks like other firms in other various sectors have performance, solvency and liquidity targets amidst urgent need to effectually perfect the intermediation role; howbeit, they operate within the ambit of the monetary and banking policies delivered by the economy that could either enhance performance of DMBs or constrain it. The Central Bank has exerted a lot in ascertaining monetary stability using policies such as cash reserve ratio, capital requirement, central bank rate, liquidity requirement amongst others. These efforts and developments are harnessed to cushion the effect of liquidity transmission via deposit base and credit facilities by DMBs, even though they have almost failed in reaching optimal efficiency in this regard (Omankhanlen, 2014). Again, indirect instruments of monetary policy are also deployed on a constant basis to put liquidity demand pressures under check while lending activities by banks has steadily posed issues to the development of the economy; this which negates the expected result is occasioned by the disregard of stipulated requirements for issuing loans and advances by most banks which has triggered setbacks in the strive to reduce macroeconomic uncertainties. Most banks relate their non-cooperation to the consistent shoot up in monetary policy rate in recent time while others claim that monetary policy requirements including cash reserve ratio and liquidity ratio have frustrated their efforts to align themselves with the goal of the apex bank (Umar et al., 2022).

However, the Central Bank explores these policies for peculiar purposes. The cash reserve ratio is a share of DMBs deposit liabilities to be kept with the apex bank, the investment is maintained at no interest in the cash reserve ratio account; any reduction in the liquidity of the rate shoots up DMBs lending capacity. Similarly, the central bank rate is the lowest interest rate paid by the banks to the Central Bank on loans, it signals attempts as an increase in the rate implies an increase in loan rate offered by banks; the intention of the CBN when it moderates this rate is to either tighten or loosen banks credits, but most times it is intended to mop up money in the economy maybe towards regulating inflation rate in the country (Cavaliere, Muda, Khan, Shameem, Vijayalakshmi,

Chakravarthi, Rajest and Regin, 2021). Also, the Central Bank open market operations, purchases and sales of qualifying shares are also exertions of the institution to trace financial supply and credit conditions even though they are considered to make short-term changes in the economy. Above all, the goal of monetary policy is to create monetary policy targets that should guarantee fixed interest rate, drag down cost of doing business through appreciable increase access to financial opportunities for corporate firms and individuals throughout the economy.

Statement of the Problem

Deposit money banks has utterly failed in meeting the financial needs of corporate firms and individuals as they have per time struggled with sound performance under the Central Bank's monetary policy regulation; hence, banks have been limited from carrying out their activities in their own way adopting measures that would ensure the achievement of their goals. Instead, the apex bank in its bid to regulate the economy distorted the operations of banks particularly with regard to liquidity, loan and advances which exert adverse effect on the profitability and consequently performance which is the basic objective of every bank. The liquidity of banks has critically been influenced with the consistent change in monetary policy thus causing banks to face ineffectiveness in their operations; more importantly, monetary policy rates introduced by the CBN has most times been aggressive thereby constraining bank's liquidity and reducing their ability to satisfactorily meet long term financial obligations. this which also reduce the amount of money within the banking space hinders bank's ability to grant credit and mobilize deposits; this has ripple effect on the bank operations as it despite dragging down performance also causes almost no change in money supply thereby reducing the operations and transactions carried out by DMBs.

In fact, monetary policies which are occasioned to intervene in the activities of deposit money banks have rather overtime limited banks from harnessing their full potential, this may be related to the issue with an ideal level of intervention required to boost performance of banks and sustain the efficiency of the banking sector as it is a precursor for economic growth (Udeh, 2015). The certain effect of the consistent monetary policies moderations on the performance has not been adequately established as there has been clash in the findings obtained in researches conducted even in recent time; for instance in Nigeria, Olaifa (2022), Umar, Iliya, Nazeef and

Rabiu (2022), Ifurueze, (2022) established positive relationship between monetary policies and DMBs performance while Kithandi, (2022), Denis (2021), Ejem and Ogbonna, (2020), although these studies adopted time series approach measuring the performance of DMBs with industry measures; this has which dominates the literature requires a more specific focus on the association of monetary policies and performance of individual banks which would cover bank characteristics and consider if it could cushion the usual adverse effect of monetary policy on DMBs performance.

Although there exist a few studies in literature including Kithandi, (2022) and Cavaliere et al(2021) that considered bank specific measure of performance in assessing the impact of monetary policy but these authors focused on other developing countries which does not include Nigeria. More importantly, having noticed other strand of studies for instance Hoque, Ahmad, Chowdhury and Shahidulah (2020) in literature adopted pooled OLS which could have mediated the divergent findings that has littered the literature, they failed to capture the interplay of bank size and time factor on the connection between monetary policy and DMBs performance; hence this study would give attention to this gap using Least Square Dummy Variable (LSDV), fixed effect and random effect estimations while considering the recent monetary policy developments and their impact on the performance of DMBs in Nigeria.

II. LITERATURE REVIEW

Conceptual Review

Monetary policy is the process by which the apex bank and monetary authority in a country regulate the money supply, and cost of money to attain a set of objectives towards the growth and stability of the economy (Mohanty, 2012). Monetary policy rests on the relationship between the rates of interest in an economy, that is the price at which money can be borrowed, and the total supply of money (Sunday, Garba, Arigo, Kufre, Suleiman, Ojegwo & Ogbuechi, 2016). Monetary policy uses a variety of tools to direct economic growth, inflation, exchange rates with other currencies and unemployment (Enahoro, Jayeola & Onou, 2013). Where currency is under a monopolistic issuance, or where there is a regulated system of issuance of currency through banks which are tied to the apex bank, the monetary authority has the ability to alter the money supply and thus influence the interest rate to achieve policy goals (Belke & Osowski, 2016). It is important for policy makers to make credible policies, if private agents (consumers and firms)

will believe that policy makers are committed to lowering inflation and to anticipate general future lower prices. If an employee expects prices to be high in the future, wage contracts will draw up to match these prices. Hence, the expectation of lower wages is reflected in wage-setting behaviour between employees and employers (lower wages since prices are expected to be lower) and since wages are lower, there will be no demand-pull inflation because employees will receive smaller wages; and there will be no cost push inflation because employers will pay out less in wages (Belke & Osowski, 2016). A high wage will increase a consumer's demand (demand pull inflation) and a firm's costs (cost push inflation), so inflation arises.

If policymakers' policies regarding monetary policy are not credible, policy would not have the desired effect. If policymakers believe that private agents anticipate low inflation, they have an incentive to adopt an expansionist monetary policy (where the marginal benefit of increasing economic output outweighs the marginal cost of inflation). However, if private agents have rational expectations, they know that policymakers have this incentive (Enahoro et al., 2013). Hence, the reputation of the Apex Bank is not necessarily tied to past performance, but rather to particular institutional arrangements that markets can use to form inflationary expectations (Belke & Osowski, 2016).

In Nigeria, the transition to market-based monetary control commenced in 1993 when the CBN adopted the Open Market Operations (OMO) as an indirect monetary instrument. Before then, the CBN had relied on a battery of direct controls for liquidity management. The direct control measures had included ceilings on domestic credit expansion, ceilings on interest rates, selective credit policies, fixed exchange rate, as well as cash and liquidity ratios (Enahoro et al., 2013). Supplementary reserve requirements were also imposed in the form of mandatory purchase of stabilisation securities by banks as well as the demand for special deposits maintained by the banks. OMO aims to control the monetary base by focusing on bank reserves, which is a variable that the CBN can more readily control by applying the instruments at its disposal. Targeting bank reserves is expected to keep the monetary base and ultimately, the broad money supply at desired non-inflationary levels. The CBN regulates the optimal demand for total bank reserves followed by an estimation of the total supply of bank reserves to achieve the OMO target. If there is an excess supply of reserves, OMO will seek to mop up the

excess reserves and if there is a shortage, the aim of monetary policy will be to inject reserves (Alesina, Favero, & Giavazzi, 2014). OMO is conducted using Treasury Bills as the sole intervention security and is implemented exclusively through licensed discount houses which constitute the secondary market for these securities. Auctions of securities take place once a week with written notices sent to all banks before the auction. The banks then submit open bids comprising the discount rate and the volume of subscription to the discount houses that in turn make bids to the CBN. The total bids received are collated and arranged in descending order of prices. In theory, the CBN accepts the highest bid price (lowest discount rate) for sales and the lowest prices offered (highest discount offer) for purchases. The CBN had regulated cut-off yields at the auctions such that excessive high bidders often failed to get allocations. This suggests that the CBN systematically eliminated outliers in arriving at the final rates.

In 1999, the CBN raised the rates on treasury bills to an all-time high of 18%, indicating a greater willingness to make treasury bills competitive. The bidding process ends when discount houses allot treasury bills to dealers whose bids are accepted (Enahoro et al., 2013). Treasury bill holders who are pressed for funds can discount them with licensed discount houses, thereby assuring the necessary liquidity for these securities. In 1996, the CBN commenced repurchase transactions (Repos) with discount houses, involving the purchase or sale of government securities with an obligation to reverse the transaction on an agreed date. This move has served to further enhance OMO flexibility (Alesina et al., 2014; Abdulazeez, 2016). Prior to 1999, commercial banks enforced the use of stabilisation securities, non-negotiable instruments of the CBN. It was mandatory for banks to buy from these instruments time to time. The use of the instruments which imposed significant costs on the banks was later discontinued. In October 2019, the authorities restricted private individuals and non-banking firms from purchasing short-term central bank securities via Open market Operations (OMO); the reduction in the market size for OMOs to contain banks and foreign corporates is towards attenuating the liquidity of the market and ultimately control inflation.

Theoretical Review

The market power theory was introduced by Bhagwati (1965). The authors introduced two hypotheses, viz: the relative-market power

hypothesis and the traditional structure- conduct performance hypothesis. They argued that the relative-market power hypothesis states that price determination and more profit making is reserved only for big banks, big name with recognizable brand. On the contrary, the traditional-structure conduct performance hypothesis suggests that because of diminished competition, higher markets with more firms results in higher loan rates and lower rates of deposits while the variation in the two hypotheses holds depending on whether the market power is generic to a market or specific to market's individual banks.

Market power specifies how firms in a market influence prices and reveals the level of competition in the market. A competitive financial market has a positive impact not only on the wellbeing of the stakeholders, but also on the country's economy. Healthy competition in a financial system promotes the productivity of the real sector. There is a good reason why competition is very important in the deposit money market: the degree of competition in the financial sector can matter for the efficiency of the production of financial services, it can matter for the quality of financial products and the degree of innovation in the sector (Claessens & Laeven, 2003; Ajisafe & Akinlo 2014). The competitive conditions of deposit money market; as an arm of financial system; has major implications for the effectiveness of certain instruments of monetary policy such as discount rate and required reserve (Bikker, 2003). Hence, the impact of monetary policy on financial prices and quantities is conditioned on the degree of individual firms in the financial market to exploit credit demand and deposit supply functions.

The importance of market power theory to this study is underpinned on the grounds of bank size, brand name and the monopolistic nature of the banking industry in Nigeria. These variables have significant impacts on the performance of banks.

Empirical Review

Olaifa (2022) investigated the effect of monetary policy on bank performance in Nigeria. The qualitative and quantitative research design was used in the study. Secondary time series data covering 1988-2015 was gathered in the study. Data obtained was analyzed using descriptive statistics and simple regression analysis. Findings from the study revealed that foreign exchange rates and cash reserves ratio had negative impacts on deposit money banks profit and that deposit money banks interest rates had positive and significant impacts on deposit money banks profit. Following the findings obtained in the study, it was concluded

that monetary policy affects banks performance in the Nigerian Economy.

Umar, Iliya, Nazeef and Rabi (2022) evaluated the effect of monetary policy on the performance of deposit money banks in Nigeria. The qualitative and quantitative research design was used in the study. Secondary time series data covering 1988 to 2019. Data gathered was estimated using Autoregressive Distributed Lag (ARDL) approach. Finding from the study demonstrated that both in the longrun and short run, bank lending rate has been found to have a significant positive impact on banks loans and advances; bank lending rate has significant positive impact on the performance of deposit money banks in Nigeria; liquidity rate has significant impact in the long run but has no significant impact in the short run likewise interest rate has no significant impact in the long run but in the short run has significant and positive impact on the performance of deposit money banks. Hence, the study suggested that the central bank of Nigeria should redefine its monetary policy instruments to make them more attractive to the banks.

Ifurueze (2022) analyzed monetary policy instruments and performance of financial sector in Nigeria. The ex-post facto research design was used in the study. Secondary time series data covering 1988-2020 was gathered in the study. Data obtained was analyzed using ADF unit root test, ARDL bound test and Autoregressive Distributed Lag (ARDL) analysis. Discoveries from the study demonstrated that monetary policy instruments have significant short run policy effect but no significant long run effects on insurance sector output in Nigeria; monetary policy instruments have no long run effect on banking sector; monetary policy instruments have no long run effect but has positive and significant short run effect on value of money market institutions in Nigeria. Based on the findings, the study suggested that relevant regulatory agencies in the capital market should formulate policies that would enhance the efficiency and transparency of the market in order to improve investors' confidence which will in turn enhance effective social economic and political institutions activities in the Nigerian environment; need to ensure that the channels of capital market induced growth are built around effective systems and that the policy institutions are actively involved in making systemic checks and appropriate policy innovations to ensure capital market led economic development and regulators and major operators should try to give adequate enlistment on the activities of the market, most especially emphasizing it as a source

of cheap long-term funds compared to the money market for industrial growth.

Osakwe, Okoye, Ezeala and Okeke (2021) assessed the effects of monetary policy instruments on the performance of deposit money banks in Nigeria. The study specifically, ascertained the effect of monetary policy rate on the total private sector credit of deposit Money Banks; determined the effect of the liquidity ratio on the total private sector credit of deposit Money Banks and assessed the effect of the cash reserve ratio on the total private sector credit of deposit Money Bank The ex-post facto research design was used in the study. Secondary time series data covering 2000-2020 was obtained in the study. Data gathered was analyzed using descriptive statistics and ordinary least square regression analysis. Findings from the study showed that total private sector credit of deposit money banks has a significant relationship on monetary policy rate; liquidity ratio and cash reserve ratio and loan to deposit ratio has an insignificant relationship with total private sector credit of deposit money banks. The study therefore recommended among others that the central bank of Nigeria should redefine these monetary policy instruments to make them more attractive to the banks.

Denis (2021) evaluated the impacts of monetary policy on the performance of deposit money banks (DMBs) in Nigeria. The study specifically examined the impact of cash reserve ratio, money supply, central bank exchange rate and monetary policy rate on the performance of DMBs in Nigeria and determined the moderating impact on the relationship between monetary policy and performance of DMBs in Nigeria. The causal research design was used in the study. Secondary panel data covering 2013-2019 was gathered for seventeen (17) DMBs in Nigeria. Data gathered was analyzed using descriptive statistics, correlation analysis and panel pooled regression and random effect analysis. Discoveries from the study demonstrated that monetary policy rate, CBN exchange rate and cash reserve ratio have negative impacts on the performance of DMBs in Nigeria; moderating variable of bank size also showed a weak significant positive impact on performance; monetary policy rate and bank size as well as money supply and bank size. Hence, the study recommended that the monetary authority should tread with caution in manipulating the monetary instruments to achieve certain macroeconomic objectives so as not to impact heavily on DMBs performance while DMBs management were advised to be conscious of the monetary policy and

strategize ways to improve in their performance amidst adverse policy prescriptions.

Azeez and Ilori (2021) explored the effects of monetary policy on performance of Nigerian deposit money banks. The qualitative and quantitative research design was used in the study. Annual time series data spanning thirty (30) years (1989-2019) was gathered in the study. Data gathered was analyzed using Augmented Dicker Fuller (ADF) unit root test, ARDL bound test and Autoregressive distributed lag (ARDL) analysis. Discoveries from the study indicated that in the long run, the result of the estimated coefficients of the long run relationship exhibits that BDR and liquidity ratio are significant and exhibits a negative relationship with total bank deposit while cash reserve ratio is significant and exhibits positive relationship with total bank deposit and bank lending rate also exhibits positive relationship with total bank deposit but is not significant. On the basis of these findings, the study recommends among others that Central Bank of Nigeria (CBN) should moderate the deposit rate as an instrument for regulating deposit money banks operations and performance.

Gimba, Vincent and Oyedokun (2020) evaluated the effect of monetary policy on the performance of listed deposit money banks in Nigeria. The ex-post facto research design was used in the study. Panel time series data covering 2006-2018 was gathered in the study for DMB in Nigeria. Data gathered was analyzed using descriptive statistics, correlation analysis and ordinary least square (OLS). Findings from the study evidenced that monetary policy has significant effect on the performance of listed deposit money banks in Nigeria. Following the findings, the study suggested that Central Bank of Nigeria should manage the monetary policy rate properly, with the recent increase of loan to deposit, government should also employ other measures to control the loan to deposit and the monetary authorities should also minimize the 22.5 % cash reserve ratio in order to influence the level of bank performance with capacity to raise a volume of funds and also reduce the liquidity ratio from 30% to 25% to prevent the banks from folding up.

Alalade, Oseni and Adekunle (2020) assessed monetary policy and financial performance of deposit money banks in Nigeria. The quantitative research design was used in the study. Secondary annual time series data covering 1984 to 2018 was obtained and estimated using descriptive statistics, ADF unit root test and Autoregressive Distributed Lag analysis. Findings

from the study indicated that liquidity ratio, lending rate, loans to deposit ratio and cash reserve ratio had no significant effect on the log of net worth; in the short run, variations in the liquidity ratio, loans to deposit ratio and the cash reserve ratio for previous years had significant effect on the log of net worth in the current year; when financial performance is measured as total credits, the liquidity ratio and loans to deposit ratio had positive significant effect in the long run; cash reserve ratio had a negative significant effect in the long run and lending rate was insignificant in both the long and short run. Hence, the study advocated for increases in the liquidity ratio in the current year be made by the Central banks of Nigeria and reduction in the cash reserve ratio is necessary for improvements in the financial performance of deposit money banks in the current and future years.

Uruakpa (2019) examined the impact of monetary policy on deposit money banks' performance in Nigeria. The study particularly analyzed the relationship between cash reserve ratio (CRR) and credit to the private sector in Nigeria and to determine if liquidity ratio (LQR) has impact on credit to the private sector in Nigeria. The quasi-experimental research design was used in the study. Secondary time series data covering 1986-2015 was gathered and estimated using regression analysis, co-integration and granger causality test. Findings from the study demonstrated that cash reserve ratio and money supply have positive and significant relationship with credit to the private sector; liquidity ratio has negative and insignificant relationship with credit to the private sector while monetary policy rate has positive and insignificant relationship with credit to the private sector; findings further revealed that credit to the private sector has unidirectional causality relationship with cash reserve ratio and money supply while there is no causality relationship between credit to the private sector, liquidity ratio and monetary policy rate. Hence, the study suggested that the CBN should continuously adopt all instruments investigated to regulate banking activities.

Adesina, Nwidobie and Amadi (2018) assessed monetary policy and financial performance of Nigerian deposit money banks. The survey research design was used in the study. Secondary annual time series data covering 2000-2016 was gathered in the study. Data obtained was estimated using Autoregressive Lag Model (ARDL). Findings from the study revealed that monetary policies of the CBN had a significant effect on the performance of DMBs in the short-run

but an insignificant effect in the long-run. Premised on the findings established in the study, it was recommended that CBN should intensifies its monetary policy strategies in controlling the activities of money deposit banks in the short run as this policy has been found effective; in the long run, CBN should make use of other regulatory tools to control the activities of deposit money banks for the achievement of macroeconomic objectives and deposit money banks should explore other means of boosting their earnings apart from the traditional customers' loans and risk assets.

Aginam and Obi-Nwosu (2017) explored the effect of monetary policy on the performance of deposit money banks in Nigeria. The ex-post facto research design was used in the study. Secondary time series data spanning thirty (30) years (1987-2017) was gathered in the study. Data gathered was estimated using Augmented Dicker Fuller and Philip Perron tests for unit roots and Ordinary Least Square (OLS). Findings from the study evidenced that monetary policy rate, liquidity ratio and broad money supply have positive and significant effect on return on equity and interest rate has negative and insignificant effect on return on equity. Based on these findings, the study suggested that interest rate should be reduced to a single digit; bank management should ensure that capital is properly channeled to the productive sector of the economy; relevant monetary authorities should apply with caution monetary policy variables to significantly influence commercial banks loans and advances and expansionary monetary policy should be adopted by the CBN to force down interest rate and increase money supply because a fall in the bank rate will reduce interest on loans made by commercial banks.

III. METHODOLOGY

Model Specification

The model of Denis (2021) was harnessed in this study, the author explored the impacts of monetary policy on the performance of deposit money banks (DMBs) in Nigeria. Having considered the significance of specific effect of monetary policy on bank's performance with attention to bank size, the study explored the relationship between monetary policy variables and performance of DMBs. For simplicity, the model of Denis (2021) is demonstrated below for clarity:

$$ROE = f (MPR, EXR, M2, CRR, \mu_e) \dots \dots \dots 3.1$$

Stated in more functional forms the equation term of the model becomes;

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \epsilon_{it} \dots \dots \dots 3.2$$

Where:

- ROE = Return on Equity
- MPR = Monetary Policy Rate
- EXR = Exchange Rate
- M2 = Money Supply
- CRR = Cash Reserve Ratio
- f = Functional Notation
- $\beta_0 - \beta_4$ = Coefficients Of Estimates

Howbeit, the model of Denis (2021) as shown above does not capture bank size and lending rate which stands as a strong determinant of bank's potential to perform its basic intermediation function. In effect, the study's estimation does not reflect the moderating effect of bank size as incorporated in fixed effect panel estimation which basically estimate relationship of these variables without considering the dynamic relationship. The modified model factors in dynamic relationship into the model using panel least square dummy variables, the size of the banks used in the study and time factor and how these indices affect or moderate the impact of monetary policies on the performance of DMBs in Nigeria. Based on these observations, the modified model is demonstrated below.

$$ROE = f (MPR, LDR, LIQ, CRR, MOS, FIS, U) \dots \dots \dots 3.3$$

$$ROE = f (MPR_t, LDR_t, LIQ_t, CRR, MOS_t, FIS_t) \dots \dots \dots 3.4$$

Pooled OLS Model

$$ROE_{it} = \delta_0 + \delta_1 MPR_{it} + \delta_2 LDR_{it} + \delta_3 LIQ_{it} + \delta_4 CRR_{it} + \delta_5 MOS_{it} + \delta_6 FIS_{it} + \mu_1 \dots \dots \dots 3.5$$

Least Square Dummy Variable (LSDV) Fixed Effect Model

$$ROE_{it} = \alpha_0 + \alpha_1 D_{2(Access)} + \alpha_2 D_{3(UBA)} + \alpha_3 D_{4(GTB)} + \alpha_4 D_{5(FIRST BANK)} + \alpha_5 D_{5(ZENITH)} + \delta_1 MPR_{it} + \delta_2 LDR_{it} + \delta_3 LIQ_{it} + \delta_4 CRR_{it} + \delta_5 MOS_{it} + \delta_6 FIS_{it} + \mu_2 \dots \dots \dots 3.6$$

Random Effect Model

$$ROE_{it} = \gamma_0 + \gamma_1 MPR_{it} + \gamma_2 LDR_{it} + \gamma_3 LIQ_{it} + \gamma_4 CRR_{it} + \gamma_5 MOS_{it} + \gamma_6 FIS_{it} + \mu_3 + \epsilon_i \dots \dots \dots 3.7$$

Where:

- ROE = Return on Equity
- MPR = Monetary Policy Rate
- LDR = Lending Rate

LIQ = Liquidity Ratio
 CRR = Cash Reserve Ratio
 MOS = Money Supply
 FIS = Firm Size

Sources of Data

Data considered in this study are secondary data which was gathered from the published financial statements of deposit money banks listed on the Nigeria Stock of Exchange; howbeit, this study particularly considered First Bank, United Bank for Africa, Guaranty Trust Bank, Access-Diamond Bank and Zenith Bank (FUGAZ) as they have remained the biggest banks in the sector. Data amassed from the financials of source spanned from 2006-2021 as stated in the scope of the study.

Method of Data Analysis

The study employed both descriptive and panel statistical analyses. The Descriptive analysis shows the measure of central location and measure

of dispersion, normality status, skewness, kurtosis of all the variables included in the model of the study. However, panel statistical estimations conducted in the study includes pooled ordinary least square regression analysis (random effect, fixed time specific and firm specific effect) and other post estimation tests.

IV. RESULTS AND DISCUSSION

This chapter presents results of analysis conducted in the quest to assess the effect of monetary policy on the performance of deposit money banks in Nigeria. Presentation entails descriptive analysis of variables included in the model, variance inflation factor, correlation analysis, pooled OLS regression analysis, fixed effect panel analysis (cross sectional and period specific effect), random effect panel analysis, post estimation test and discussion of major findings.

Descriptive Analysis of Variables

Table 1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROE	80	.823	.960	.032	3.67
MPR	80	11.262	2.408	6.0	14.0
LDR	80	16.037	2.002	11.4	19.6
LIQ	80	44.732	11.917	29.931	64.1
CRR	80	13.841	7.876	4.2	28.45
MOS	80	22595.04	12874.09	3594.3	48500.1
FSI	80	20.866	3.332	12.23	27.89

Sources: Author’s Computation, (2022)

Descriptive statistics reported in table 1 revealed that the mean return on equity, monetary policy rate, liquidity rate, lending rate, cash reserve ratio, money supply and firm size for 2006-2021 across five deposit money banks sampled in the study stood at: .823 percent, 11.262 percent, 16.037 percent, 44.732 percent, 13.841 percent, 22595.04 billion naira and 20.866 billion naira respectively. Reported minimum and maximum values stood at:

.032 and 3.67 for return on equity, 6.0 percent and 14.0 percent for monetary policy rate, 11.4 percent and 19.6 percent for lending rate, 29.93 and 64.1 percent for liquidity ratio, 4.2 percent and 28.45 percent for cash reserve ratio, 3594.3 billion naira and 48500 billion naira for money supply and 12.23 billion naira and 27.89 billion naira respectively.

Correlation Analysis

Table 2 Correlation Matrix

	ROE	MPR	LDR	LIQ	CRR	MOS	FSI
ROE	1.0000						
MPR	0.1305	1.0000					
LDR	-0.2272	-0.1804	1.0000				
LIQ	-0.2500	-0.5563	0.5211	1.0000			
CRR	0.2624	0.5398	-0.6889	-0.8302	1.0000		
MOS	0.2734	0.5506	-0.6286	-0.9021	0.9309	1.0000	
FSI	0.2231	0.4966	-0.3052	-0.5954	0.5051	0.6669	1.0000

Sources: Author’s Computation, (2022)

Table 2 evidenced correlation between variables used in the study. As presented in table 2, it can be observed that there is mixed correlation between pairs of variables. Result showed positive correlation between pairs of variables except for return on equity and lending rate, return on equity and liquidity ratio with respective specific correlation coefficient of -0.2272 and -0.2500. However, positive correlation is obtained for return on equity and monetary policy rate, return on equity and cash reserve ratio, return on equity and money supply, return on equity and firm size with specific correlation estimate of 0.1305, 0.2624, 0.2734 and 0.2231 for the respective pairs.

Observably, result reflects that the correlations between pairs of variables are relatively strong.

Multicollinearity Test

The presence of strongly correlated variables in a model tends to create a multicollinearity problem. Therefore, the Variance Inflation Factor (VIF) test can be used to confirm the existence of multicollinearity among the independent variables. Based on the rule of thumb, the VIF must be less than 10 to confirm that the estimates of the regression would not be biased due to the presence of multicollinearity.

Table 3 Result of Multicollinearity Test

Variable	VIF
MOS	18.27
CRR	11.21
LIQ	5.64
FSI	2.40
LDR	2.13
MPR	1.78
Mean VIF = 6.91	

Sources: Author's Computation, (2022)

Table 3 shows that all the variables have a VIF value of less than 10, thus implying that there is no strong evidence of collinearity among the independent variables.

This section presents analysis of the effect of monetary policy rate, liquidity rate, lending rate and cash reserve ratio on performance of deposit money banks in Nigeria measured in terms of total amount of dividend paid. The study made use of panel data analysis including pooled OLS estimation, fixed effect estimation, and random effect estimation. Estimation results are presented in tables below and interpreted accordingly.

Analysis of the Effect of Monetary Policy Rate, Liquidity Rate, Lending Rate and Cash Reserve Ratio on Performance of Deposit Money Banks in Nigeria

Pooled OLS Estimation

Table 4: Pooled OLS Parameter Estimates

Series: ROEMPR LDR LIQ CRR MOS FSI

Variable	Coefficient	Probability
C	.9917	0.047
MPR	-.0160	0.088
LDR	-0.0431	0.083
LIQ	-.0050	0.013
CRR	.0134	0.070
MOS	-2.523	0.094
FSI	.0359	0.074

R-square = 0.9431

Adjusted R-square = 0.6116

F-statistics = 1.15

Prob(F-stat) = 0.0400

Pooled OLS panel estimation demonstrated in table 4 reported coefficient estimate of -.0160, -0.0431, -.0050, .0134, -2.523, .0359 for monetary policy rate, liquidity rate,

lending rate, cash reserve ratio, money supply and firm size with probability values of 0.088, 0.083, 0.013, 0.070, 0.094 and 0.074. The result showed that monetary policy rate exerts negative

insignificant effect on return on equity of the sampled banks, lending rate exerts insignificant negative effect on return on equity, liquidity ratio effected negatively and significantly return on equity; similarly, money supply exerts negative insignificant effect on return on equity while cash reserve ratio and firm size affects return on equity positively and insignificantly. R-square value reported in table 4.4 revealed that about 61% of the systematic variation in performance of selected

deposit money banks measured with return on equity can be explained by monetary policy rate, liquidity rate, lending rate, cash reserve ratio, money supply and firm size. Reported f-statistics of 1.15 and the probability value of 0.0400 validates the fact that all the explanatory variables of monetary policy jointly influence the performance of deposit money banks sampled in the study.

Fixed Effect Panel Analysis

Table 5 Fixed Effects Estimates (Cross Sectional and Period Specific)

CROSS-SECTIONAL SPECIFIC EFFECT			TIME SPECIFIC EFFECT		
Variables	Coefficients	Prob	Variables	Coefficients	Prob
C	1.2756	0.058	C	4.6490	0.799
MPR	.0007	0.065	MPR	.1011	0.070
LDR	-.4557	0.030	LDR	-.2325	0.025
LIQ	-.0029	0.007	LIQ	-.0161	0.095
CRR	-.0066	0.045	CRR	-.0982	0.004
MOS	.0001	0.013	MOS	.0001	0.061
FSI	-.01368	0.058	FSI	.03784	0.015
R-square=0.9401			R-square=0.9811		
Adjusted R-square=0.9314			Adjusted R-square=0.8951		
F-statistics=18.24			F-statistics=12.39		
Prob(F-stat)= 0.0000			Prob(F-stat)= 0.0811		

Sources: Author’s Computation, (2022)

Table 5 presents results of the fixed effect estimation (cross-sectional and time specific effect). Notably result presented in table 4.5 showed that when cross sectional effect is incorporated into the model the effect of monetary policy rate on return on equity is positive and insignificant with coefficient estimate of .0007 ($p=0.065>0.05$), effect of lending rate on return on equity is negative and significant with coefficient estimate of $-.4557$ ($p=0.030<0.05$). Again, liquidity ratio exerts negative significant effect on return on equity with coefficient estimate put at $-.0029$ ($p=0.007<0.05$), cash reserve ratio affects return on equity of DMBs negatively and significantly with coefficient estimate of $-.0066$ ($p=0.045<0.05$). However, money supply turned negative and significant while firm size exerted negative insignificant effect on return on equity of DMBs with coefficient estimates of .0001 ($p=0.013<0.05$) and $-.0136$ ($p=0.058=0.05$) respectively.

On another hand, when period specific effect was incorporated into the model, explanatory variables including monetary policy rate exerts

positive insignificant effect on return on equity .1011 ($p=0.070>0.05$), lending rate exerts negative significant effect on return on equity $-.2325$ ($p=0.025<0.05$), liquidity ratio affects return on equity negatively and insignificantly with coefficient estimate of $-.0161$ ($p=0.095>0.05$), cash reserve ratio affects return on equity negatively and significantly with coefficient estimate of $-.0982$ ($p=0.004<0.05$) while money supply exerts positive insignificant effect, firm size exerts positive significant effect on return on equity of sampled with coefficient estimates of .0001 ($p=0.061>0.05$) and .0378 ($p=0.015<0.05$). Reported R-square values stood at 0.93 for cross section specific estimation and 0.89 for period specific estimation, reflecting that about 93% of the systematic variation in return on equity is determined by monetary policy rate, liquidity rate, lending rate, cash reserve ratio, money supply and firm size when heterogeneity effect across firms is incorporated into the model, while 89% of the systematic variation can be explained when period heterogeneity effect is incorporated into the model.

4.4.3 Random Effect Analysis

Table 6 Random Effect Estimation
 Series: ROEMPR LDR LIQ CRR MOS FSI

Variable	Coefficient	Probability
C	1.6101	0.043
MPR	.0005	0.073
LDR	-.0455	0.026
LIQ	-.0029	0.001
CRR	-.0065	0.051
MOS	.0001	0.009
FSI	-.0133	.066

R-square=0.7461

Wald chi-square = 93.87

Prob> chi-square = 0.0000

Table 6 presents the random effect estimates. Result showed that the effect of monetary policy rate on return on equity is positive and insignificant when heterogeneity effect is incorporated into the error term of the model, lending rate exerts negative significant effect on performance of DMBs. Meanwhile, liquidity ratio exerts negative and significant effect on return on equity while cash reserve ratio exerts negative insignificant effect on return on equity of DMBs. Also, effect of money supply on return on equity when heterogeneity is incorporated into the error term is positive and significant. Furthermore, firm size affects return on equity negative although insignificantly. Specifically, coefficient estimates

reported for monetary policy rate, liquidity rate, lending rate, cash reserve ratio, money supply and firm size stood at .0005, -.0455, -.0029, -.0065, .0001 and -.0133 with probability values of 0.073, 0.026, 0.001, 0.051, 0.009 and 0.066 respectively. R-square statistics reported in table 4.6 stood at about 0.94 which connote that about 74% of the systematic variation in performance of deposit money banks captured with return on equity in the study can be explained jointly by variation in monetary policy rate, liquidity rate, lending rate, cash reserve ratio, money supply and firm size, incorporating heterogeneity effect across firms over time into the error term.

Post Estimation Tests

Table 7 Restricted F Test of Heterogeneity (Cross-Sectional and Time Specific)

	F-statistics	Probability
Cross sectional	25.65	0.0000
Time specific	0.02	0.1000

Source: Author's Computation, (2022)

Table 7 reveals result of the heterogeneity test conducted with respects to both cross-sectional and period specific effect. Reported in table 7 are f-statistics values of 25.65 and 0.02 with probability values of 0.0000 and 0.1000 for cross sectional and period specific effect respectively. Hence the table revealed that there is enough evidence to reject the null hypothesis that all differential intercept corresponding to the cross-sectional specific units

are equal to zero, but otherwise for the period specific intercepts. Therefore, it can be concluded that there is only cross-sectional heterogeneity/uniqueness effect among the selected deposit money banks. Thus, pooled OLS estimator restriction is not valid as cross-sectional heterogeneity effect is too significant to be ignored.

Hausman Test

Table 8 Hausman Test

Null hypothesis	Chi-square stat	Probability
Difference in coefficient not systematic	0.02	0.0182

Source: Author's Computation, (2022)

Table 8 reveals a chi-square value of 0.02 alongside a probability value of 0.0182. The result

shows that there is enough evidence to reject the null hypothesis that differences in coefficients of

fixed effect estimator and random effect estimation is not systematic. Therefore, given the fact the difference between fixed effect estimates and random effect estimates is significant, the most consistent and efficient estimation for the

investigation conducted in the study is the fixed effect cross section or firm specific estimate presented in table 5 above.

Table 9 Other Post Estimation Test

Wald test		
Null hypothesis	Statistics	Probability
Panel homoscedasticity	93.87	0.0000
Pesaran test		
Null hypothesis	Statistics	Probability
No cross-sectional dependence	8.53	0.0035
Breusch-Pagan Lagrange Multiplier test		
Null hypothesis	Statistics	Probability
Panel Normality	2.04	0.0413

Source: Author's Computation (2022)

Table 9 reported result of post estimation test conducted to confirm if the specified model is in turn with basic assumptions underlining the panel estimation conducted in the study. The result showed that there is no evidence to reject the null hypothesis on panel homoscedasticity and null hypothesis of no cross-sectional dependence and accept the hypothesis of panel normality. Hence, the established result of post estimation test reported in table 9 validates assumptions of equal variance of residual terms, cross sectional independence and normality of the model. Which reflect that the model is fit for inferential analysis.

V. DISCUSSION OF FINDINGS

The most obtainable and accurate estimation carried out in this study demonstrated in table 4.6 revealed that monetary policy rate exerts positive insignificant effect on return on equity of deposit money banks in Nigeria. This implies that as monetary policy rate increases ownership shoots up, performance of deposit money banks tends to be on the increase; the monetary policy rate is undoubtedly the baseline interest rate harnessed by the Apex Bank to moderate macroeconomic variables and basically put exchange rate, inflation rate which significantly influences interest rates. Monetary policy rate directly affects influences inflation rate amongst other macroeconomic factors thus giving banks a clear tendency for growth as prices of goods and services begin to cascade thereby increasing average capital utilisation of businesses increases despite relatively increasing competition in the business environment which influences borrowing and causes increased interest

revenue for DMBs. Also, interest rates for savers tend to maintain steady increase and investment is highly encouraged due to increased disposable income; these which requires the intermediation of banks boosts their inflow which ultimately consolidates profitability and guarantees sustainable return on equity.

Again, results obtained indicated that lending rate affects return on equity negatively and significantly thus implying that as lending rate falls, performance of DMBs heightens. Lending interest can either be an income when paid by customers and it could also an expense when customers default on loan repayment. Increasing interest rate is proven to be a precursor to increasing loan default as corporate businesses existing in a volatile economy that exists in Nigeria are faced with fluctuating business performance which threatens the performance of businesses existing in the country and consequently hindering businesses from repaying their loans. In effect, DMBs limits loan provision towards controlling increasing loan default rate; this would noticeably influence performance of banks as interest income particularly on loan forms the major source of revenue for the bank. This which suggests poor financial deepening and depth consequently disturbs growth in every sectors especially the informal sector as loans may become inaccessible thereby occasioning poor performance for businesses and limits savings which further constrains banks performance.

Furthermore, estimation results evidences that liquidity rate exerts negative significant effect on performance of deposit money banks in Nigeria

thus suggesting that as liquidity rate falls, performance of DMBs increases. The basic business of deposit money banks requires that adequate liquid assets is maintained towards ensuring that banks meet their short-term obligations to depositors and also mobilize funds on a consistent basis to the deficit unit of the economy. In carrying out these basic functions which is made effectual if adequate liquid assets, DMBs revenue increases and their profit earning ability also maintains the same trend; although most banks have their funds deposited with the Central Bank; also the Apex Bank sets limit for liquid assets to be maintained by DMBs thus causing banks to withhold liquid assets or deposit with sister institutions instead of exploring investments amongst other services which could generate additional investment income for the bank which augments inflow from other sources and ultimately cause the bank to post relatively high profit and ensure continuous return on equity.

Lastly, results showed that cash reserve ratio exerts negative significant effect on return on equity of deposit money banks in Nigeria which implies that as cash reserves ratio set by the CBN falls, banks performance tends to increase. The business of banking requires availability of adequate cash to consistently meet short term obligation to depositors as they find need for their money per time; although as directed such cash are either kept with other banks or the apex bank so that they are not used for another course which may trigger illiquidity for banks and constrain them from observing their short-term obligations. The implication of this is ineffectual business operation which drags down interest income and reduce earnings potentials of banks thereby impeding optimal performance.

VI. CONCLUSION AND RECOMMENDATIONS

The study assessed the effect of monetary policy on the performance of deposit money banks in Nigeria. The study specifically examined effect of monetary policy rate on performance of deposit money banks in Nigeria; determined the effect of liquidity rate on performance of deposit money banks in Nigeria; ascertained the effect lending rate on performance of deposit money banks in Nigeria and evaluated the relationship between cash reserve ratio and performance of deposit money banks in Nigeria. Secondary panel data covering 2006-2021 was sourced from the financial reports of five deposit money banks sampled in the study. Preliminary analysis including descriptive statistics and variance inflation factor were conducted;

again, panel data estimation techniques such as pooled OLS panel analysis, fixed effect and random effect panel analysis followed by post estimation tests were employed in analyzing data collated in the study. Results of analysis conducted in the study reveal that:

- i. monetary policy rate on return on equity is positive and insignificant with coefficient estimate of .0007 ($p=0.065>0.05$);
- ii. lending rate exerts negative significant effect on return on equity of deposit money banks in coefficient estimate of -0.4557 ($p=0.030<0.05$);
- iii. liquidity ratio exerts negative significant effect on return on equity with coefficient estimate put at -0.0029 ($p=0.007<0.05$); and
- iv. cash reserve ratio affects return on equity of DMBs negatively and significantly with coefficient estimate of -0.0066 ($p=0.045<0.05$).

Conclusion

Premise upon the results obtained in this study, it is evident that monetary policy has an association with performance of deposit money banks in Nigeria. Specifically, the study established that monetary policy rate exerts positive insignificant effect on return on equity of deposit money banks in Nigeria; lending rate affects return on equity of deposit money banks negatively and significantly; liquidity rate exerts negative significant effect on performance of deposit money banks in Nigeria and cash reserve ratio exerts negative significant effect on return on equity of deposit money banks in Nigeria. Hence, this study established that monetary policy exerts noticeable effect on the performance of deposit money banks in Nigeria.

Recommendations

Based on these findings, it is thereby urgent that the Central Bank of Nigeria should consistently moderate monetary policy rates to make them highly attractive towards guaranteeing optimally sustainable performance of banks as well as ensure that adequate monitoring of DMBs liquidity is ensured to aid bank's ability to mobilize credit and boost profitability. The lending rate should be made affordable by the CBN to reduce loan default rate, which consequently guarantees improved performance for DMBs. Credit reserves should also be adequately monitored by the CBN to match with the variations in the macro economy as it affects the performance of DMBs in Nigeria.

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