Macroprudential Policy, Monetary Policy and Banking Sector Performance in Nigeria

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Abstract

This study examined the impact of macroprudential policy, monetary policy and banking sector performance in Nigeria. This study used ex post facto research design and secondary data from Quarter 1 2007 to Quarter 4 2022. Data were sourced from the International Monetary Fund, Central Bank of Nigeria, and World Bank Database. The study utilized ARDL-bound testing and ARDL-ECM to estimate the data. It was found that in the long run macro-prudential policy Capital Adequacy and Liquidity (Liquid Assets to Short-term Liabilities) have a positive relationship with banking sector performance in Nigeria. More so, Liquidity (Liquid Assets to Total Assets) and Asset Quality have a negative and significant relationship with banking sector performance in Nigeria. In addition, in the short-run, monetary policy tools were more effective and it was found that Exchange Rate and Monetary Policy Rates have a negative and significant relationship with banking sector performance in Nigeria, while Money Supply has a positive relationship with banking sector performance in Nigeria. It was concluded that macroprudential policy tends to be more effective on banking sector performance in Nigeria in the long run, while monetary policy tends to be effective in the short run. Hence, both policies complement each other rather than substitute in mitigating risks Inherent in banking sectors.
Keywords: Banking Sector Peformance; Macroprudential Policy; Monetary Policy; Return on Assets; Return on Equity

Introduction

Banks being part of financial institutions are very significant in every economy specifically developing economies such as Nigeria where funds are raised (deposits) and expended in the form of loans primarily to sectors (individuals and corporate entities) for productive purposes (Alalade, Oseni, & Adekunle, 2020 and Uruakpa, 2019). The banking industry activities cut across much functionality; hence profitable and sound banks are sine qua non to actualization of economic growth initiatives (Davis, Dilruba & Noel, 2020). Undoubtedly, banks' investments and other financial commitments are geared towards making financial gains (Profit) which means that the higher the investment engagements the more expectations to attain profitability, stability and growth.

In Nigeria, profitability performance in the banking industry has been of concern over the years despite policy and regulation reforms such as Structural Adjustment Programs in 1986, financial reforms in 2004 and post-2007/2008 global financial crisis reform, among others. Nigerian banks' Return on Assets (ROA) reached an all-time high in 2010 (3.9%) and lowest a year earlier in 2009 (-8.90%) (Central Bank of Nigeria, 2021). The ROA has been fluctuating since where in 2016 it was 1.29%, which rose to 1.82%, 2.12%, and 2.21% in 2017, 2018 and 2019. However, the Nigerian banking sector ROA declined to 1.73% and 1.32% in 2020 and 2021 respectively. However, in 2022, it increased to 2.19% but this profitability performance is far from satisfactory for the biggest economy in Africa. More so, another profitability measure Return on Equity (ROE) for Nigerian banks over the years is not encouraging because it reached its peak in 2001 at 34.09% and reached an all-time low in 2016 (9.14%) according to World Bank (2022).

The dwindling or downward profitability of Nigeria's banking sector is accounted for as a result of risks within the financial system spectrum. For instance, Loans and advances make up the largest portion of banks' earning assets. Therefore, loan defaults, which lead to bad debts, damage this asset and subsequently decrease bank profitability, as bad debts or provisions for bad debts are charged to the profit and loss account (Oyakhiromhe & Ezu, 2024; Davis et al., 2020). Likewise, Aikman

et al. (2023) pointed out that financial institutions tend to overexpose themselves to risk during the upswing of a credit cycle and become excessively risk-averse during the downswing. More so, Small open economies are typically vulnerable to both domestic and external shocks resulting from the financial system's failure to fulfil its functions (CBN, 2016); this has affected the profitability and soundness of banks in Nigeria and has led to the failures of many.

The forgoing banking industry concerns beg for more robust financial policy regulations such as macroprudential policy and monetary policy which is the traditional regulatory framework to avert banking sectors to go moribund during crises (Akinci & Olmstead-Rumsey, 2018). Macro-prudential policy gained prominent usage alongside monetary policy after the 2007/2008 global financial crises as a regulatory financial framework to curb or manage the effect of crises on banks which affects the profitability and growth of banks (Aikman, Giese, Kapadia, & McLeay, 2023).

In the literature, managing crises bereaving the banking industry using either macroprudential policy, monetary policy or a combination of the two policies is still up for debate among several financial experts and finance institutes. Agbadua and Ezu (2024) assert that monetary policy purposes driven by the Central Bank of Nigeria include ensuring price stability, full employment, smoother business cycle, detecting and preventing financial crises, maintaining overall financial stability through exchange rate, interest rate, money supply, among others. The state of the financial system in Nigeria is marred by a high unemployment rate, inflation rate, and misaligned exchange rate which has affected banking sectors' activities to provide investment funds to investors resulting in declining revenue from loans, as such monetary authority in Nigeria has focused on adjusting monetary policy rate, managed exchange rate regime to ensure stable financial system (Yusuf & Bukar, 2024).

However, the impact of global financial crises especially since the 2007/2008 financial crises globally, has necessitated the full implementation of macro-prudential policy which provides deeper regulation to preserve and ensure stability, soundness and safety of the financial system (Jibrin, Adegbe, & Ogbonnaya, 2020). This crisis brought

out the inefficiency of monetary policy regulations, hence a more robust risk assessment framework that captures both domestic and international institutions and markets with risks associated with them. The macro-prudential policy seeks to attain financial system stability as a whole by providing prudential regulations such as capital adequacy, asset quality, and liquidity, among others to mitigate risk and vulnerability.

From the foregoing, the idea that monetary policy and macroprudential policy are complementary rather than operating in isolation has been the prevailing submission in the literature. Jiang et al. (2019) opined that monetary and macroprudential policies should be interconnected when managing banking sector crises and vulnerabilities which affect profitability. More so, Gonzalez (2022) and Anwar et al. (2024) state that using only macroprudential policy may be expensive to execute, hence it should be complemented with monetary policy for banking sector stability. As such, macroprudential policy while it may play the monetary policy role of price stability, is specifically targeted at preventing the overall financial system from vulnerability or systemic risk, while monetary policy may play prudential regulation roles, it is targeted at price stability and ease credit availability by banks.

Many studies have been conducted regarding banking sector stability macroprudential policy and monetary policy (Anwar et al., 2024; Anwar et al., 2023; Gonzalez, 2022; Bruno et al., 2017), given that some studies examined the effect of monetary policy on banking sector stability or profitability (Uddin, 2020; Lenyie, 2021; Ayomi et al., 2020; Ogbeifun and Akinola, 2020), other studies likewise evaluate the impact of macro-prudential policy on banking sector stability (Jibrin et al., 2020; Altunbas, Binici, & Gambacorta, 2018) and profitability, to the best of our knowledge, no study has been conducted in Nigeria to examined the effect of macroprudential policy and monetary policy and Nigerian banking sector profitability. Hence, this study will contribute to the existing literature by exploring the impact of both macroprudential and monetary policy on the profitability of the banking sector in Nigeria.

Literature Review

The literature entails the conceptual review of the topic concepts, empirical review and gap in the literature,

Macro-prudential Policy and Monetary Policy: Complimentary rather than Substitute

Macroprudential policy refers to the application of prudential tools to detect and mitigate financial vulnerabilities and systemic risks which assist in reducing economic costs that may emerge from unstable financial systems where banks are major entities (Jibrin et al., 2020). "macro-prudential policies are designed to identify and mitigate risks to systemic stability, in turn reducing the cost to the economy from a disruption in financial services that underpin the workings of financial markets - such as the provision of credit, but also of insurance and payment and settlement services" (FSB/IMF/BIS, 2009). On the other hand, CBN (2006) defined monetary policy as a combination of various which are directed towards achieving price stability within the purview of achieving economic growth and financial stability. Banks are profitable because they operate in a financial system where either or both momentary policy and macro-prudential policy are well in place to militate against all forms of risk.

As earlier introduced, there is an existing paradigm on the roles of macroprudential and monetary policy towards an effective financial system which aids banks' profitability. Researchers such as Chen et al., (2017) established that monetary policy influences the banking sector independently and can provide the needed regulations to curb crises bedevilling the financial system. Stein (2012) tends to lean towards the direction that monetary policy tools in certain situations can be used to attain not just price stability to financial stability. This implies that monetary policy macroprudential policy can serve as a substitute in the race to achieve financial stability.

Furthermore, macroprudential policy and monetary policy do have spillover or mitigating effects on each other. Macroprudential policy measures impact credit growth, which can, in turn, affect overall demand, economic growth, and inflation (Belkhir et al., 2023). Additionally, these

measures influence banks' incentives, potentially altering how interest rates affect the economy. Cozzi et al. (2020) demonstrate that when capital requirements are high and the financial system is less leveraged, the economy becomes less sensitive to monetary policy. In his examination of macroprudential policy intervention in low-interest-rate economies, Van der Ghote (2020) finds that stricter macroprudential policy reduces the natural real rate. This equilibrium risk-free rate aligns with target inflation and potential output, achieved by decreasing financial stability risks. Conversely, monetary policy affects the degree to which macroprudential policy measures influence the real economy. Changes in interest rates can modify banks' risk-taking behaviours, which may lead to adjustments in the optimal approach to macroprudential policy (Belkhir et al., 2023). Laeven, Maddaloni and Mendicino (2022) critics that the extent to which monetary policy is accommodative is crucial in determining the short-term effects of macroprudential policy and, consequently, the scope of macroprudential policy. Mendicino et al. (2020) contend that while higher capital requirements enhance bank safety and provide long-term benefits, they incur short-term costs by reducing the credit supply and aggregate demand. This implies that an accommodative monetary policy is essential to smother tight macroprudential costs.

More so, some literature such as Altavilla, Canova, and Ciccarelli (2020) has segregated the roles of monetary and macroprudential policies which suggests that they are more complementary and should work in coordination. Smets (2014) summarized that "the monetary authority should keep its relatively narrow mandate of price stability and stabilizing resource utilization around a sustainable level, whereas macroprudential authorities should pursue financial stability, with each having their instruments". As such, Monetary and macroprudential policies can complement each other when they influence aggregate demand in the same direction, working towards both price and financial stability (Kim and Mehrotra 2018; Rubio and Yao 2020). For instance, Choi and Cook (2018) identify complementarities between these policies in most inflation-targeting (IT) countries. Their findings show that macroprudential tightening (or easing) often aligns with controlling

excessive credit growth when inflation is below target (or mitigating constrained credit when inflation is above target), as indicated by the estimation of macroprudential policy reaction regressions. Hence, this study will examine the combination of monetary and macro-prudential policies on the performance of Nigerian banks.

Empirical Review

Various studies have been conducted either using both monetary and macro-prudential policies on the banking sector or looking into each policy to determine the stability or profitability of the banking sector. Anwar et al. (2023) evaluated the macro-prudential policy effect on financial system stability among 20 emerging economies and found that stringent prudential policies improve banks' stability. Nakatani (2020) established that macroprudential policies reduce the possibility of banking risk using 65 countries for the period, 2000 to 2016. Gonzalez (2022), and Ali and Iness (2020) found that macroprudential policies are paramount towards achieving a stable financial system. Davis et al. (2022) examined the macroprudential effect on banks profitability using global banks from 1990 to 2018 and found that the policy effect on banks' profitability varies across countries, banks and periods. The macro-prudential policy has an adverse effect on the profitability of small but well-capitalized banks than less capitalized but larger banks. Thus findings were similar to that of Altunbas et al. (2017) which examined 61 advanced and emerging economies banks Jibrin et al. (2020) using quarterly data from 2007 to 2018 found that macro-prudential policies (asset quantity, liquidity, and capital adequacy) effectively interaction with banking sector stability in Nigeria. Using bank-level data from 45 countries, Belkhir et al. (2023) established that the tightening of most macro-prudential tools including DSTI and LTV limits, and capital requirements reduces bank systemic risk further under inflation targeting.

Using both monetary and macro-prudential policies, Anwar et al. (2024) used the banking industry in Indonesian to assess the effect of monetary and macroprudential policies on risk-taking behaviour and found that central bank rate and macroprudential policy has a positive impact on bank Z-score. Aikman et al. (2023) explore monetary policy and

macroprudential policy interaction on financial stability and conclude that both policies are substitutes that have divergence impact on financial stability. Martinez-Miera and Repullo (2019) found that both policies are essential to maintain a stable financial system but macro-prudential policy is more effective in achieving higher social welfare and financial stability. Jiang et al. (2019) used the banking sector in China to examine the coordination of monetary and macroprudential policies on risk-taking and found that both policies should be complementarily used as a countercyclical regulation. Bruno, Shim, and Shin (2017) study of 12 Asia-Pacific countries found that macroprudential policies when complemented with monetary policy can tame credit growth as a result of monetary tightening.

Studies such as Ayomi et al. (2021) examined the effect of monetary policy on the bank's credit fault and found that rising interest rate has a negative impact on the rise of credit default thus monetary policy ensures bank stability. Dang (2020), Boungou (2020), and Bran et al. (2019) in their respective studies found that banks' risk-taking is reduced by monetary policy. Boungou (2020) found that risk-taking is lower in countries with negative interest rates; Bran et al. (2019) and Dang (2020) established that lower interest rate and high liquidity by banks reduces bank risk. Urukpa (2019) found that the cash reserve ratio and liquidity ratio have a negative relationship while the monetary policy rate has a positive relationship with banks' performance in Nigeria, as this was agreed with the findings Lenyie (2021) and Agbadua and Ezu (2024), it was contrary to study of Okheshimi (2020) and Bamidel et al. (2015) that found negative relationship between monetary policy rate and banks soundness in Nigeria. Agha, Oluyombo and Aworinde (2023) and Alalade et al. (2020) found that monetary policy through liquidity ratio, and loan/deposit ratio has a positive impact on the performance of deposit money banks in Nigeria. Adesina, Nwidobie and Amadi (2018) found an insignificant long-run relationship between monetary policies and deposit money banks' performance in Nigeria.

Methodology

Model Specification

Similar to the study of Davis et al. (2022) where the dependent variables were Return on Assets (ROA) and Return on Equity (ROE) which were regressed with independent variables of macroprudential policy using about 6010 global banks, this study will use monetary and macroprudential policies to determine the banking sectors performance in Nigeria. Econometrically, the model for this study is as follows:

ROA/ROE = f (RCRWA, NPLPC, LIQTA, LIQSL NPLR, MPR, EXCR, M2) ……………… (1)

$$ROA/ROE_t = \alpha + \beta_1 RCRWA_t + \beta_2 NPLPC_t + \beta_2 NPLR_t + \beta_3 LIQTA_t + \beta_4 LIQSL_t + \beta_5 MPR_t + \beta_6 EXCR_t + \beta_7 lnM2_t + \varepsilon_t$$
……………………………………………..…………………………………………..(2)

Table 1: Variables Description

Variables/Symbols	Descriptions	Measurement/ Policy	Apriori Expectations	Sources of Data
Return in Assets (ROA) or Return on Equity (ROE)	ROA indicates efficiency in utilizing assets, while ROE indicates efficiency in utilizing banks capital.	Banks Performance Macroprudential policy		International Monetary Fund, Central Bank of Nigeria
Regulatory Capital to Risk-Weighted Assets (RCRWA)	The broader measure of capital adequacy which is the strength of banks to get covered against shocks to the balance sheet	Capital Adequacy: Macroprudential policy		International Monetary Fund, Central Bank of Nigeria, World Bank Database
Non-performing Loans Net of Provisions to Capital (NPLPC)	It measures the capacity of banks' capital to withstand	Capital Adequacy: Macroprudential policy		International Monetary Fund, Central Bank of

			Nigeria, World Bank Database
	losses from nonperforming loans		
Nonperforming Loans to Total Gross Loans (NPLR)	It measures the quality of assets or loan advances	Asset Quality: Macroprudential policy	International Monetary Fund, Central Bank of Nigeria, World Bank Database
Liquid Assets to Total Assets (LIQTA)		Liquidity: Macroprudential policy	International Monetary Fund, Central Bank of Nigeria, World Bank Database
Liquid Assets to Short-term Liabilities (LIQSL)	This indicates the potentiality of banks to meet their obligations in the short term	Liquidity: Macroprudential policy	International Monetary Fund, Central Bank of Nigeria, World Bank Database
Monetary Policy Rates (MPR)	This indicates the benchmark lending rate set by the Monetary authority	Monetary Policy	Central Bank of Nigeria, World Bank Database
Exchange Rate (EXGR)	"Local currency units relative to U.S. dollars"	Monetary Policy	Central Bank of Nigeria, World Bank Database
Money Supply (M2)	"This is narrow money plus savings and time deposits, as well as foreign-denominated deposits"	Monetary Policy	Central Bank of Nigeria, World Bank Database

Source: Author's Computation, (2024)

Research Design and Data Sources

Based on the above, this study utilized an ex post facto research design, appropriate for determining the impact relationship among variables. The data set spanned from the first quarter of 2007 to the fourth quarter of 2023, encompassing the period of full implementation of macro-prudential policies following the global financial crisis of

2007/2008. Additionally, this timeframe saw intensified monetary policy efforts aimed at maintaining a sound, profitable, and stable banking sector.

Data Analysis Technique

The data will be subjected to stationarity tests using the Augmented Dickey-Fuller (ADF) test and the Phillips-Perron test to determine whether the variables have unit roots. The results will be utilized to conduct a co-integration test among the variables to ascertain their long-term relationships. Additionally, stability tests will be performed to ensure the stability of the models. Diagnostic tests, including serial correlation, normality, Ramsey RESET, and heteroskedasticity tests, will be conducted to validate the model's robustness.

Data Presentation, Analysis and Discussion

Unit Root Test

Table 2: ADF and PP Unit Root Result

Variables	ADF Stat. Values	t. Stats	Order of Integration	Philips Perron (PP) Stat. Values		Order of Integration	Remarks
ROA	-3.7439	-3.4827*	I(0)	-3.6645	-3.4828*	I(0)	Stationary
ROE	-5.2573	-3.5421***	I(0)	-4.5980	-3.5384***	I(0)	Stationary
RCRWA	-3.8085	-3.5461***	I(0)	-5.7232	-3.5402***	I(1)	Stationary
NPLPC	-6.4534	-3.5384***	I(0)	-6.4494	-3.5384***	I(0)	Stationary
LIQTA	-7.2399	-4.1157***	1(1)	-7.2254	-4.1130***	1(1)	Stationary
LIQSL	-3.6301	-3.4840**	I(0)	-3.4132	-3.4828**	I(0)	Stationary
NPLR	-4.5233	-4.1213***	I(1)	-8.4245	-4.1130***	I(1)	Stationary
MPR	-7.6809	-4.1184***	I(1)	-3.6967	-3.4828**	I(0)	Stationary
EXGR	-6.7885	-4.1157***	I(1)	-8.6958	-4.1130***	I(1)	Stationary
LnM2	-3.7276	-3.4879**	I(1)	-5.4107	-.41104***	I(0)	Stationary

Source: EViews Output, 2024
Note: *** and ** show significance levels at 1% and 5% respectively.

From Table 1, it was found that the variables were stationary at different levels. Return on Assets (ROA) and Return on Equity (ROE) were both stationary at levels using ADF and PP tests. Regulatory Capital to

Risk-Weighted Assets (RCRWA) was stationary at a level using ADF and at the first difference using PP. Non-performing Loans Net of Provisions to Capital (NPLPC) and Liquid Assets to Short-term Liabilities (LIQSL) were both stationary at a level using ADF and PP tests. More so, Liquid Assets to Total Assets (LIQTA), Nonperforming Loans to Total Gross Loans (NPLR) and Exchange Rate (EXGR) were stationary at first difference using ADF and PP. Lastly, both Monetary Policy Rates (MPR) and Money Supply (LnM2) were stationary at the first difference using the ADF unit root test while stationary at the level using the PP test.

Table 3: ARDL Bound Test Procedure Result

Variable	F-Statistics	Cointegration	Variable	F-Statistics	Cointegration
Return on Assets (ROA)	8.401	Cointegration	Return on Equity (ROE)	12.123	Cointegration
Critical Value	Lower Bound	Upper Bound	Critical Value	Lower Bound	Upper Bound
1%	1.85	2.85	1%	2.62	3.77
5%	2.11	3.15	5%	2.11	3.15
10%	2.62	3.77	10%	1.85	2.85

Source: E-View output (2024).

Table 3 is about the ARDL bound test for cointegration which is used to establish if there exists a long-run relationship between the dependent and independent variables. The bound test is used because the stationarity combinations among the variables were I(0) at the level and I (1) at the first difference. Using both proxies for banking performance in Nigeria ROA and ROE, the F-stat values were (8.401) and (12.123) respectively which were both higher than the upper and lower bound critical values. Hence, this implies that there exists a long-run relationship among the variables that is, macroprudential policy and monetary policy co-integrate with banking sector performance in Nigeria.

Regression Analysis: Error Correction Model for Long Run Cointegration (ARDL)

Table 4: Long-run Estimates results

Variables	Return on Equity (ROE)		Return on Assets (ROA)	
	Coefficient	**t-statistics**	**Coefficient**	**t-statistics**
RCRWA	1.5675***	4.5211	0.2904***	5.1692
NPLPC	0.0587***	5.4016	0.0066***	5.1671
LIQTA	-1.0811**	-2.3146	-0.2124**	-2.5313
LIQSL	0.3381	1.4709	0.0408	1.0057
NPLR	-0.2653***	-3.5872	-0.0452***	-3.4597
MPR	2.2041***	2.9854	0.3278***	3.4120
EXGR	0.1163***	5.6076	0.0192***	4.9444
LnM2	-24.4901***	-4.8734	-5.3114	-6.0740
C	143.7024***	3.6106	34.0932***	4.7592

Source: E-Views Output, 2024
Note: ***,** and * show significance level at 1%, 5% and 10%respectively**.**

Table 4 shows the long-run relationship between the monetary, and macroprudential policies and banking sector performance in Nigeria. For macroprudential policy, Regulatory Capital to Risk-Weighted Assets (RCRWA), Non-performing Loans Net of Provisions to Capital (NPLPC) and Liquid Assets to Short-term Liabilities (LIQSL) have a positive relationship with ROE and ROA except for LIQSL that is not significant. This implies a 1% increase in the Regulatory Capital to Risk-Weighted Assets, Non-performing Loans Net of Provisions to Capital and Liquid Assets to Short-term Liabilities will increase ROE by 1.57%, 0.06% and 0.34% and ROA by 0.29%, 0.006%, and 0.04% respectively in Nigeria banking sector.

More so, Liquid Assets to Total Assets (LIQTA) and Nonperforming Loans to Total Gross Loans (NPLR) have a negative and significant relationship with ROE and ROA. This suggests that a 1% increase in Liquid Assets to Total Assets (LIQTA) and Nonperforming Loans to Total Gross

Loans (NPLR) will cause ROE to reduce by 1.08% and 0.265% and ROA by 0.021% and 0.045% respectively.

For monetary policy tools, in the long run, Exchange Rate (EXGR) and Monetary Policy Rate (MPR) have a positive and significant relationship with ROA and ROE, and Money Supply (M2) has a negative relationship with both ROE and ROA but only significant with ROE and not with ROA. This result means that a 1% increase in the monetary policy rates and Exchange rate will cause the ROE to increase by 2.20% and 0.116%, while the ROA will increase by 0.33% and 0.02% respectively for Nigeria's Banking Sector. Also, a 1% increase in Money Supply (LnM2) will cause ROE and ROA to reduce by 24.49% and 5.31% respectively for Nigeria's Banking Sector.

Table 5: Short-run Estimates results

	Return on Equity (ROE)		Return on Assets (ROA)	
Variables	**Coefficient**	**P-value**	**Coefficient**	**t-statistics**
RCRWA	0.3968	0.000	-0.2389	0.002
NPLPC	-0.0348	0.000	-0.0006	0.190
LIQTA	-0.1492	0.816	0.0722	0.461
LIQSL	-0.2830	0.333	-0.0356	0.446
NPLR	-0.4234	0.005	0.0496	0.021
MPR	-1.9249	0.013	-0.1958	0.046
EXGR	-0.2232	0.001	-0.0344	0.000
LnM2	8.0798	0.404	2.5697	0.016
δECM$_{t-I}$	-1.2252	0.000	-1.0551	0.000

Source: E-Views Output, 2024

Table 5 above reveals the short-run estimates and Error Correction Model for this Study. For Macroprudential policy, using ROE as a proxy for banking sector performance in Nigeria apart from Regulatory Capital to Risk-Weighted Assets (RCRWA) that has positive relationship with ROE, Non-performing Loans Net of Provisions to Capital (NPLPC) and Liquid Assets to Short-term Liabilities (LIQSL), Liquid Assets to Total Assets (LIQTA) and Nonperforming Loans to Total Gross Loans (NPLR) has

negative relationship with ROE. While for ROA as a proxy for banking sector performance in Nigeria, only Liquid Assets to Total Assets (LIQTA) has a positive relationship with ROA, Regulatory Capital to Risk-Weighted Assets (RCRWA), Non-performing Loans Net of Provisions to Capital (NPLPC), Liquid Assets to Short-term Liabilities (LIQSL), Liquid Assets to Total Assets (LIQTA) and Nonperforming Loans to Total Gross Loans (NPLR) that has a negative relationship with ROA.

Monetary policy variables in the short run proxy with Exchange Rate (EXGR) and Monetary Policy Rates (MPR) have a negative and significant relationship with ROE and ROA as a proxy for banking sector performance in Nigeria, while Money Supply (LnM2) has a positive but non-significant relationship ROE and significant positive relationship with ROA as a proxy for banking sector performance in Nigeria.

Lastly, the errors from previous periods will be corrected with a yearly speed of adjustment of -1.22 and -1.055, significant at the 1% level. This indicates that short-run shocks from the previous year causing disequilibrium will be adjusted quarterly at this rate. The 122% and 105% speed of adjustment suggests that the error correction process fluctuates around the long-run values in an oscillatory manner rather than being monotonic (Narayan & Smyth, 2006).

Table 6: Diagnostic Tests for the Study

	Return on Equity (ROE)		Return on Assets (ROA)	
Diagnostic Test	**Coefficient**	**Significance Value**	**Coefficient**	**Significance Value**
R² Adjusted	0.8637	-	0.749	-
BG-LM test	2.686	0.082	0.217	0.884
JB Test	0.225	0.894	1.133	0.568
ARCH Test	0.635	0.534	1.264	0.256
F-statistics	11.60	0.0000***	7.985	0.0000***

Source: E-Views Output, 2024.
Note: ***,** and * show significance level at 1%, 5% and 10% respectively.

Table 6 shows post-estimation tests for this study. The R-squared adjusted for both ROE (0.8637) and ROA (0.749) as a proxy for banking

sector performance in Nigeria suggests that macroprudential policy and monetary policy explain about 86% and 75% of banks performance in Nigeria. In addition, the serial correlation test of (0.082) and (0.884) p-values implies that there is no problem with serial correlation. More so, the Jaque-Bera test for normality results (0.894) and (0.568) p-value means that the errors are normally distributed across the models. Lastly, the ARCH test shows the constant variance of residuals, signifying the absence of heteroskedasticity issues.
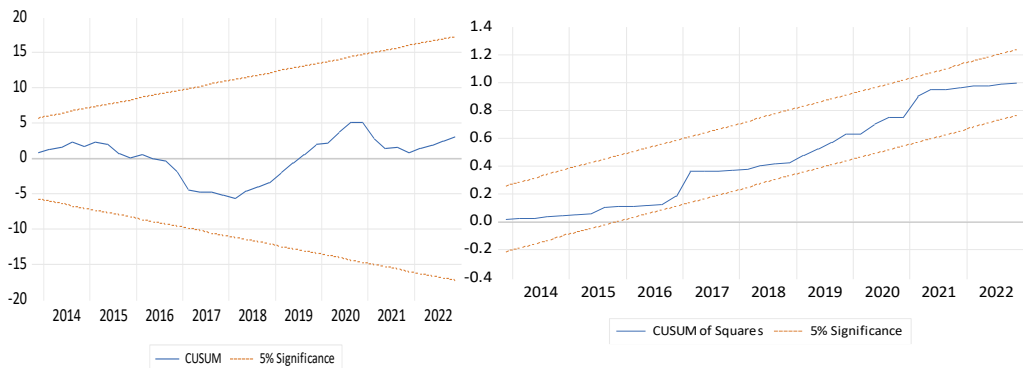
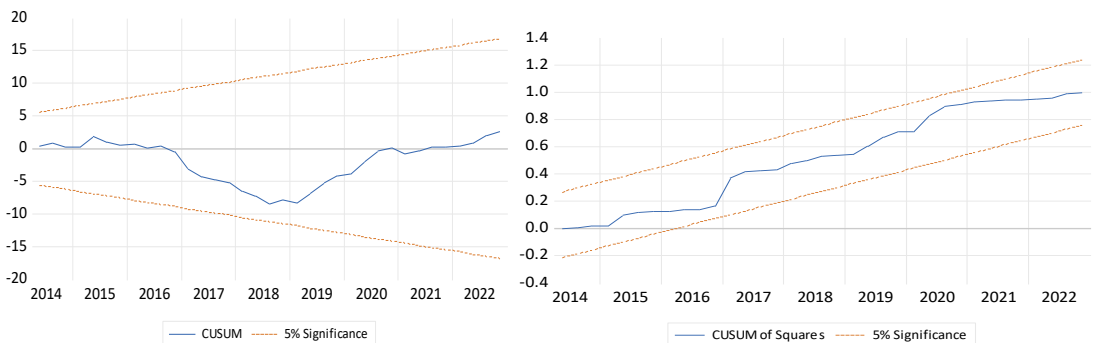Figure 1: CUSUM and CUSUMSQ Plots for Stability Test
of ECM model (ROE)

Figure 2: CUSUM and CUSUMSQ Plots for Stability Test
of ECM model (ROA)

The figures above show the post-estimation test for model stability. The study employed the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) tests. The plots of the variables are within the threshold of 5% which suggests that the coefficients and models of this study were

stable and not misrepresented. Hence, this ensures the reliability of the findings of the study.

Discussion of Findings

From the findings, the macroprudential policy was more effective in the long run in impacting the banking sector performance in Nigeria. Therefore, the long-run relationship between macroprudential policy and bank performance in Nigeria will be discussed and used in the discussion. Capital adequacy proxy with Regulatory Capital to Risk-Weighted Assets (RCRWA), Non-performing Loans Net of Provisions to Capital (NPLPC), and asset quality proxy with on-performing Loan Ratio (NPLR) have an impact on banking sector performance in Nigeria. A well-capitalized banking sector coupled with sound asset quality with a lower non-performing loan ratio means effective utilisation of bank funds for appropriate investments which in turn improves the profitability of the banking sector in Nigeria. This finding agrees with the studies of Belkhir et al. (2023) and Jibrin et al. (2020) that asset quality and capital adequacy have an impact on a bank's profitability through combating risks within the banking sector. However, this is contrary to Davis et al. (2022) findings that Macro-prudential policy has an adverse effect on the profitability of well-capitalized banks.

In terms of liquidity proxy Liquid Assets to Short-term Liabilities (LIQSL) and Liquid Assets to Total Assets (LIQTA) have positive and negative relationships respectively but Liquid Assets to Short-term Liabilities was insignificant to banking sector performance in Nigeria. A highly liquid banking sector means that financial obligations can be met at the right time. This implies that customers' confidence to transact will improve as such improve profitability. This is contrary to the findings of Jibrin et al. (2020), Martinez-Miera and Repullo (2019), Gonzalez (2022), and Ali and Iness (2020) that banking sector liquidity has an effective impact on banking sector stability and soundness. This is contrary to the findings and may be a result of the use of banks' stability while this study used banks' performance.

Furthermore, the findings of this study revealed that monetary policy in the short-run has more effect on banking sector performance in

Nigeria than long-run. In the short run, the monetary policy rate and the exchange rate have a negative impact on the banking sector's performance. Higher exchange rates of borrowing make borrowing difficult for businesses thereby reducing loan advances and higher rates of non-performing loans in the economy. However, a strong currency and lower rate of borrowing improve banks' performance as it encourages loan advancement and low default on loans by borrowers. This finding concurs with studies of Anwar et al. (2024), Ayomi et al. (2021), Brana et al. (2019), Boungou (2020), Dang (2020), Okheshimi (2020) and Bamidel et al. (2015) that found a negative relationship between the monetary policy rate and banks soundness. However, studies by Lenyie (2021), Agbadua and Ezu (2024) and Urukpa (2019) found that monetary policy rate has a positive relationship with banks performance. In addition, Money supply (M2) has a positive and significant relationship with banking sector performance in Nigeria. If there is liquidity in the economy, banks will have savings to invest as loans and for other investments which resulted in an improved bank performance. The studies of Agha et al. (2023), Brana et al. (2019), Dang (2020) and Alalade et al. (2020) were in agreement with the finding that money supply has a positive impact on the banking sector.

Lastly, given that both macroprudential and monetary policies have an effective relationship with banking sector performance, it is said that both policies are complementary and not substitutes because maintaining a sound and profitable banking sector will require the presence and effectiveness of both policies. As such, both policies are complementary rather than substitute. This agrees with the studies of Anwar et al. (2024), Jiang et al. (2019), Bruno et al. (2017), Choi and Cook (2018), Kim and Mehrotra (2018) and Rubio and Yao (2020) and that both policies should be complementarily used as a countercyclical regulation to improve banking sector stability, soundness and performance.

Conclusion and Recommendations

From the study findings, it is established and concluded that monetary policy is more effective in the short –run to tackle banking sector risks in other to improve their performance than macro-prudential policy. On the other hand, macroprudential policy in the long run has an

impact on banking sector performance in Nigeria. Therefore, both monetary policy and macro-prudential policy complement each other in curbing various risks that will affect banking sector profitability in Nigeria. While monetary policy is required for optimal coordination of the banking sector at regular intervals, the acro-prudential policy is essential for the long-term sustainability and succession of the banking sector in Nigeria. It is therefore recommended that the monetary authority implement monetary policy measures to effectively manage short-term risks and ensure regular coordination within the banking sector because it involves adjusting interest rates, managing the exchange rate, and regulating money supply to stabilize the financial environment. Such measures help maintain immediate stability, enhance liquidity, and improve profitability in the short run and long run as well for the banking sector. In addition, macro-prudential policy is essential for long-term sustainability and resilience because it focuses on mitigating systemic risks, improving the sector's ability to withstand financial shocks, and ensuring the overall stability of the financial system. By addressing structural vulnerabilities and enhancing regulatory frameworks, macro-prudential policy supports the sustained success and health of the banking sector over the long term specifically and short run as well. Hence, by combining these two approaches, Nigeria can achieve both immediate improvements and long-term stability in its banking sector.

References

Adesina, J. B., Nwidobie, M. B., & Amadi, A. N. (2018). Monetary policy and financial performance of Nigerian deposit money banks. *Asian Economic and Financial Review*, *8*(7), 853.

Agbadua, O. B., & Ezu, G. K. (2024). Effect Of Monetary Policy Rate On Performance Of Selected Quoted Deposit Money Banks In Nigeria. *African Journal of Business and Economic Development*, *4*(1), 76-93.

Agha, E., Oluyombo, O., & Aworinde, O. (2023). Bank Governance, Asset Quality, and Risk. Do Macro-Prudential Policy and Macroeconomic Factors Matter? Evidence from Nigeria's Banking Sector. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, *8*(8), 47.

Aikman, D., Giese, J., Kapadia, S., & McLeay, M. (2023). Targeting Financial

Stability: Macroprudential or Monetary Policy?. *International Journal of Central Banking*, *19*(1), 159-242.

Akinci, O., & Olmstead-Rumsey, J. (2018). How effective are macroprudential policies? An empirical investigation. *Journal of Financial Intermediation*, *33*, 33-57.

Alalade, Y. S., Oseni, E., & Adekunle, O. A. (2020). Monetary policy and financial performance of deposit money banks in Nigeria. *Asian Social Science*, *16*(11), 123.

Ali, M., & Iness, A. (2020). Capital inflows and bank stability around the financial crisis: the mitigating role of macro-prudential policies. *Journal of International Financial Markets, Institutions and Money*, *69*, 101254.

Altavilla, C., Canova, F., & Ciccarelli, M. (2020). Mending the broken link: Heterogeneous bank lending rates and monetary policy pass-through. *Journal of Monetary Economics*, *110*, 81-98.

Altunbas, Y., Binici, M., & Gambacorta, L. (2018). Macroprudential policy and bank risk. *Journal of International Money and Finance*, *81*, 203-220.

Anwar, C. J., Okot, N., Suhendra, I., Indriyani, D., & Jie, F. (2024). Monetary policy, macroprudential policy, and bank risk-taking behaviour in the Indonesian banking industry. *Journal of Applied Economics*, *27*(1), 2295732.

Anwar, C. J., Hall, S. G., Harb, N., Suhendra, I., Purwanda, E., & Khan, M. K. (2023). Evaluation of central bank independence, macroprudential policy, and credit gap in developing countries. PLoS One, 18(5), e0285800.

Ayomi, S., Sofilda, E., Hamzah, M., & Ginting, A. (2021). The impact of monetary policy and bank competition on banking industry risk: *A default analysis. Banks and Bank Systems, 16*(1), 205–215. https://doi.org/10.21511/bbs.16(1).2021.18

Boungou, W. (2020). Negative interest rates policy and banks' risk-taking: Empirical evidence. *Economics Letters*, *186*, 108760.

Brana, S., Campmas, A., & Lapteacru, I. (2019). (Un) conventional monetary policy and bank risk-taking: *A nonlinear relationship. Economic Modelling, 81*, 576–593. https://doi.org/10.1016/j.econmod.2018.07.005

Belkhir, M., Naceur, S. B., Candelon, B., Choi, W. G., & Mugrabi, F. (2023). *Macroprudential Policy and Bank Systemic Risk: Does Inflation Targeting Matter?*. International Monetary Fund, EMEA 2023. Retrieved May 31, 2024, from: https://dx.doi.org/10.2139/ssrn.4726403

Bruno, V., Shim, I., & Shin, H. S. (2017). Comparative assessment of macroprudential policies. *Journal of Financial Stability*, *28*, 183-202.

Central Bank of Nigeria ([CBN], 2021). Annual Economic Report, 2021. Retrieved May 28, 2024, from: https://www.cbn.gov.ng/out/2022/rsd/ecr%25202021q4.pdf

Central Bank of Nigeria ([CBN], 2016). An Econometric Analysis Of The Impact Of Macro-Prudential Instruments On The Nigerian Economy, Research Department Central Bank of Nigeria, Retreived June 02, 2024, from: https://www.cbn.gov.ng/out/2017/rsd/an%2520econometric%2520analysis%2520of%2520the.pdf

Central Bank of Nigeria ([CBN], 2006). Monetary Policy Series CBN/MPD/Series/01/2006. Retreived June 02, 2024, from: https://www.cbn.gov.ng/out/eduseries/series1.pdf

Chen, M., Wu, J., Jeon, B. N., & Wang, R. (2017). Monetary policy and bank risk-taking: Evidence from emerging economies. *Emerging Markets Review*, 31, 116–140.

Choi, W. G., & Cook, M. D. (2018). *Policy conflicts and inflation targeting: the role of credit markets*. International Monetary Fund IMF Working Paper No. 2018/072

Cozzi, G., Darracq Paries, M., Karadi, P., Körner, J., Kok, C., Mazelis, F., Nikolov, K., Rancoita, E., Van der Ghote, A., & Weber, J. (2020). *Macro prudential Policy Measures: Macroeconomic Impact and Interaction With Monetary Policy*. ECB Working Paper No. 2376. Retreived June 02, 2024, from: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2376%7E7e9a0cae47.en.pdf

Dang, V. D. (2020). The conditioning role of performance on the bank risk-taking channel of monetary policy: Evidence from a multiple-tool regime. *Research in International Business and Finance*, 54, 101301.

E. P., Karim, D., & Noel, D. (2020). *Macroprudential policy, monetary policy*

and the bank interest rate margin. National Institute of Economic and Social Research NIESR Discussion Paper No. 515, London.

Financial Stability Board (FSB)/International Monetary Fund (IMF)/Bank for International Settlement (BIS) (2009). Report to G20 Fnance ministers and governors: Guidance to assess the systemic importance of Financial Institutions. Retrieved From: https://www.bis.org/publ/othp07.pdf

González, F. (2022). Macroprudential policies and bank competition: International bank-level evidence. *Journal of Financial Stability*, 58, 100967.

Jiang, Y., Li, C., Zhang, J., & Zhou, X. (2019). Financial stability and sustainability under the coordination of monetary policy and macroprudential policy: New evidence from China. *Sustainability, 11*(6), 1616.

Jibrin, Y., Adegbe, B., & Ogbonnaya-Orji, N. (2020). Macroprudential policy and the banking system stability in Nigeria. *Economic and Financial Review*, *58*(3), 1-33.

Kim, S., & Mehrotra, A. (2018). Effects of monetary and macroprudential policies—evidence from four inflation targeting economies. *Journal of Money, Credit and Banking*, *50*(5), 967-992.

Laeven, L., Maddaloni, A., & Mendicino, C. (2022). *Monetary policy, macroprudential policy and financial stability*. ECB Working Paper Series No 2647

Lenyie, L. (2021). Macro Prudential Stress Test of Monetary Policy and Assets Quality of Commercial Banks in Nigeria. *International Journal of Innovative Finance and Economics Research 9*(2), 101-116

Martinez-Miera, D., & Repullo, R. (2019). Monetary policy, macroprudential policy, and financial stability. *Annual Review of Economics*, *11*, 809-832.

Mendicino, C., Nikolov, K., Suarez, J., & Supera, D. (2020). Bank capital in the short and in the long run. *Journal of Monetary Economics*, *115*, 64-79.

Nakatani, R. (2020). Macroprudential policy and the probability of a banking crisis. *Journal of Policy Modeling, 42*(6), 1169–1186. https://doi.org/10.1016/j.jpolmod.2020.05.007

Narayan, P. K., & Smyth, R. (2006). What determines migration flows from low-income to high-income countries? An empirical investigation of Fiji–Us migration 1972–2001. *Contemporary economic policy*, *24*(2), 332-342.

Ogbeifun, I. E., & Akinola, A. O. (2019). Impact of qualitative monetary policy on performance of deposit money banks in Nigeria. *International Journal of Development Research*, *9*(7), 28833-28840.

Okheshimi, E. N. (2020). Monetary policy and commercial banks assets quality in nigeria: panel data analysis. *American international journal of economics and finance research*, *2*(1), 54-71.

Rubio, M., & Yao, F. (2020). Macroprudential policies in a low interest rate environment. *Journal of Money, Credit and Banking*, *52*(6), 1565-1591.

Smets, F. (2014). Financial stability and monetary policy: How closely interlinked? *International Journal of Central Banking, 10(*2), 263-300.

Stein, J. C. (2012). Monetary policy as financial stability regulation. *The Quarterly Journal of Economics*, *127*(1), 57-95.

Uddin, G. (2020). *Prudential guidelines and financial system stability in Nigeria*. Munich Personal RePEc Archive. MPRA, Paper No. 104964 Retreived June 02, 2024, from: https://mpra.ub.uni-muenchen.de/104964

Uruakpa, P. C. (2019). Impact of monetary policy on deposit money banks' performance: The case of Nigeria. *Journal of Finance, Banking and Investment*, *5*(1), 81-106.

Van der Ghote, A. (2020). Benefits of macro-prudential policy in low interest rate environments. ECB Working Paper No. 2498.

World Bank (2022). Bank's Return on Equity for Nigeria [DDEI06NGA156NWDB]. Retreived June 04, 2024, from: https://datacatalog.worldbank.org/search/dataset/0038648