



Monetary Policy, Credit Risk and the Performance of Deposit Money Banks in Nigeria (1981 – 2023)

¹Udegbole, C. Stanley, ²Abraham Oni Agbonkhese, & ³Nwagwu Nkeiruka Onuoha

¹Department of Economics, Topfaith University, Mkpatak, Akwa Ibom State Nigeria

²Department of Economics, Western Delta University, Oghara, Delta State, Nigeria

*Corresponding Author: stanchiley2003@yahoo.co.uk

ABSTRACT

In 2009, ten out of twenty-four (24) banks were found to be in a severe liquidity difficulty according to the results of the audit inspection of banks carried out by the CBN (CBN, 2020). To salvage the situation, the CBN reduced the monetary policy rate. It was expected that, as MPR decreased from 6.89 percent to 6.25 percent in 2010, and prime lending rate fell from 16.75 percent to 15.74 percent (which was a good fit), that non-performing loan would decrease, rather than that, non-performing loan ratio increased to 20.10 percent from 18.14 percent. This study investigated monetary policy, credit risk, and the performance of deposit money banks in Nigeria, between 1981 to 2023. Data for the study were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin (2020) and audited annual report and accounts of Deposit Money Banks (DBMs) between 1981 to 2023. Using the Augmented Dickey Fuller (ADF) unit root test, we were able to analyse the data and find that the integration order was jumbled. In this case, the bound test for long-run relationships between the variables could not be avoided; hence, an autoregressive distributive lag model (ARDL) were used. There was a long-run link between the variables, according to the ARDL bound test. Both the short-term and long-term analyses showed that the monetary policy tools used to measure deposit money banks' performance—net interest income (NII)—had no discernible effect on NII and were negatively correlated with credit risk (MPR, CRR, and NPL). In contrast, a positive and statistically significant link was found between net interest income (NII) and the coefficient of broad money supply (MS) in both the short and long term. Among other things, the report suggests that the country's monetary policymakers bring the policy rate down to single digits, which would lead deposit money institutions to further lower lending rates and make inexpensive loans available to investors. Also, as a policy measure, government should quarterly audit deposit money banks' loan portfolio to reduce the level of nonperforming loans in the industry.

Keywords: Monetary Policy, Money Supply, Deposit Money Banks, Monetary Policy Rate, Central Bank of Nigeria



1.0 INTRODUCTION

The financial services offered by banks are essential to the development and improvement of economies. A viable banking system determines how well the rest of the economy works (Oginyi et al., 2023). Therefore, the rate of economic development in Nigeria is directly correlated to the amount of credit extended to the public by Deposit Money Banks (DMBs). Monetary policy is most effectively administered by deposit money banks, which take deposits as a critical component in the creation of risk assets (loans). The Nigerian central bank controls deposit money banks (DMBs), which in turn effect the interest rates charged by these financial institutions on loans made to their clients. Deposit money institutions are left exposed when policy charges are unfavorable, which may impact their profitability, financial performance, and even put them at danger. Customers and counter parties defaulting are one of the major risks that DMBs in Nigeria face. Due to the dramatic growth in the number of financial institutions during the 1990s, DMBs have seen a rise in their non-performing loan portfolios. For example, in 2009, ten out of twenty-four (24) banks were found to be in a severe liquidity difficulty according to the results of the audit inspection of banks carried out by the CBN (CBN, 2020). A combination of a high percentage of non-performing loans and sloppy credit management practices ate away to their capital base. Even if the goal of the reform and monetary policy is to make the banking industry more stable and competitive, this trend had negative impact on Diamond Bank in 2019. Because of the aforementioned situation, a number of investors and consumers decided to stop making payments to certain banks and instead take out loans from other financial institutions.

To salvage the situation, the CBN reduced the MPR. It was expected that, as MPR decreased from 6.89 percent to 6.25 percent in 2010, and prime lending rate fell from 16.75 percent to 15.74 percent (which was a good fit), that non-performing loan would decrease, rather than that, non-performing loan ratio increased to 20.10 percent from 18.14 percent in 2020. Similarly, between 2019 and 2020, the MPR further reduced from 15% to 13.50%, rather than having a multiplier effect on prime lending rate and non-performing loans, the reverse became the case. For instance, the National Bureau of Statistics (2021) reports that, from 2019 to 2021, non-performing loans have risen to 26.31 percent from 20.10% it was. This situation led to decrease in bank profits resulting to liquidation, merger and acquisition of deposit money banks in Nigeria. Based on this abnormality in the Nigerian financial system, viz a viz, DMBs, this study decided to review a number of literature to ascertain the extent of work done in order to salvage the situation.

This study aims to fill a gap in the literature by examining the relationship between deposit money banks' credit risk (non-performing loan), which is a reliable tool for determining deposit money banks' performance. Previous studies like Uloma (2017), Clement (2019) and Takon (2021) have either focused on monetary policy or money supply and profitability of deposit money banks, but none of these studies have integrated this risk. Furthermore, empirical studies result on the effects of monetary policy, credit risk, and the efficiency of Nigeria's deposit money institutions were contradictory. For instance, while Ulansa (2016) reported a positive relationship between ROA, Taiwo (2017) observed a negative correlation. Thus, this study investigated the



effect of monetary policy rate, non-performing loans and return on investment on the performance of deposit money banks in Nigeria

2.0 EMPIRICAL LITERATURE

Akeem et al. conducted an analysis on Nigerian deposit money banks (DMBs). Akeem et al. (2021) studied how macroeconomic factors impacted Nigerian deposit money banks. The research spanned from 1985 to 2019. The study sets return on asset (ROA) as a dependent variable while using interest rate (INT), money supply (MSS), inflation rate (INF), and real gross domestic product (RGDP) as its independent variables. The performance analysis of deposit money banks used return on assets (ROA) as a metric. The investigation utilized a vector error correcting technique (VECM) to conduct its analysis. The vector error correction estimate demonstrates positive coefficients for both the interest rate (INT) and inflation rate (INF) with respect to the dependent variable (ROA). The dependent variable displays an inverse correlation with both the money supply and real GDP coefficients. Interest rates along with inflation rates demonstrated more enduring impacts on bank performance metrics like ROA than money supply levels and real GDP values. Money supply and real GDP represent the long-term indicators of bank success. The study shows macroeconomic variables impact DMB performance in Nigeria. The study's authors advise that the national government and central bank need to implement measures to manage macroeconomic indicators effectively in order to create an environment that supports business growth and improves DMB performance.

Clement and Nnaji (2019) researched the effects of monetary policy on deposit money institution profitability across Nigeria during the period from 2008 to 2017 over ten years. The study evaluated the effects of monetary policy on Nigerian deposit money banks' profitability by systematically gathering time series and cross-sectional data to create a panel data set. The researchers employed Johansen's multivariate co-integration technique together with an error correction model (ECM) basis for testing co-integration. The study applied the Augmented Dickey-Fuller (ADF) test to the variables resulting in the detection of unit roots. The research team applied panel regression techniques to evaluate their formulated hypotheses. Monetary policy tools like the Cash Reserve Ratio and Monetary Policy Rate played a significant role in shaping the profitability of Nigeria's deposit money banks. The Central Bank of Nigeria needs to adjust the Monetary Policy Rate and Cash Reserve Ratio to enhance liquidity availability. Adjustments to monetary policy would enable deposit money banks to execute their investment and lending functions more effectively. Monetary policy and fiscal policy need to operate together to achieve outcomes that benefit both systems.

Ogunbiyi and Ihejirika (2018) researched how interest rates affect the financial performance of Nigerian deposit money banks. The study implemented multivariate regression analysis inside an econometric framework to analyze national data from 1999 to 2012. The Augmented Dickey Fuller unit root test results allow for classification of the series into either I(0), I(1), or I(2) types of stationarity. The return on assets at the 5% significance level



demonstrates negative and significant effects of maximum lending rate, real interest rate and savings deposit rate on Nigerian deposit money banks' profitability based on the study findings. The analysis demonstrated that there is a statistically significant negative relationship between the real interest rate and the return on equity of Nigerian money deposit banks at an 8% significance level. The research found no statistically significant link between interest rate elements and Nigerian Deposit Money Banks' Net Interest Margin. This research reveals critical insights about how interest rate volatility impacts the financial success of banks. The report recommends that the government should establish monetary policies designed to increase the profitability of Nigeria's deposit money banks. They need to assess and upgrade the existing rules about bank lending rates through a supervisory and regulatory frame work that demonstrates both efficiency and effectiveness.

Study conducted by Ndubuaku et al. (2017) examined the impact of diverse monetary policy regimes on the performance of DMBs in Nigeria. The research report utilized a descriptive and ex-post facto study design. The time series data for this research came from the Statistical Bulletin of the Central Bank of Nigeria. The study divided its research into two periods which spanned from 1986 to 1999 and from 2000 to 2013. The research demonstrated that total assets value together with deposit mobilization and loans and advances and private sector credit remained stable despite changes to the monetary policy rate throughout the SAP period. The effect of the monetary policy rate became significant on these variables during the post SAP period. Policymakers need to supervise Monetary Policy instruments to achieve the targeted economic activity levels within the banking sector. The report advised restricting political interventions to avoid causing performance disruptions in the banking sector.

Uloma (2017) investigated how the monetary policy tools employed by Nigerian monetary authorities influenced the turnover ratio of deposit money banks in Nigeria. The study investigated how monetary policy tools influenced banking performance in Nigeria by examining their impact on deposit money banks' turnover ratio. The monetary policy tools used by Nigerian authorities consist of money supply, liquidity ratio, monetary policy rate and cash reserve ratio. Researchers selected the ordinary least square (OLS) approach because its fundamental simplicity and global popularity allow researchers to effectively capture the essence of their work. The study maintains a confidence level of 5%. The analysis results indicate that monetary policy influences bank performance indices such as TOR, BAS, and LADV. The research shows that the link between monetary policy tools and bank performance indices varies because each measurement instrument affects them differently. The liquidity returns ratio (LRR) displayed a negative statistically significant relationship with bank turnover rate (TUR) while money supply (M2) showed a positive statistically significant relationship with bank assets (BNKAS) and bank loan and advances (LADV) demonstrated a negative statistically significant relationship with CRR as the sole variable considered.



Takon and his team analyzed the performance of Nigerian deposit banks. (2021) in relation to monetary policy dynamics. The research aimed to examine the impact of money supply, exchange rate, and interest rate on bank performance. This study implemented an exploratory research strategy to examine the impact of monetary policy on Nigerian bank profitability. The ordinary least square multiple regression statistical procedure established the relationship between dependent and independent variables using secondary data sources. Profitability was positively impacted by money supply and exchange rate while interest rate showed a negative effect. This research indicates that money supply should be given more attention due to its significant effect on Nigerian banks' profitability. The government should ensure that the money supply reaches the precise level needed to promote both environmental sustainability and long-term economic growth.

Hussaini et al. conducted a study on how monetary policy tools affected Nigeria's GDP growth between 1986 and 2018. (2020). ARDL analysis examined the money supply, interest rate, and exchange rate as policy variables along with GDP as the goal variable to explore their short-term and long-term dynamic connections. The long-run model estimation shows that the logarithm of GDP responds positively to the logarithm of money supply while the present exchange rate negatively impacts the target variable and shows positive effects on it in the following period. The current level of interest rate produces a significant positive impact on Nigeria's economic development. The target's one-period lag has short-term effects on its current value which resemble the exchange rate's behavior because while the exchange rate currently reduces economic growth it enhances growth with one-period lag. The error correction mechanism indicates that variables reach their equilibrium state within the short term at an adjustment rate of 19%. The study demonstrates that monetary policy instruments significantly influence Nigeria's economic development trajectory. The monetary authority must implement necessary measures to ensure proper use of economic instruments by maintaining favorable conditions for interest rates, exchange rates, and money supply to achieve the desired economic development rate.

Taiwo and colleagues performed a study spanning 1998 to 2014 to examine credit risk management effects on the Nigerian deposit money banks performance and bank lending growth. Taiwo and their colleagues (2017) examined how credit risk management affected Nigerian deposit money banks' performance as well as bank lending expansion. The empirical investigation used World Bank (WDI) 2015 and CBN Statistical Bulletin 2014 as secondary sources. The research team applied a multiple linear regression model to analyze the gathered time series data. Effective credit management procedures enable banks to draw in more savers and investors which raises profitability through increased funds available for loans and advances. The findings demonstrate that credit risk management practices show no significant impact on the scaling of total loans and advances provided by Nigerian deposit money institutions. Nigerian DMBs need to rigorously adhere to their credit evaluation criteria to ensure only borrowers with favorable credit histories receive loans. Financial



institutions must reserve their lending services for borrowers who have achieved good to excellent credit ratings.

Ulasan's 2016 research analyzed how credit risk and non-performing loans affected Nigerian deposit money banks' profitability between 1995 and 2015. The investigation utilized both Granger causality tests and a parsimonious error correction model. Researchers collected study information from existing secondary sources. The study demonstrates that credit risk management indicators have a substantial impact on deposit money banks' performance when evaluated by ROA and net profit margin. The study revealed a one-way Granger causality link between net profit margin and return on assets. The report advises deposit money institutions to adopt careful approaches for credit standards to maintain their operational efficiency.

3.0 METHODOLOGY

The research strategy used in this study was an ex-post facto analysis, and Milton Friedman's monetarist theory served as the theoretical foundation (1956). This theory is based on the premise that changes in the money supply have a direct impact on prices and production or income, provided that the velocity of money in circulation remains constant. Therefore, the actual value of money is closely related to changes in the money supply.

3.1 Model Specification

DMBLSME = f (MS, INT, MPR, LR, INF, EXR)

Where: DMBLSME = Deposit Money Banks loans and Advances to SME.

MS= Money supply, INT=Interest rate, MPR = Monetary Policy Rate, LR = Liquidity Ratio of DMBs, INF= Inflation Rate, EXR = Exchange Rate. The model is expanded as follows: $NII = f(CRR, MPR, MS, NPL)$, $NII = \beta_0 + \beta_1 CRR + \beta_2 MPR + \beta_3 MS + \beta_4 NPL$, $NII = \beta_0 + \beta_1 CRR + \beta_2 MPR + \beta_3 MS + \beta_4 NPL + \mu$, where μ = Error term, β_0 = Constant, $\beta_1 - \beta_4$ =

Estimated Parameter, **Apriori**; $\beta_1, \beta_2, \beta_4 < 0$ $\beta_3 > 0$. The sign of β_1, β_2 and β_4 are expected by theory to have a negative relationship with net interest income as a proxy for performance of deposit money banks, since increase in CRR, MPR, and NPL will reduce the profit of deposit money banks, while β_3 is expected by theory to have a positive relationship with net interest income as a proxy for performance of deposit money banks.



4.0 DATA ANALYSIS AND RESULT

Table 4.1: Net interest Income (NII), Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR), Broad Money Supply (MS), and Non-performing Loans (NPL), covering from 1981 to 2020.

Year	NII%	MPR%	CRR%	MS ₦'B	NPL ₦'B
1981	4.06	6.00	9.5	14471.0	25,370.16
1982	4.89	8.00	10.7	15786.7	17,797.94
1983	5.06	8.00	7.1	17687.9	30,466.96
1984	5.88	10.00	4.7	20105.9	39,250.40
1985	6.51	10.00	1.8	22299.2	26,164.90
1986	7.7	10.00	1.7	23806.4	12,500.00
1987	8.62	12.75	1.4	27573.5	25,521.00
1988	8.66	12.75	2.1	38356.8	30,433.00
1989	7.33	18.50	2.9	45902.8	30,740.00
1990	6.78	18.50	2.9	52857.0	10,950.00
1991	7.01	15.50	2.9	75401.1	24,416.53
1992	6.42	17.50	4.4	111112.3	31,546.92
1993	10.11	26.00	6.0	165338.7	82,496.44
1994	8.11	13.50	5.7	230292.6	44,246.18
1995	5.81	13.50	5.8	289091.1	17,254.60
1996	5.84	13.50	7.5	3458554.0	11,769.37
1997	7.16	13.50	7.8	413280.1	63,542.64
1998	7.32	13.50	8.3	488145.8	10,834.61
1999	7.86	18.00	11.7	628952.2	15,043.03
2000	7.51	14.00	9.8	878457.3	22,215.01
2001	9.29	20.50	10.8	1269322.0	14,931.00
2002	8.09	16.00	10.6	1505964.0	19,803.00
2003	8.09	15.00	10.0	1952921.0	25,577.00
04	7.84	15.00	8.6	2131819.0	29,883.00
2005	7.95	13.00	9.7	2637913.0	16,643.00
2006	7.54	10.00	2.6	3797909.0	81,513.00
2007	10.58	9.50	2.8	5727401.0	11,714.30
2008	19.77	9.75	3.0	8008204.0	12,267.30
2009	22.75	6.00	1.3	9411112.0	54,028.47
2010	18.96	6.25	1.0	11034940.9	13,612.10
2011	15.07	12.00	8.0	1217249.2	11,091.00
2012	18.31	12.00	12.0	1389589.1	26,295.00
2013	17.85	12.00	12.0	15158622.2	95,244.00
2014	18.59	13.00	20.0	16818486.7	86,456.08
2015	19.64	11.00	20.0	20029831.1	96,297.29
2016	20.5	14.00	22.5	25359800.0	86,588.00
2017	19.55	14.00	22.5	25944600.0	74,528.47
2018	17.54	14.00	22.5	30383000.0	82,441.10
2019	17.63	13.50	22.5	35635001.3	87051.22
2020	18.83	12.50	27.5	38627352.1	80,114.01

Source: Central Bank of Nigeria (CBN) Statistical Bulletin (2020), and audited annual report and accounts of deposit money banks (DBMs) various years.

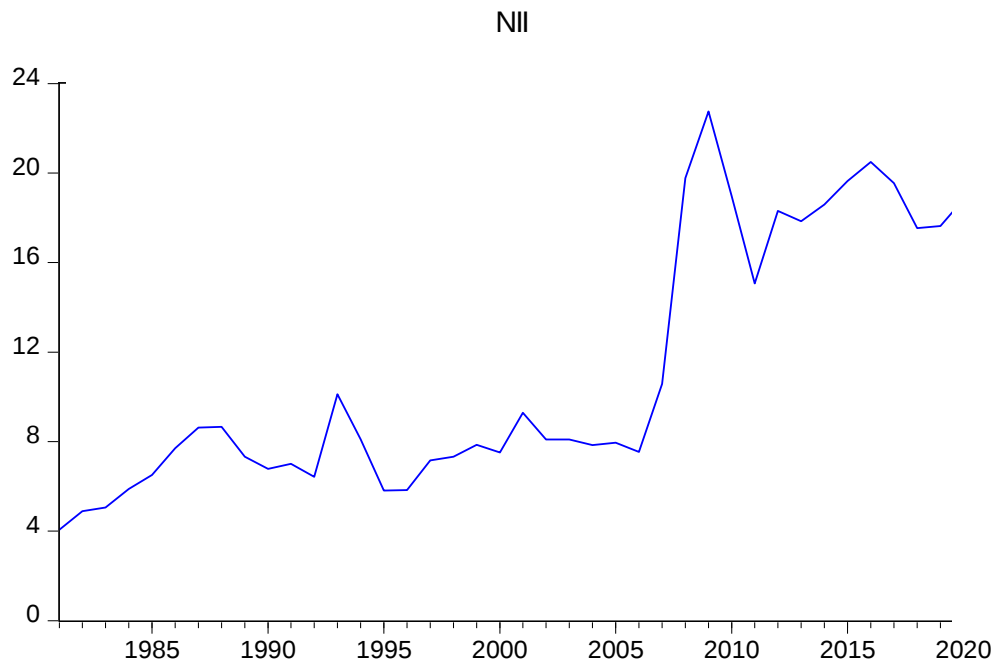


Fig 4.1: Trends of Net interest Income (NII) from 1981 to 2020

Fig 4.1 shows graphical presentation of NII, as a proxy for performance of deposit money banks and stood at 4.06% in 1981 and increased to 6.78% in 1988. The implication is that, there was commendable increase in bank's profitability. The period between 1989 and 2007 experienced high-level fluctuation of net interest income, affecting bank's willingness to lend, disposable income and capital inflow. However, there was a gradual up-ward movement until 2010 when it declined to 2020.

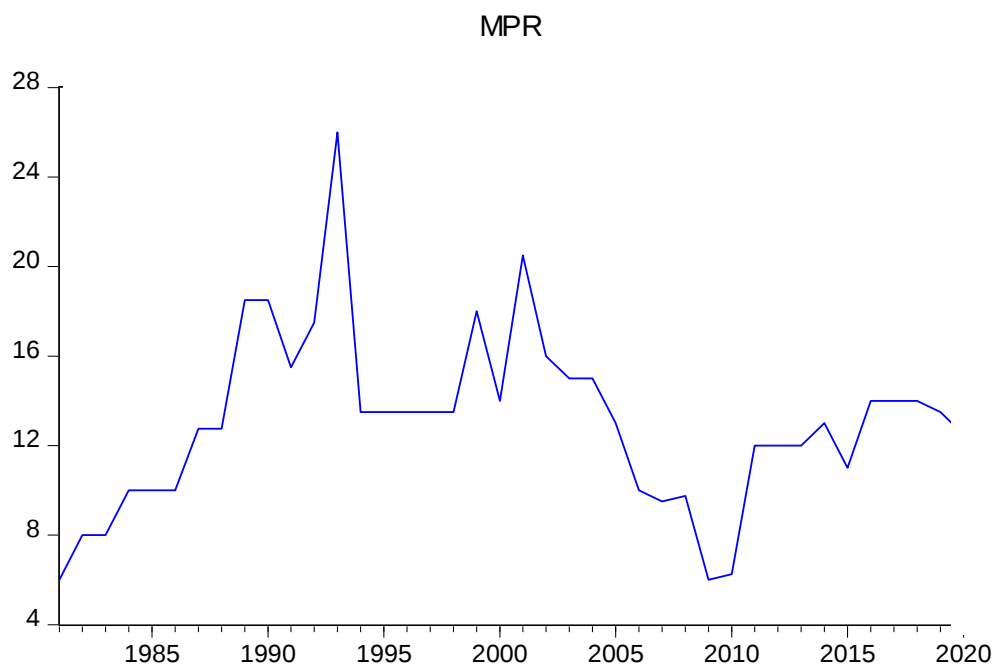


Fig 4.4: Trends of Monetary Policy Rate (MPR) from 1981 to 2020

Fig 4.24 shows graphical presentation of Monetary Policy Rate (MPR), as a proxy for monetary policy stood at 6.00% in 1981 but increased to 18.50 in 1990. It declined from 18.50 to 17.50% between 1991 and 1992. The monetary policy rate moved-up to 26.00% in 1993 and declined to 14.00% in 2000. Since then, it has been experiencing fluctuation. This might be the reason why economic activities such as prices of goods and services are still very high in country.

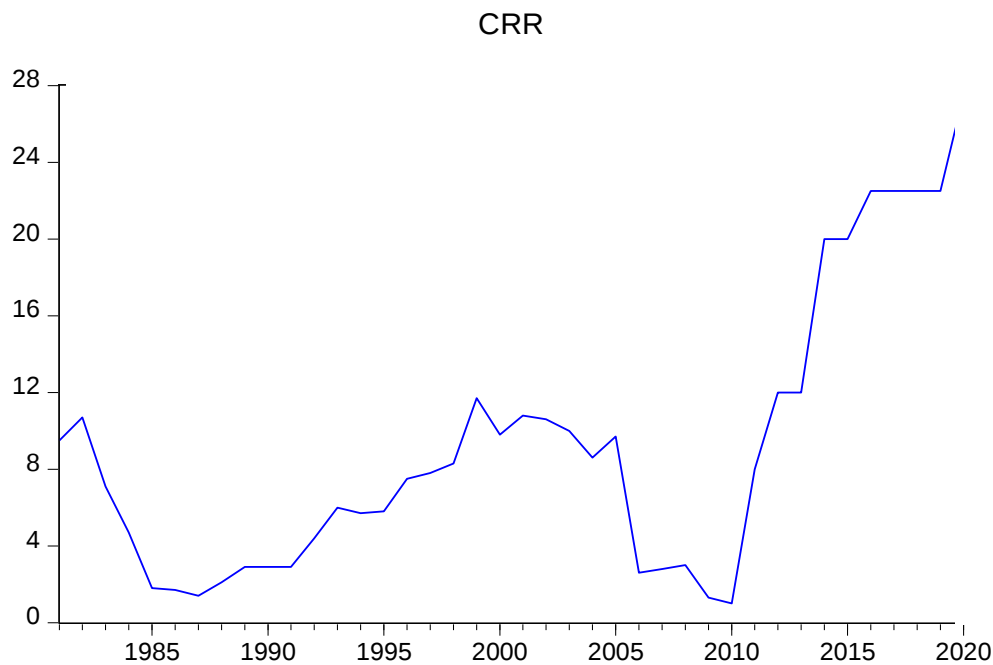


Fig 4.5: Trends of Cash Reserve Ratio (CRR) from 1981 to 2020

Fig 4.5 shows graphical presentation of Cash Reserve Ratio as a proxy for monetary policy stood at 9.5% and 10.7% between 1981 and 1982. The value of CRR declined from 10.7% in 1982 to 2.9% in 1991. Cash reserve ratio experienced a little fluctuation between 1992 up to 2009 and moved-up till 2020. This might be the reason deposit money bank lending rate is on the high side, making it practically impossible for investors to access cheap loans for investment purposes.

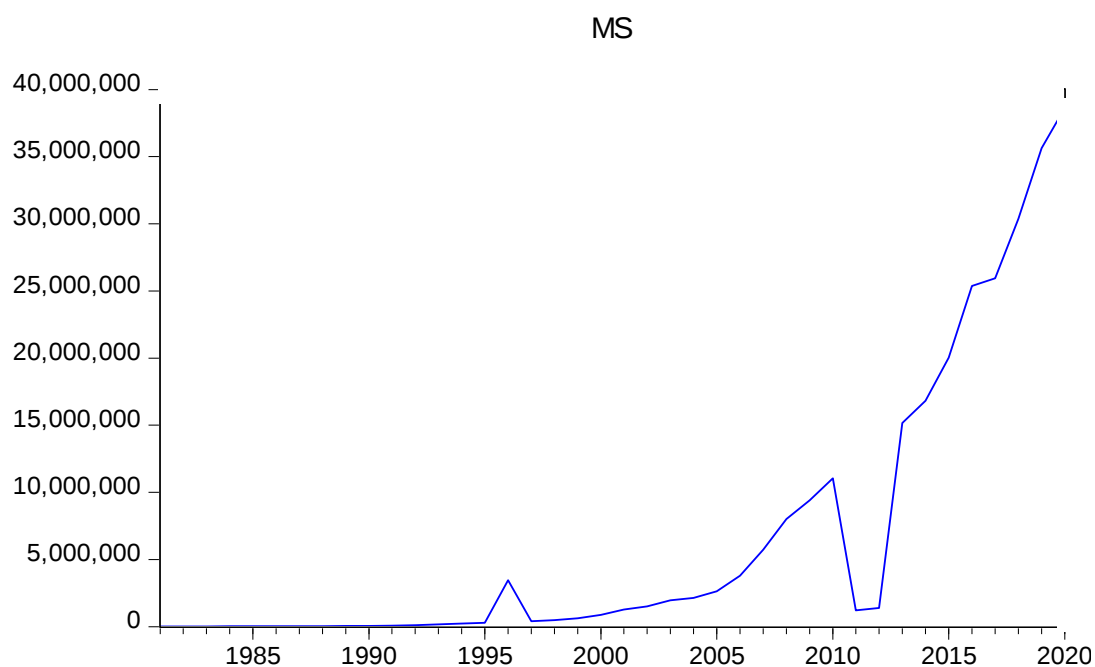


Fig 4.6: Trends of Money Supply (MS) from 1981 to 2020

Fig 4.6 shows graphical presentation of Broad Money Supply (MS), as a proxy for monetary policy was basically flat and stood at #14471.0 billion in 1981. This value gradually increased to # 38627352 in 2020. The continuous increase in the supply of money by the monetary authority might be responsible for the high inflation rate in the country.

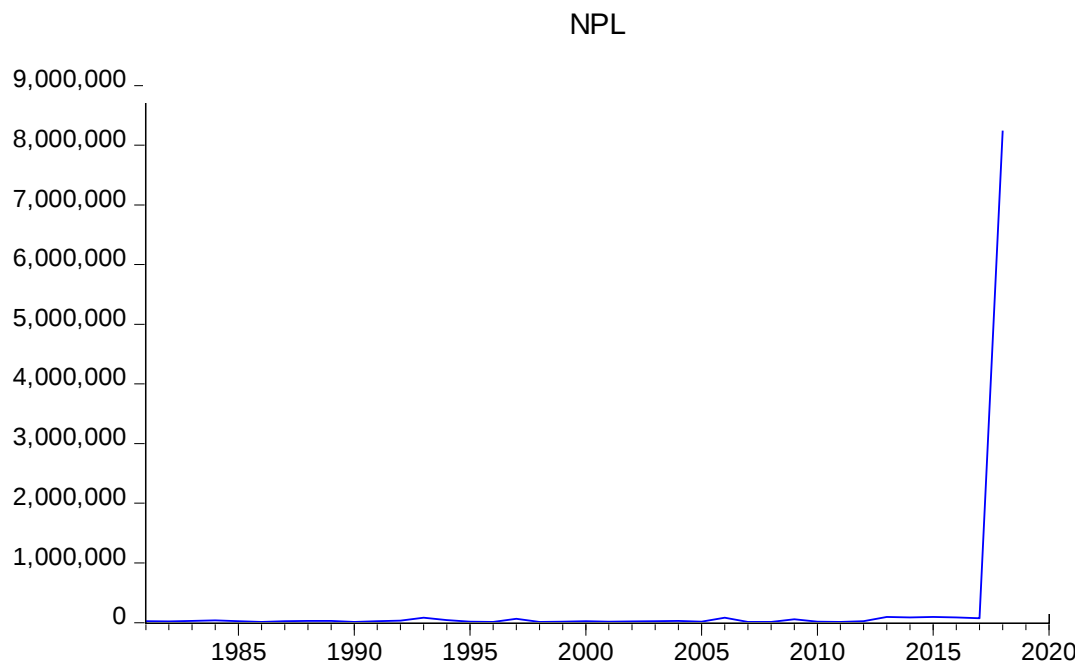


Fig 4.7: Trends of Non- Performing Loans (NPL) from 1981 to 2020

Fig 4.7 shows graphical presentation of Non- Performing Loans (NPL), as a proxy for credit risk. The graph above and figure in table 4.1 shows that, non-performing loans was reasonably flat between 1981 up to 2016. This might be various reforms put in place by the monetary authority before and after the Soludo's administration as the CBN governor. But non-performing loans has re-surfaced in the books of deposit money banks resulting to merger and introduction of new banks such as Heritage bank and Zeb bank.

Table 4.2: Descriptive Statistics

	NII	MPR	CRR	MS	NPL
Mean	11.07525	13.05000	9.115000	6626463.	251924.8
Median	8.090000	13.25000	7.900000	1243286.	25870.95
Maximum	22.75000	26.00000	27.50000	38627352	8244110.
Minimum	4.060000	6.000000	1.000000	14471.00	10834.61
Std. Dev.	5.684818	3.985229	7.140766	10761719	1331818.
Skewness	0.696993	0.696769	1.002578	1.720432	5.914518
Kurtosis	1.831986	4.496772	3.048128	4.752482	35.99745
Jarque-Bera	5.512420	6.970452	6.704951	24.85123	1945.533
Probability	0.063532	0.030647	0.074998	0.000004	0.000000
Sum	443.0100	522.0000	364.6000	2.65E+08	9573142.
Sum Sq.					
Dev.	1260.369	619.4000	1988.631	4.52E+15	6.56E+13
Observations	40	40	40	40	40

Source: E-view 10 Output

Figure 4.2. There were a total of forty observations included in this analysis, including three dependent and four independent variables. An average of 11.07525 was the net interest income recorded. A standard deviation of 5.684818 is associated with a range of values between 4.060000 and 22.75000. Just as MPR had a mean of 13.55000, with minimum and maximum values of 6.000000 and 26.00000 respectively, and a standard deviation of 3.985229, CRR had a mean of 9.115000, with minimum and maximum values of 1.000000 and 27.50000, respectively, and a standard deviation of 7.140766. In particular, the MS for the whole economy showed a mean of 6626463, a low of 14471.00, and a high of 38627352, with a standard deviation of 10761719. Last but not least, NPL recorded a mean of 251924.8, a minimum of 10834.61, a maximum of 8244110, and a standard deviation of 1331818. A simple way to look at it is that standard deviations show how much different variables are from their respective means. While skewness revealed moderate skewness for NII, MPR, and CRR (0.696993, 0.696769, and 1.002578, respectively), substantial skewness for MS and NPL (1.720432, and 5.914518, respectively) was shown by the study's other variables, kurtosis and Jarque-Bera. Within 1 and above, its coefficient is located. Conversely, kurtosis assesses how flat or peaky a series' distribution is. This means that NII is platykurtic (coefficient = 1.83) while MPR, MS, and NPL are leptokurtic (kurtosis = 4.49, 4.75, and 35.9, respectively), but NII is platykurtic (coefficient = 1.83). Additionally, CRR's coefficient of 3.04 indicates that it is mesokurtic, since it is either precisely or almost 3. Jarque-Bera compares the skewness and kurtosis of all the variables and finds the difference. With respect to the variables' Jarque-Bera p-values, we may reject the null hypothesis if MPR, MS, and NPL are all less than 0.05, but we can accept the alternative if NII and CRR are both more than 0.05. This indicates that the data follows a normal distribution. Hence, a unit root test is performed on the variables.

4.3: Unit Root Test on Monetary Policy, Credit Risk and Performance of deposit money banks.

Variable	ADF statistics at levels	1% critical value	5% critical value	ADF statistics at First Difference	1% critical value	5% critical value	Order of integration
NII	-1.132795	-3.610453	-2.938937	-5.717828	-3.621023	-2.943427	1(1)
MPR	-3.331415	-3.610453	-2.938987				1(0)
CRR	0.386847	-3.610453	-2.938987	-5.337066	-3.65588	-2.941145	1(1)
LMS	-0.973959	-3.610453	-2.938987	-7.617281	-3.65588	-2.941145	1(1)
LNPL	-1.627167	3.621023	-2.943427	-5.397553	-3.632900	-2.948404	1(1)

Source: Extracts from E-view 10. * Level of significance at 5%

The Augmented Dickey-Fuller (ADF) results indicated that the variables included both I (0) and I (1) series or exhibited different integration orders. Under these circumstances the ARDL



Bounds test approach to co-integration becomes suitable for examining long-term relationships between these variables.

Co-integration Test

Table 4.4: ARDL Bound Test

Test Statistics	Value	K
F-statistics	6.951517	4
Significance	I (0)	1(1)
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Authors computation from E-view 10 Output

According to the bound test result in table 4.3.2 the variables demonstrate long-term relationships because the F-statistic of 6.951517 exceeds the critical values for both lower and upper bounds. Our analysis leads us to determine that a long-term association exists between the variables which results in rejecting the alternative hypothesis.

Table 4.5: ARDL Long-run-run Result

Variable	Coefficient	Std Error	t-Statistics	Prob
MPR	-0.636201	0.303408	-2.096848	0.0477
CRR	-0.437408	0.298128	-1.467180	0.1565
LMS	2.121091	0.656795	3.229458	0.0039
LNPL	2.289623	2.344719	0.976502	0.3394

Source: Authors computation from E-view 10 Output

The Autoregressive Distributive Lag (ARDL) model demonstrates statistical significance when both MPR and MS are combined with NII. The MPR shows a significant long-term relationship with NII although its coefficient stands at -0.636201. NII declines approximately 64 percent with each unit increase in MPR. Statistical analysis confirms a significant correlation between the monetary policy rate and net interest income at $p = 0.0477$. The long-term analysis revealed a negative correlation of -0.437408 between CRR and NII. Every time CRR increases by one unit net interest income declines by approximately 44 percent. The probability value of 0.1565

indicates that CRR does not have any noticeable influence on NII. The banking industry would face liquidity problems as a result of economic consequences unless the central bank (CBN) and deposit money institutions carefully use their policy tools (MPR, CRR) and reduce loan disbursement rates. This research finding aligns with results from Udeh (2015) and Ogunbiyi and Ihejirika (2018) while opposing findings by Uloma (2017), Clement and Nneji (2019), and Akeem et al. (2021).

The analysis revealed a positive relationship between NII and the log of broad money supply (LMS) at a value of 2.121091. NII experiences a growth of approximately 2.12 units in response to every one unit rise in the broad money supply (LMS). The statistical relationship between broad money supply (LMS) and NII is confirmed by the p-value of 0.0039. The LNPL analysis demonstrated a positive relationship between NII and non-performing loans with a correlation coefficient of 2.289623. NII expands by approximately 2.29 units with each unit increase in LNPL. From an economic perspective deposit money banks' (DMBs') net income margin remains stable despite any increase in nonperforming loans reported in their financial statements. The steps and changes made might have produced the observed result. Our results confirm studies by Uloma (2017), Clement and Nneji (2019), and Akeem et al. (2021).

Table 4.6: ARDL Short-run Estimate

Variable	Coefficient	Std. Error	t-Statistics	Prob
D(MPR)	0.086062	0.120617	0.713511	0.4830
D(MPR(-1))	0.242094	0.120148	2.014960	0.0513
D(CRR)	-0.005917	0.160065	-0.036977	0.9708
D(CRR(-1))	0.215144	0.181150	1.187655	0.2476
D(LMS)	1.048966	0.500246	2.096899	0.0477
D(LMS(-1))	-0.006242	0.495717	-0.012592	0.9901
D(LNPL)	0.359526	0.383117	0.938423	0.3582
D(LNPL(-1))	-0.461768	0.448980	-1.028482	0.3149
Ecm (-1)	-0.411999	0.121325	-3.395834	0.0026

Adj R² = 0.169104, F-statistics = 1.791469 (0.008347), DW = 2.112299

Source: Extracts from E-view 10. * Level of significance at 5%

Table 4.3.4 demonstrates a positive relationship between the coefficient of MPR and NII across the previous year's period. For every one unit rise in MPR the NII experiences an approximate growth of 24%. The p-value of 0.0513 allows us to confidently establish a relationship between MPR and NII. Deposit money banks in Nigeria can only ensure profitability through their



loanable assets by either returning or earning profits. The robust demand for loanable funds persists as a possible cause despite the increase in the monetary policy rate.

The short-run ARDL analysis revealed a negative and statistically significant relationship between NII and CRR. Deposit money institutions will experience reduced NII efficiency with each one-unit increase in the cash reserve ratio. This has real-world economic consequences: A rise in the Central Bank of Nigeria's cash reserve ratio decreases deposit money banks' lending capacity by -0.005917. The ability of Nigeria's deposit money institutions to operate efficiently will suffer additional setbacks because of this development. The p-value of 0.9708 demonstrates that changes in the Cash Reserve Ratio do not impact Return on Equity. The LMS showed a weak yet statistically significant positive correlation with the NII at 1.048966. A one-unit rise in Nigeria's broad money supply (MS) produces an approximate 1.048-unit growth in the NII for measuring deposit money institution efficiency. When the government utilizes Treasury bills combined with the cash reserve ratio as open market operation instruments it results in increased money supply within the economy. Through this economic mechanism the real sector will be positioned to make large-scale investments while retaining part of their returns. Deposit money institutions will experience enhanced performance due to the multiplier impact of this situation. There exists a negative (-0.461768) and negligible (0.3149) correlation between NII and the logarithm of non-performing loans (LNPL).

The coefficient estimates for ECM (-1) displays a negative value when tested at a significance level of 0.05. The model will achieve long-run equilibrium with a 41% annual rate of convergence. An annual correction rate of 41% can be applied to address previous year's errors. The corrected R-Square (R²) value shows that 17% of the total variance in NII can be explained by the independent variables MPR, CRR, MS and NPL. The F-statistic reaches statistical significance at the 5% level which indicates that the model itself is significant. The Durbin-Watson statistics of 2.112299 demonstrate the absence of serial correlation in this model.

5.0 CONCLUSION

From the results, the conclusion of this study is that, high rate of MPR and NPL will negatively affect the performance of deposit money banks in Nigeria. This implies that, high MPR will send negative signal to DMBs to increase their lending rate. This scenario will make it practically difficult for investors to access cheap loans for investment purpose. Also, a situation where the non-performing loans exceed the budgeted normal loss, the banks would have liquidity problem which might lead to winding up of deposit money banks.

6.0 RECOMMENDATION.

The study recommends that, Monetary policy authorities should immediately review the monetary policy rate to a single digit which will further reduce the lending rate of all DMBs in the country downward to enable investors access cheap loans. Also, as a policy measure, the CBN should quarterly audit deposit money banks' loan portfolio to reduce the level of nonperforming loans in the industry, and deposit money banks should also device a central loan portfolio that would make it difficult for investor and individual to access loans when still indebted with other banks.



Ethical clearance

Ethical consent was sought and obtained from the participants used in this study. They were made to understand that the exercise was purely for academic purposes, and their participation was voluntary.

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The study was not funded.

Conflict of Interest

I, Udegbule, Chima Stanley, declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Authors' Contributions.

I conceived the study, including the design, I collated the data, and handled the analysis as well as the interpretation. All authors have critically reviewed and approved the final draft, and are responsible for the content and similarity index of the manuscript.

Availability of data and materials.

The datasets on which conclusions were made for this study are available on reasonable request.

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