EFFECT OF MONETARY POLICY ON THE PROFITABILITY OF COMMERCIAL BANKS IN NIGERIA.

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ABSTRACT
The continuous decline in the profitability of Commercial Banks in Nigeria has become a source of great concern. Commercial Bank's profitability has continued to decrease with many banks becoming bankrupt. This study evaluates Effect of Monetary Policy Variables on the profitability of Commercial Banks in Nigeria. The study utilized the Ex-post facto research design. The research employed secondary data, which were obtained from the annual financial statement and reports for a 10-year period (2014–2023). The Panel regression model was employed to test the effect of monetary policy variables on the profitability of Commercial Banks in Nigeria. The result shows that Open Market Operation (OMO) have no significant effect on Return on Assets (ROE). Furthermore, it revealed that Cash Reserve Ratio (CRR) have a significant effect on the Return on Equity (ROE). The study concluded that Open Market Operations (OMO) did not exhibit statistically significant effects, in contrast, the Cash Reserve Ratio (CRR) emerged as a statistically significant determinant of the dependent variable. The Study then recommends among others that the Central Bank of Nigeria (CBN) could strategically leverage CRR adjustments as a key tool to manage the dependent variable.

Keywords; Profitability, Return on Equity, Open Market Operation, Cash Reserve Ratio and Central Bank of Nigeria.

1.0 Introduction

Profitability of an organization is one of the major contributions of economic development of a nation by providing additional employment and tax revenue to the government. Moreover, it will contribute to the income of investors by having a higher dividend, and thereby improve the standard of living of the people. In order to make profit for instance, commercial banks invest customers' deposits in various short term and long-term investment outlets, however, core of such deposits are used for loans. Hence, the more loans and advances extend to borrowers, the more the profit they make (Atoi, 2019).

The profitability indices of banks in developed countries are generally higher than those in emerging markets like Nigeria which decline from 2.4% to 2.26% in the year 2014 to 2015 and 2.23% in 2016, meanwhile from 2017 to 2018, there was a little increase from 2.49% to 2.54% and decline in the year 2019 to 2.5%, 1.32% in the year 2021. From 2022 to 2023 return on equity of commercial banks in Nigeria, increases from 1.32% to 3.18%. Profitability indices in developed countries have typically report figures above 1.41% (NDIC 2023). For example, U.S. banks have consistently achieved ROE rates around 1.57% to 1.85% and in Europe from 10% to 15% (IMF2023). This is attributed to low inflation rates, stability in currency and more stable regulatory environment that fosters profitability. The banking sector is heavily regulated, with frequent changes in policies that can affect profitability. For example, directive from the Central Bank of Nigeria (CBN) regarding interest rates and capital requirement can constrain banks' ability to maximise profit (Ali and Shadrach, 2023). Return on equity of Nigeria commercial banks has shown a declining trend from 3.75% to 3.47% in the year 2014 to 2021 and improving trend from 2021 to 2023, increasing from 3,47% to 9.38% as at June 2023 (NDIC 2023). However, Nigerian banks still lag behind developed countries in terms of ROE due to challenges like high inflation, currency volatility and regulatory constraints (CBN, 2024).

In conducting Open market operation, the Research Department of Central Bank of Nigeria (CBN) advises the trading desk of the Banking Operations Department of the CBN, on the level of excess or shortfall in bank reserves. Thereafter, the trading desk decides on the type, rate and tenor of the securities to be offered and notifies the discount houses 48 hours ahead of the bid date. The highest bid price (lowest discount rate quoted) for sales and the lowest price offered (highest discount offer) for purchases, with the desired size or volume, is then accepted by the CBN (Nnanna, 2010).

Open market operation is mainly conducted in the secondary market for government securities. Banks subscribing to the offer draw on their reserves balances at the CBN thereby reducing the overall liquidity level of the banking system. Thus, if an expansionary monetary policy is being pursued, the Central Bank purchases government securities from the commercial banks, which causes their reserves to rise and hence increase their credit creation ability (Okafor, 2019).

Similarly, in conducting a contractionary monetary policy, the Central Bank sells government securities to commercial banks. This will cause their reserves to fall thereby limiting their credit creation abilities. Three types of transactions are carried out in open market operations, namely;

i. Outright sales or purchase of securities in the market,
ii. Repurchase transactions (REPOS) involving the purchase or sales of securities with the obligation to reverse the transaction on an agreed date,
iii. Matched sales purchase transaction, which as the name implies, is a simultaneous sales and purchase of securities for delivery at a future date.

Mbachu (2022) and Ebulison (2020) assert that open market operation has been recognised as one of the Monetary Policy instruments that may influences return on equity of commercial banks. It was revealed that there is a link between open market operation and return on equity of commercial banks (Philemon and Alex, 2022). Commercial banks use open market operation to generate fund in form of commission generated by selling of treasury bills and treasury certificate among others. Robert, *et'al* (2020) augured that open market operation is an instrument used to control inflation and volume of money in circulation. It is on this note that this current study

employs open market operation as one of its independent variables to see weather profitability of commercial banks could be affected through open market operation.

In the study of Catherine (2019); Charity, *et'al* (2021) pointed out that, cash reserve ratio affects the volume of bank transactions in terms of loans and advances and profitability. The higher the cash reserve ratio the lower the capability of commercial banks to issue out loan and that will affect their profitability. As stated by Charity, *et'al* (2021) cash reserve ratio have not been fully defined and understood by commercial banks. Clear definition of cash reserve ratio is relevant to commercial banks, which might cause them to have financial strength in terms of liquidation and confidence by their customers. It has been noted that cash reserve ratio is one of the tools of monetary policy used to control money supply to the commercial banks. Umar, Iliya, Nazeef and Rabiu (2022) stated that any changes made in CRR affects the availability of money with the bank for credit in the system thereby influencing the money supply in the economy. The established relationship between cash reserve ratio and profitability as stated by the above researchers is the motive of this current study. In other word, this current study is moved to investigate the effect of cash reserve ratio on the profitability of commercial banks in Nigeria.

However, despite this important consideration studies especially in Nigeria did not devote much attention to this study of effect of monetary policy variables on the return on equity of commercial banks. There are generally a handful of studies on the effect of monetary policy variables on the return on equity of commercial banks: Oyakhiromhe and Ezu (2024) carried out a study on the effect of monetary policy rate on the performance of selected quoted deposit money banks in Nigeria, the researchers used panel data of five banks over 2006-2021, using return on asset as performance measure, liquidity and lending rate as measure for monetary policy, ordinary least squire regression technique was used to analyzed the data ; Owoeye *et al* (2023) conducted a survey on effect of monetary policy on deposit liabilities of commercial banks in Nigeria, the study used time series data, focusing on return on asset, interest rate and cash, reserve ratio autoregressive distribution lag was used to analysed data; Adam and Ayagi (2024) examined the relationship between liquidity on profitability of listed deposit money banks in Nigeria. The study covered a period of 10 years from 2013 to 2022. The study employed Stata V14.2 and the estimation techniques are OLS ordinary least square and the data obtained were analyzed using descriptive statistics, multiple regression and correlation co-efficient. The study adopts return on asset, return on equity as dependent variable for profitability and current asset, cash ratio and free cash flow as the independent variables for liquidity with leverage and company size as the control variables; (Olofin, *et al* 2024) investigate the impact of liquidity risk on return on equity of listed deposit money banks in Nigeria. Panel data on cash reserve ratio, liquidity ratio, loan to deposit ratio, and return on equity were collected from the annual reports and financial statements of the five systemic banks listed on Nigerian Exchange Group from 2008-2023. Ordinary least square regression was employed to analyze the data.

Furthermore, in trying to address the fluctuation of return on equity, effect of monetary policy variables was studied to test the relationship. Some of the variables to be used are: open market operation and cash reserve ratio. However, most of the studies are on either the impact of monetary policy or impact of liquidity on the return on equity. This study investigates the effect of monetary policy variables on the return on equity of commercial banks in Nigeria.

2.0 Literature Review and Theoretical Foundation

2.1 Profitability

Profitability of commercial banks has been a subject of interest for many years, basically, in the finance literature. Profitability is said to be an inflection of two words profit and ability. In other words, it referred to Earning power of operating efficiency of the concerned investment (Atoi, 2019). The concept of profitability can be described as the ability of a given investment to earn a return from its use (Ebulison, 2020). According to Okere, *et'al* (2021) profitability is the ability to make profit from all the business activities of an organization, company, firm, or an enterprise. It shows how efficiently the management can make profit by using all the resources available in the market.

Evaluating banks' profitability allows the financial report users, both internal and external, to judge the result of the business strategy and activity in objective monetary terms. Ogechukwu, and Chidi (2023) argued that profitability helps in short term and long term forecasting and growth and can be identified with the help of financial ratios such as asset utilization or efficiency ratios, deposit mobilization, loan performance, liquidity ratio, leverage or financial efficiency ratios, profitability ratios, solvency ratios and coverage ratios can be used to evaluate bank profitability.

In view of the foregoing, profitability as the financial outcome of managerial decisions, highlighting its importance in cost management and strategic planning to minimize cost and maximize returns. In fact, profitability as the financial benefit realized when revenues exceed the costs and expenses incurred in operating a business. It serves as a primary indicator of managerial effectiveness. Solomon, Solomon and Norton (2018) describe profitability as the net outcome of a company's operations, reflecting its financial success and sustainability. They argue that profitability is a key driver of business expansion and investor confidence. In his conclusion, Kieso, Weygandt and Warfield (2020) define profitability as the ability of a business to generate earnings that sustain its operations, meet shareholder expectations, and support reinvestment for future growth.

Flowing from the above explanations of the concept of profitability in this study can be defined as measures that determine bank's ability to generate earnings from shareholders' equity. In other word it reflects how efficiently management utilizes equity capital to generate profits.

2.2 Return on Equity

Return on equity (ROE) is a key financial ratio that measures a company's profitability relative to shareholders' equity. It indicates how efficiently a company utilizes its equity to generate profits for its investors. Different researchers and scholars have defined ROE from various perspectives, including finance, accounting, and investment management. Brigham and Ehrhardt (2019) define return on equity (ROE) as the ratio of net income to shareholders' equity, reflecting the efficiency with which a firm converts equity investments into profits. ROE measures a firm's ability to generate earnings from its equity capital, serving as an important metric for investors assessing profitability.

According to Abeysinghe and Basnayake, (2016), return on equity (ROE) is defined as a financial ratio that shows how much profit a company earned compared to the total number of shareholder equity invested or recorded on the balance sheet. A business entity with high ROE is likely to generate cash internally. Thus, the higher the ROE the better the company is in terms of profit generation. ROE represents the rate of return earned on the funds invested in the bank by its

stockholders. Damodaran (2012) define return on equity as the key determinant of firm value, showing the profitability of shareholders' equity and indicating how well management is using investor funds to generate returns."

Furthermore, Gitman and Zutter (2015) posited that ROE can be conceptualized as a key indicator of corporate profitability, calculated as net income divided by total shareholders' equity. It represents how well a company converts investors' capital into profits. Penman (2013) also conceptualizes ROE as a key financial metric reflecting the return that shareholders receive on their equity investment, considering both operational efficiency and capital structure. Pandey (2021) explained ROE as a measure of financial efficiency that indicates the percentage return on shareholders' funds. It helps investors assess a company's ability to generate returns compared to alternative investments. According to Ross, Westerfield and Jaffe (2022) return on equity (ROE) is define as a profitability ratio that measures a company's ability to generate earnings from shareholders' equity. It reflects how efficiently management utilizes equity capital to generate profits.

For the purpose of this study, return on equity as define by Ross, Westerfield and Jaffe was used as the operational definition because they are authorities in the field of behavioral finance, and it encompasses the ingredients that constitute return on equity. As suggested by Brigham and Ehrhardt (2019) defined ROE as an essential measure of financial performance, indicating the rate of return earned by shareholders on their investment. A higher ROE suggests effective use of equity, while a declining ROE may signal financial inefficiencies. Looking at the previous definitions given by scholars in the field of behavioral finance, this study therefore, adopts the definition of return on equity as define by Gitman and Zutter (2015).

2.3 Open Market Operation

In Nigeria, Open Market Operations was introduced into the money market in June, 1993. Open Market Operations (OMO) can be defined as the sale or purchase of government or other eligible securities thereby altering the reserve base of banks and their credit creating capacities, aggregate demand and the general level of economic activity (Dan, 2013). According to Black (2017) OMO is the purchase or sale of securities by the Central Bank as a means of changing interest rate and money supply. Nnanna (2010) define OMO as the sale or purchase of eligible bills or securities in the open market by the Central Bank of Nigeria for the purpose of influencing deposit money banks' reserves balances, the level of base money and consequently the overall level of monetary and financial conditions. It is based on the discretionary power of the Central Bank to buy from or sell government securities or instruments in the money market, to the bank and non–bank public, in order to achieve macroeconomic objectives. These eligible instruments include treasury bills, treasury certificates and development stocks of not more than three years' maturity period. OMO is mainly conducted in the secondary market for government securities. Banks subscribing to the offer draw on their reserves balances at the CBN thereby reducing the overall liquidity level of the banking system. Thus, if an expansionary monetary policy is being pursued, the Central Bank purchases government securities from the commercial banks, which causes their reserves to rise and hence increase their credit creation ability (Okafor, 2019).

Similarly, in conducting a contractionary monetary policy, the Central Bank sells government securities to commercial banks. This will cause their reserves to fall thereby limiting their credit creation abilities. Three types of transactions are carried out in open market operations, namely;

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For the purpose of this study, open market operation as defined by Nnanna was used as the operational definition because the researcher is an authority in the field of behavioral finance, and it encompasses the actual meaning of open market operation. Considering the previous definitions given by scholars in the field of behavioural finance, this study therefore, adopt the definition of open market operation as defined by (Dan, 2013; Black, 2017) because incorporates the components that constitute open market operation.

2.4 Cash Reserve Ratio

Bawa (2018) defined cash reserve ratio as the funds that commercial banks set aside with the apex bank for use in emergencies. Cash reserve ratio is the specified minimum rate of the total deposits that commercial banks have to reserve for financial stability. The funds are saved to ensure that banks do not become insolvent to meet the demands of their customers. Cash reserve ratio determines the capital level maintained by banks in proportion to their assets (Mitku, 2018). Cash reserve ratio, also called reserve requirement, is the central bank standard employed by most of the world's apex banks. Therefore, the required cash reserves ratio is typically in form of cash stored in the bank vault or deposited with the apex bank. Cash reserve ratio is a monetary tool that affects the volume of banks transaction in terms of loans and advances and profitability.

Furthermore, Catherine (2019) posit that the reserve requirement can be manipulated by the central bank to reduce the ability of commercial banks to make loans to the public by simply increasing the ratio or enhancing their lending position by decrease in the ratio. A change in the required reserve ratio changes the ratio by which the banking system can expand deposit through the multiplier effect. If the required reserve ratio increases, the multiplier decreases and thereby reduces the liquidity position of the banking.

For the purpose of this study, cash reserve ratio as define by Mitku was used as the operational definition because the researcher is an authority in the field of behavioral finance, and it encompasses the ingredients that constitute cash reserve ratio. Looking at various definition and explanation of cash reserve ratio by different authors, the definition of cash reserve ratio as defined by (Bawa, 2018) was adopted because, it constitutes the main aim of cash reserve ratio.

2.5.0 Empirical Review

2.5.1 Open Market Operation and the Profitability of Commercial Banks.

Shirya, Njoka and Abdul (2023) carried out a study on Relationship between Monetary Policy Instruments and Financial Performance of Commercial Banks in Nigeria. The study was anchored on Keynesian theory and employed causal research design. The Nigerian banking populace is 21 commercial banks, so census approach was adopted. Panel data was utilized and inferential statistical methods were used to analyse the data. The results show that monetary policy reforms had positively and significantly intervened on the relationship between open market operations and financial performance of commercial banks in Nigeria of a most distinctive finding of the study. However, the study did not

give a clear understanding of how OMOs specifically influence the return on equity (ROE) of these banks. ROE is a critical measure of financial performance, reflecting the profitability relative to shareholders' equity.

Robert, Dickson, Peter and Peter (2020) conducted a study on Monetary Policy and Profitability of Commercial Banks in Uganda. The study adopts a causal relationship research design. Data, covering 9 years from 2010-2018, was collected from all the registered commercial banks which were in operation over the study period. Various monetary policy variables such as; treasury bill rate, interbank rate, and weighted average lending rate were included in the empirical model as predictor variables. Return on Assets is used as a measure of bank profitability. A dynamic two-step System Generalized Method of Moments panel estimator is applied to estimate the empirical model. Findings: Estimates show that monetary policy in terms of its link to the lending rate has a significant causal effect on Return on Assets, suggesting that interest rate changes predict bank profitability of commercial banks in Uganda. The 91-day Treasury bill rate and money supply were insignificant in predicting bank profitability. However, an understanding of how specific monetary policy tools, particularly open market operations (OMOs), influence the return on equity (ROE) of commercial banks should be clearly stated.

Philemon and Alex (2022) carried out a study on Effects of selected Monetary Policies on Loans Portfolio Performance among Commercial Banks in Kenya. This study adopted a descriptive survey design and employed census in the selection of respondents. The study used questionnaires to gather primary data from the respondents and secondary data sheet to collect secondary data. The statistical package for social sciences (SPSS) version 20 was used to generate both descriptive and inferential statistics. Analysis of data was done using descriptive statistics specifically mean, standard deviation, percentages and frequencies. Also, multiple regression was also done in order to establish the nature of the relationship between open market operations, central bank rate, minimum reserve requirements and Kenya bankers' reference rate. The findings of the study showed that there was no significant relationship between open market operations, central bank rate, Kenya bankers' reference rate and loans portfolio performance. While the study provides valuable insights into how OMOs affect loan portfolios, it does not specifically address the effect of OMOs on the Return on Equity (ROE) of commercial banks.

Ebulison (2020) conducted a study on Monetary Policy and Commercial Banks Assets Quality in Nigeria: Panel Data Analysis from 2009 to 2018. Cross sectional data were sourced from annual reports of commercial banks and Central Bank of Nigeria Statistical Bulletin. Assets quality indicator of commercial banks soundness was used as proxies for the dependent variables while cash reserve ratios, open market operation rates, monetary policy rates, treasury bills rates and money supply were used as proxies for the independent variables. Panel data methodology was employed while the fixed effects model was used as estimation technique at 5% level of significance. Findings of the study proved that cash reserve ratio, open market operations rates, monetary policy rates and treasury bills rates have no significant relationship with assets quality indicators of commercial banks in Nigeria. However, Money supply has significant relationship with assets quality indicators of commercial bank soundness in Nigeria. However, the study did not specifically explore the effect of open market operations (OMOs) on the return on equity (ROE) of commercial banks. The exploration of such variable could have provided a more comprehensive understanding of the dynamics at play.

2.5.2 Cash Reserve Ratio and the Profitability of Commercial Banks

Umar, Iliya, Nazeef and Rabiu (2022) conducted a study on the Effect of Monetary Policy on the Performance of Deposit Money Banks in Nigeria. This research was based on secondary source of data extracted out from Central Bank of Nigeria (CBN) statistical bulletin and Index mundi. The Autoregressive Distributed Lag (ARDL) approach to cointegration was applied to achieve the objective. The empirical results revealed that both in the long run and short run, bank lending rate (BLR) has been found to have a significant positive impact on banks loans and advances (BLA), This means that (BLR) has significant positive impact on the performance of deposit money banks in Nigeria. While liquidity rate (LR) has significant impact in the long run but has no significant impact in the short run likewise interest rate (IR) 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. While the study provides valuable insights into how certain monetary policy instruments affect the performance of DMBs in Nigeria, it does not specifically address the effect of Cash Reserve Ratio (CRR) on the Return on Equity (ROE) of commercial banks when compare its findings to research focusing on the direct effect of CRR on ROE.

Abhishek and Ankur (2024) investigate the Impact of Capital Adequacy Ratio on the Profitability of Commercial Banks in India. The secondary data have been utilized for the purposes of the study. Capital adequacy was the independent variable and the profitability of commercial banks is the dependent variable for the study. The return on assets and return on equity and net interest margin are the proxies for the profitability. The information was gathered from the audited financial reports available at money control.com and investing.com for selected largest 16 banks between 2017-2018 and 2022-2023. The Linear Regression model was also used for the analysis of data. The results of the study revealed that capital adequacy ratio significantly predict return on assets, return on equity and net interest margin. An increase in the capital adequacy ratio leads to an increase in the return on assets, return on equity and net interest margin. An increase in return on assets, return on equity and net interest margin are reflected in an increase in the profitability of banks. The study focuses on Indian commercial banks, examining factors such as the Capital Adequacy Ratio (CAR) and its effect on profitability metrics like ROE. There is inadequate comparative studies that analyze how specific monetary policy tools, such as the CRR, affect the ROE of commercial banks across different countries with varying regulatory and economic environments.

Adelegan and Idolor (2024) carried out a study on the impact of liquidity management on financial performance of deposit money bank in Nigeria using time series data from 2011 to 2020. The study analyses the data with the aid of E-view statistical package for descriptive and correlation analysis and STATA 11 after testing for the best estimator from pool OLS, fixed effect and random effect estimator based on Breusch and Pagan LM test, F-test and Hausman test. Deposit to asset ratio has negative but statistically insignificant relationship with returns on assets of DMBs. Cash reserve ratio has positive but statistically insignificant relationship with returns on equity of DMBs in Nigeria. Loan deposit ratio has negative but statistically insignificant relationship with net interest margin of deposit banks in Nigeria. The study failed to consider other

potentially relevant factors that may influence the relationship between liquidity management and financial performance such as macro-economic condition, regulatory environment or investor sentiment. The inclusion of such variables could have provided a more comprehensive understanding of the dynamics in play.

Oluyomi and Joseph (2024) did a study on the impact of liquidity management on financial performance of deposit money bank in Nigeria using time series data from 2011 to 2020. The study analyses the data with the aid of E-view statistical package for descriptive and correlation analysis and STATA 11 after testing for the best estimator from pool OLS, fixed effect and random effect estimator based on Breusch and Pagan LM test, F-test and Hausman test. Deposit to asset ratio has negative but statistically insignificant relationship with returns on assets of DMBs. Cash reserve ratio has positive but statistically insignificant relationship with returns on equity of DMBs. Loan deposit ratio has negative but statistically insignificant relationship with net interest margin of deposit banks in Nigeria. The study focuses on liquidity management and financial performance of deposit money banks in Nigeria. However, financial performance is a broad concept, while ROE is a key profitability measure, other performance indicators such as return on assets (ROA), net interest margin (NIM), and earnings per share (EPS) may provide a more comprehensive view.

Theoretical Foundation

Liquidity Preference Theory

The theory was advanced by Keynes (2006). According to the liquidity preference theory, the interest rates are determined by the demand for and supply of money balances. The theory assumes that people's demand for money is not for transactions purpose but as a precaution and for speculative purposes. The transaction demand and precautionary demand for money increase with income, while the speculative demand is inversely related to interest rates because of the forgone interest. The supply of money is determined by the monetary authority (the central bank), by the lending of commercial banks and by the public preference for holding cash (Were, Kamau, Sichei and Kiptui, 2013).

Consequently, current interest rates reflect expected inflation rates, income (GDP) and expected money supply changes (Were, Kamau, Sichei and Kiptui, 2013). Critics of this theory argue that the liquidity preference theory of interest suffers from a fallacy of mutual determination. Keynes alleges that the rate of interest is determined by liquidity preference. The critics state that "The Keynesians therefore treat the rate of interest, not as they believe they do as determine by liquidity preference- but rather as some sort of mysterious and unexplained force imposing itself on the other elements of the economic system (Were, Kamau, Sichei and Kiptui, 2013).

The Central Bank of Nigeria (CBN) influences money supply and liquidity through instruments such as CRR, liquidity ratio, and OMO. For example, an increase in CRR reduces banks' lending capacity, constraining the money supply and raising interest rates. Similarly, OMO sales mop up excess liquidity from the system, thereby tightening credit availability. Liquidity Preference theory provide a robust foundation for analyzing the effect of monetary policy on commercial bank profitability. The theory further explains how changes in monetary policy variables directly alter banks' liquidity positions, lending capacity, and reserve rate, thereby affecting profitability. Thus, the theory strengthens the study by highlighting both the broader economic transmission mechanism and the bank-specific liquidity and reserve rate effects of monetary policy in Nigeria.

The following research hypothesis, were formulated in a null form:

Ho_1: Open market operation has no significant effects on the return on equity of commercial banks in Nigeria.

Ho_2: Cash reserve ratio has no significant effects on the return on equity of commercial banks in Nigeria.

3.0 Research Methodology

This study examined the relationship between effect of monetary policy variables on the profitability of commercial banks in Nigeria. ex-post facto research design was employed in which data were collected once, analyzed and interpreted statistically to generate the findings and conclusion or make references concerning the study population. The population of this study consists of all commercial banks in Nigeria that are licensed by the Central Bank of Nigeria (CBN). As at 2024, there are 22 commercial banks operating in Nigeria.

A total of 14 commercial banks were selected as the sample for this study. The selection criteria are based on, availability of consistent financial data from 2014 to 2023. This study adopts a purposive sampling technique. Purposive sampling (also known as judgmental sampling) was used because it allows the selection of banks that meet specific criteria relevant to the research. The data gathered for the study can be evaluated using a number of techniques. Both descriptive and inference statistic s used to analyze the data in this study. The descriptive analysis is anchor on the presentation, and discussion of fundamental descriptive elements such as mean, median, minimum value, maximum value, skewness, kurtosis, and normality test. The Panel regression model was employed for the inferential statistic. In order to keep in line with the assumptions surrounding ordinary least square model (OLS), these diagnostic tests need to be conducted to ensure the results are not in any way false in nature. These tests include: multicolinerailty test, heteroskedasticity test, normality test, and the Hausman specification test.

3.1 Variables Measurements

For the purpose of this study the following variables were extracted from the secondary sources identified earlier. These variables served as instruments used in arriving at or drawing out relevant and meaningful conclusions about the topic in question.

Variables	Proxies	Measurement	A-priory Expectation	Sources
Dependent	Return on equity	Net income divided by shareholder's equity		
Independent	Open Market Operation	Average of Treasury Bill rates for the year	Negative (-)	Shirya, Njoka and Abdul (2023)
Independent	Cash Reserve Ratio	Weighted Average of CRR for the year	Positive (+)	Oluyomi and Joseph (2024)

Source: *(Researcher, 2025)*

3.2 Model specification

Multiple linear regression analysis models will be used in analysing the data collected. The regression model is selected because it assumes linearity and normality, allowing it to determine the influence of independent variables on the dependent variable. The model for this study is adapted from Salihu and Muhammed (2022) with little modification, it is stated as follows:

Y = F (OMO and CRR) …….....equation

ROEit = β0 + β1OMOit + β2CRRit + εit……. i

From the model above;

i is the number of individual companies;

t is the time period from 2014-2023;
β0 is the intercept;
β1 to β2 stands for coefficient of independent model;
ε represents error term.

4.0 Data presentation and results of analysis

Data presentation helps in establishing a foundational understanding of the dataset through the presentation of descriptive statistics for both dependent and independent variables. Subsequently, the methodological approach, emphasizing the crucial selection between fixed and random effects models via the Hausman test. The results of the multiple regression analysis, based on the chosen random effects model, are then presented, followed by a rigorous examination of the study's hypotheses.

The Descriptive Statistics

Table 4.1 Descriptive Statistics of Variables of the Study

	ROE	OMO	CRR
Mean	0.153914	0.112493	0.250880
Median	0.148350	0.133150	0.238750
Maximum	0.570000	0.165000	0.356300
Minimum	-0.056	0.002330	0.150000
Std. Dev.	0.105146	0.047963	0.052315
Skewness	0.745271	-1.3155	0.166493
Kurtosis	3.886257	3.418068	3.182146
Jarque-Bera	17.54182	41.39641	0.840335
Probability	0.000155	0.000000	0.656937
Sum	21.54790	15.74902	35.12320
Sum Sq. Dev.	1.536731	0.319761	0.380425
Observations	140	140	140

Source: Author's Computation from the Annual Report Data of Sampled Firms Using EViews, 13 (2025)

Table 4.1 reveals that the Return on Equity (ROE) for the studied companies exhibits a mean of 0.1539 and a median of 0.1484, indicating a relatively symmetrical distribution and suggesting that, on average, these companies generate a positive return on shareholder investments. This close alignment of mean and median implies a balanced central tendency, signifying that the companies are, on the whole, profitable and creating value for their shareholders. However, the wide range between its maximum (0.57) and minimum (-0.056) values, coupled with the highest standard deviation (0.1051), indicates substantial variability within the dataset. The positive skewness (0.745271) suggests a distribution with a longer right tail, and the kurtosis (3.886257) points to a leptokurtic distribution, implying heavier tails and a sharper peak than a normal distribution. The Jarque-Bera test's low probability (0.000155) confirms that ROE deviates significantly from a normal distribution, highlighting the presence of outliers or extreme values.

Table 4.1 provide that Open Market Operations (OMO) data, with a mean of 0.1125 and a median of 0.1332, reveals a negatively skewed distribution, indicating that while the average OMO value is 0.1125, the majority of observations are concentrated above this mean. This skewness suggests a pattern in the central bank's open market activities, potentially reflecting a policy approach that favors higher OMO values and offering insights into market liquidity and the central bank's operational stance, indicating a slight negative skewness (-1.315461). This suggests that the distribution has a longer tail towards lower values. The standard deviation (0.047963) is considerably lower than ROE's, reflecting less variability. The kurtosis (3.418068) also indicates a leptokurtic distribution. The Jarque-Bera test reveals a very low probability (0.000000), indicating a significant deviation from normality. This implies that the distribution of OMO is not symmetrical and may contain outliers on the lower end.

Table 4.1's Cash Reserve Ratio (CRR) data, with a mean of 0.2509 and a median of 0.2388, reveals a relatively symmetrical distribution, indicating that the typical reserve requirements during the studied period averaged around 25.09%. This close alignment of the mean and median reflects a balanced central tendency, providing insights into the central bank's liquidity management and regulatory stance, and highlighting the CRR's impact on the lending capacity and overall stability of the banking system, indicating a relatively symmetrical distribution. The standard deviation (0.052315) is moderate. The skewness (0.166493) is close to zero, suggesting a nearly symmetrical distribution. Notably, the Jarque-Bera test's probability (0.656937) indicates that CRR is normally distributed, unlike the other three variables. This suggests that the CRR data is well behaved and fits a normal distribution.

Jarque-Bera Test: The Jarque-Bera test is a statistical test used to determine whether sample data have the skewness and kurtosis matching a normal distribution. It calculates a statistic based on the sample's skewness and kurtosis, comparing it to the expected values for a normal distribution. A low probability value (p-value) from the Jarque-Bera test indicates that the data significantly deviate from a normal distribution. In this case, ROE and OMO, have very low p-values, suggesting non-normality, while CRR has a high p-value, indicating normality. This test is crucial for assessing the suitability of statistical methods that assume normality.

4.1 Fixed and Random Effects Models (Hausman Test)

In panel data regression analysis, the process begins with the Hausman specification test. This test helps distinguish between the Random effect (RE) and Fixed effect (FE) models by examining the null hypothesis that the individual effects are uncorrelated with the other regressors in the model. If this null hypothesis is not rejected, the RE model is preferred over the FE model, as it suggests that the RE model provides a more efficient and unbiased estimation.

Table 4.2: Result of Hausman Tests

Correlated Random Effects - Hausman Test

Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	Appropriate Design	Research
Cross-section random	0	3	1	Random Effect	

Source: Author's Computation from the Annual Report Data of Sampled Firms Using EViews, 13 (2025)

The Table 4.2 provide Hausman specification test, crucial for determining the appropriate model in panel data regression, yielded a chi-squared statistic of 0.000000 with 3 degrees of freedom and a corresponding probability (p-value) of 1.0000. This high p-value, significantly greater than the conventional threshold of 0.05, indicates that the null hypothesis that the individual effects are uncorrelated with the regressors cannot be rejected. Consequently, the test suggests that the random effects model is the more appropriate research design. The chi-squared statistic, being effectively zero, reinforces this conclusion, implying no significant difference between the coefficients estimated by the fixed and random effects models.

Therefore, the random effects model, known for its greater efficiency, is deemed preferable for this particular panel data analysis.

4.2 The Correlation Statistics

Table 4.2 Correlation Test of Variables of the Study

	1	2	3
1) Return on Equity	1.0000		
2) Open Market Operation	0.0042	1.0000	
3) Cash Reserve Ratio	0.2374	0.5135	0.1760

This correlation matrix Table 4.2 reveals the relationships between four financial variables, where values near +1 or -1 indicate strong positive or negative relationships, and values near zero show independence. The key insight is that the central bank's monetary policy tools, Open Market Operations and the Cash Reserve Ratio show moderate positive correlations with each other (around 0.5), suggesting they often move in tandem. In contrast, a company's Return on Equity (ROE) is largely independent of these policy measures, showing very weak correlations (0.004 to 0.26).

4.3 Random effect result Test of Hypothesis

Table 4.4 Test of Hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.053582	0.043450	-1.233164	0.2196
OMO	-0.053622	0.216382	-0.247811	0.8047
CRR	0.516527	0.221334	2.333701	0.0211
	Effects Specification			
			S.D.	Rho
Cross-section random			0.067667	0.4545
Idiosyncratic random			0.074131	0.5455
	Weighted Statistics			
R-squared	0.206183		Mean dependent var	0.050383
Adjusted R-squared	0.188672		S.D. dependent var	0.082300
S.E. of regression	0.074131		Sum squared resid	0.747368
F-statistic	11.77472		Durbin-Watson stat	0.627198
Prob(F-statistic)	0.000001			
	Unweighted Statistics			
R-squared	0.126319		Mean dependent var	0.153914
Sum squared resid	1.342613		Durbin-Watson stat	0.349131

4.3.1 Open Market Operations and Return on Equity (H1)

Open Market Operations (OMO): The coefficient for Open Market Operations (OMO) is estimated at -0.053622. This variable, with a relatively large standard error of 0.216382, yields a t-statistic of -0.247811. The associated probability (p-value) of 0.8047 is substantially higher than the 0.05 threshold, indicating that OMO is not statistically significant in this model. This suggests that variations in open market operations, as measured by OMO, do not significantly explain the changes in the dependent variable within the context of this regression analysis. This result is consistent with the finding of Shirya, Njoka and Abdul (2023).

4.3.2 Cash Reserve Ratio and Return on Equity (H2)

Cash Reserve Ratio (CRR): The Cash Reserve Ratio (CRR) demonstrates a coefficient of 0.516527, with a standard error of 0.221334. The resulting t-statistic is 2.333701, and the probability (p-value) is 0.0212. This p-value, being less than 0.05, indicates that CRR is statistically significant. The positive coefficient suggests a direct relationship: an increase in the cash reserve ratio is associated with an increase in the dependent variable. This finding implies that the central bank's reserve requirements, as measured by CRR, play a crucial role in explaining the variations in the dependent variable, unlike OMO. This result is consistent with the finding of Oluyomi and Joseph (2024).

5.0 Discussion of Result

The regression analysis aimed to discern the influence of Open Market Operations (OMO) and Cash Reserve Ratio (CRR) on the dependent variable, revealing a significant impact solely from CRR. The hypothesis positing a significant relationship between OMO and the dependent variable was unsupported. The coefficient for OMO, estimated at -0.053622, suggested a negative association, yet this relationship lacked statistical significance ($p = 0.8047$). This absence of significance may stem from OMO's ineffectiveness within the studied context, potential measurement inaccuracies, lagged effects not captured by the model, or the overshadowing influence of other economic factors.

Similarly, the hypothesis that CRR significantly impacts the dependent variable was substantiated. The coefficient for CRR, at 0.516527, was statistically significant ($p = 0.0212$), indicating a positive and direct relationship. This suggests that increases in the cash reserve ratio lead to significant increases in the dependent variable, highlighting CRR's crucial role in influencing the outcome. This significance likely arises from CRR's direct impact on financial institutions' liquidity and lending capacity, its relative policy effectiveness, or the substantial regulatory influence it exerts.

In summary, the results emphasize CRR as the primary driver of changes in the dependent variable, while OMO showed no significant effects. This underscores the importance of regulatory policies, particularly those related to reserve requirements, in shaping the dependent variable's behavior. Future research should consider exploring lagged effects, interactions with other economic variables, refined measurement techniques, and the contextual factors of the study period to provide a more comprehensive understanding of these relationships.

5.1 Conclusion

The statistical analysis conducted on the relationship between selected monetary policy instruments and the dependent variable reveals a nuanced impact. Notably, Open Market Operations (OMO) did not exhibit statistically significant effects, suggesting that fluctuations in these instruments, as measured in this study, were not strong predictors of changes in the dependent variable within the examined model and timeframe.

i. This lack of significance could be attributed to various factors, including the specific measurement of these variables, the dynamic nature of the financial market, or the presence of other influential economic factors not captured in this particular model. In contrast, the Cash Reserve Ratio (CRR) emerged as a statistically significant determinant of the dependent variable. The positive coefficient associated with CRR indicates a direct relationship: as the central bank increases the proportion of deposits that commercial banks are required to hold in reserve, the dependent variable tends to increase.

ii. This finding underscores the potential potency of CRR as a monetary policy tool in influencing the dependent variable. It suggests that changes in the central bank's reserve requirements can have a discernible and direct impact, unlike the effects observed for OMO in this specific analysis. Therefore, the study's findings highlight a differential impact of monetary policy instruments on the dependent variable. While CRR

appears to be a significant lever, the influence of OMO, as modeled here, was not statistically substantiated.

5.2 Recommendations

Based on the analysis, the Cash Reserve Ratio (CRR) emerges as statistically significant monetary policy variables positively influencing the dependent variable.

i. This suggests that the Central Bank of Nigeria (CBN) could strategically leverage CRR adjustments as a key tool to manage the dependent variable. Conversely, Open Market Operations (OMO) did not demonstrate statistically significant effects within the examined model, prompting a need for the CBN to re-evaluate their implementation and transmission mechanisms in the Nigerian financial system. This re-evaluation should consider potential bottlenecks, prevailing market conditions, policy coordination, and alternative measures to enhance their effectiveness.

ii. Further in-depth research into the transmission channels of various monetary policy instruments is crucial to identify specific pathways, lag effects, and the role of other macroeconomic factors. For commercial banks, it is recommended to closely monitor and adapt strategies in response to CRR adjustments, particularly in managing liquidity, lending, and investment portfolios. While OMO was not significant in this specific analysis, banks should remain aware of the broader monetary policy environment.

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