

## Macroprudential Policy Framework and Banking Sector Stability in Nigeria

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ARTICLE INFORMATION	ABSTRACT
<p><b>Article history:</b>            Published on 23<sup>rd</sup> Jan 2026</p> <p><b>Keywords:</b>            Macroprudential policy            Framework            Debt-to-Income            Loan-to-value            Liquidity coverage ratio            Return on Asset</p>	<p>The purpose of this study is to examine the impact of macroprudential policy frameworks on the stability of the banking sector in Nigeria, with Return on Assets (ROA) serving as a proxy for banking stability. The study specifically investigates the influence of Debt-to-Income (DTI), Loan-to-Value (LTV), and Liquidity Coverage Ratio (LCR) on ROA. Employing an ex-post facto research design, the study utilizes secondary time series data covering the period from 1990 to 2023, sourced from the Central Bank of Nigeria. Descriptive statistics, pre-estimation diagnostic tests, and inferential analysis using the Ordinary Least Squares (OLS) regression method were applied to examine the relationship between the selected macroprudential indicators and banking sector performance. The results revealed that DTI has a significant negative impact on ROA, indicating that excessive debt levels diminish bank profitability. However, both LTV and LCR were found to have no significant effect on ROA, suggesting limited influence of these tools on bank performance in the Nigerian context. The study concludes that not all macroprudential instruments equally influence banking stability and that policy effectiveness may depend on implementation and contextual factors. It recommends that regulatory authorities, particularly the Central Bank of Nigeria, should enforce stricter debt exposure limits, revise LTV thresholds in line with market realities, and strengthen compliance with liquidity coverage requirements to improve financial resilience.</p>

### 1. Introduction

Traditional microprudential supervision, which centred on the stability of individual financial institutions, proved inadequate in protecting the global financial system as a whole during the 2007–2009 global financial crisis (Constancio, 2017). A regulatory framework known as macroprudential policy was put in place to deal with systemic risks that pose a broader danger to financial stability as a result of this weakness (Galati & Moessner, 2013; Claessens, Ghosh & Mihet, 2014). Rising to prominence as its own area of financial regulation, macroprudential policy seeks to ensure a stable financial system by preventing systemic risks like asset bubbles, excessive credit growth, and liquidity mismatches (Lim, Columba, Costa, Kongsamut, Otani, Saiyid, Wezel, & Wu 2011; IMF, 2013). The Bank of England (2009), the European Central Bank (2010), the International Monetary Fund (2010), and the Swiss National Bank (2010) are among the international regulatory organisations that have stated that macroprudential regulation is necessary to address the structural and cyclical aspects of systemic risk, in addition to microprudential tools and monetary policy.

As a result of these worldwide changes, macroprudential policies have been included into Nigeria's financial regulatory structure in order to enhance systemic resilience. To curb credit booms and forestall the creation of financial bubbles, the Central Bank of Nigeria (CBN) implemented measures such as the countercyclical capital buffer, the loan-to-deposit ratio (LDR), and credit exposure limits to critical sectors (CBN Financial Stability Report, 2023). Key financial soundness indicators, which the CBN uses to keep an eye on the system, fall into three categories: asset-based, capital-based, and income-and-expense-based measures (Muo, 2012). Regulatory capital to risk-weighted assets, the ratio of liquid assets to short-term obligations, and the percentage of non-performing loans to total loans are just a few examples. In times of economic growth, these instruments assist keep systemic risks from becoming worse, while in times of recession, they allow credit to flow by functioning as built-in stabilisers (Edge & Liang, 2020; IMF, 2014). The goal of limiting wide-scale disruptions in financial services, the system-wide analytical scope focussing on interconnections across institutions and markets, and the targeted use of prudential tools to counter systemic risk are the three pillars upon which macroprudential policy is based, as emphasised by the IMF, BIS, and FSB (Lim et al., 2011). The Financial Stability Reference Unit of the Central Bank of Nigeria (CBN) puts these ideas into practice by assessing the effectiveness of macroprudential policies using a range of soundness indicators. In the end, macroprudential policy is a planned and proactive reaction to the shortcomings of microprudential supervision; its goal is to strengthen the stability of the financial

system by preventing major economic disruptions caused by risks that weren't managed beforehand (Samuel, Anne, Irene & Camilla, 2021).

### 1.1 Statement of the Problem

In developing economies like Nigeria's, where banks are vital for allocating capital and providing financial services, a stable banking sector is essential to economic development. Systemic risks persist in Nigeria's banking industry despite many regulatory changes, including as the consolidation of 2004 and the implementation of risk-based supervision and enhanced governance frameworks. There are worries regarding the sector's resilience due to recurring volatility, significant non-performing loans, poor capital buffers, and inadequate risk management (Sanusi, 2010; CBN, 2010). Credit concentration, sensitivity to currency fluctuations, oil price volatility, and inflation are some of the structural concerns that have not gone away (IMF, 2021; Uchenna & Oduh, 2015).

Although capital adequacy and liquidity ratios, which are considered conventional measures, indicate a relative soundness, there are still underlying weaknesses. For example, economic variations are exacerbated by banks' procyclical lending practices, which include extending credit during booms and reducing during downturns (Claessens, Ghosh & Mihet, 2013). The probability of systemic contagion is further increased by the interconnection of institutions and the fact that they are all vulnerable to the same risks. Alongside microprudential regulation, macroprudential policy has grown in importance in this setting for addressing systemic risks and making the financial system more resilient.

To rein in unsustainable credit expansion and fortify financial stability, measures such as the Liquidity Coverage Ratio (LCR), the Loan-to-Value Ratio (LTVR), and the Countercyclical Capital Buffer (CCB) have been implemented on a global scale (BIS, 2016; IMF, 2019). Although the Central Bank has started using certain instruments that are in line with Basel III, Nigeria's macroprudential framework is still in its early stages, and there isn't a lot of data on how well these tools operate in Nigeria (CBN, 2022; Olokoyo, Osabuohien, Salami, & Salami, 2020). Uchenna & Uche (2020) and the World Bank (2023) point out persistent difficulties such as regulatory overlap, data limitations, and inadequate institutional capacity, whereas Akinwunmi (2021) and Eze & Nwakoby (2022) argue that these tools have bolstered the sector. Research on the efficacy of macroprudential measures in bolstering banking stability is lacking in the current literature, which is mostly concerned with policy frameworks or design (Kama et al., 2013; Jibrin et al., 2020). In their limited scope, empirical evaluations of macroprudential instruments for banking stability have largely focused on two of the five options available to rein in excessive loan expansion and fortify the financial stability of the banking sector. Beyond what has been done, more examination of these macroprudential instruments in the Nigerian context is necessary in light of the present macroeconomic issues, such as high inflation, currency rate volatility, and post-pandemic recovery. Therefore, the purpose of this research is to determine how stable Nigeria's banking system is and how much of a deficit there is in the country's macroprudential regulatory framework.

### 1.2 Aims and Objectives of the Study

The fundamental goal of this research is to find out how different macroprudential policy frameworks affected the security of Nigeria's banking system.

Study goals include, but are not limited to;

- i. Examine the Impact of Debt-to-Income (DTI) on Return on Assets in the Nigerian banking sector.
- ii. To evaluate the extent to which the Loan-to-Value Ratios (LVR) impacts return on assets in the Nigerian banking sector.
- iii. To evaluate the extent to which the Liquidity Coverage Ratio (LCR) impacts return on assets in the Nigerian banking sector.

## 2.1 Literature Review

### 2.1 Macroprudential Policy Framework

Following the GFC of 2007–2009, the macroprudential policy framework became an essential tool for preserving the stability of the financial system. Financial regulatory frameworks such as macro-prudential policy and monetary policy were both heavily used in the wake of the global financial crisis of 2007–2008 to mitigate the impact of the crisis on banks and their ability to make a profit and expand (Aikman, Giese, Kapadia, & McLeay, 2023; Aliyu, Eliphus, Imam, & Adili, 2024).

Prior to the crisis, microprudential policies which sought to ensure the stability of specific financial institutions were the main emphasis of financial regulation. The need for a framework to protect the entire financial system from potential crises prompted the development of macroprudential policy, which is a step up from microprudential regulation (Borio, 2011; Claessens, Ghosh, & Mihet, 2013).

Nevertheless, due to the worldwide effects of financial crises, particularly those that occurred in 2007 and 2008, macro-prudential policy has been fully implemented. This policy offers stricter regulation in order to maintain the stability, soundness, and safety of the financial system (Jibrin, Adegbe, & Ogbonnaya, 2020; Aliyu et al., 2024). A more comprehensive risk assessment system that accounts for local and international institutions and markets with related risks is necessary since this crisis exposed the inadequacy of monetary policy rules. Capital adequacy, asset quality, and liquidity are only a few of the prudential laws that are part of macro-prudential policy's efforts to stabilise the financial system overall. This information is sourced from Aliyu et al. (2024).

### 2.2 Debt-to-Income (DTI) Ratios

One of the most important metrics used in micro and macroprudential control is the debt-to-income ratio (DTI). Essentially, DTI is just a way to see how much of a borrower's income goes towards paying down their debt. Lenders and regulators use it to gauge borrowers' capacity to repay loans and safeguard families from getting into excessive debt. The DTI ratio has been reintroduced as a measure for consumer protection and financial system stability in the wake of the COVID-19 shock and the 2007–2009 financial crisis. A notable change in the literature is the reinterpretation of DTI as a macroprudential measure in addition to a tool for

determining the affordability of loans. Mortgage defaults during the past crisis were strongly predicted by borrowers with high DTI levels, according to a comprehensive analysis spanning Euro area nations conducted by Kelly, Le Blanc, and Lydon (2019). Specifically during economic booms, they said, DTI limitations might "lean against" the expansion of lending too far. In a similar vein, Zhang and Zoli's (2020) IMF research highlighted the importance of DTI restrictions in preventing housing bubbles, especially in developing economies where property credit grows rapidly alongside economic expansion. restrictions should be introduced early and consistently to address this problem.

### 2.3 Loan-to-Value Ratios (LVR)

When it comes to controlling risks associated with mortgage lending and the real estate market, the Loan-to-Value Ratio (LVR) is a highly utilised macroprudential measure. Put another way, it's a way to see how much of a property's worth is going towards paying down the debt. As an example, your LVR would be 80% if you borrowed ₦8 million to purchase a property worth ₦10 million. In terms of macroprudential policy, LVR is crucial because it establishes a direct restriction on the amount that individuals may borrow in proportion to the value of their houses. This ensures that banks and borrowers are better protected against dropping property values in bad times and helps calm down overheated real estate markets in good times. A substantial amount of recent research emphasises the LVR's efficacy in mitigating housing market systemic risk. The first study was done by Crowe, Dell'Ariccia, Igan, & Rabanal (2013), who demonstrated how the US, Ireland, and Spain had housing bubbles pre-crisis due to weak LVR regulations. Since then, several nations have taken steps to reduce LVR restrictions, particularly in cases when income growth outpaces property price increases.

### 2.4 Liquidity Coverage Ratio (LCR)

Following the worldwide financial crisis of 2008, the Basel III rules established the Liquidity Coverage Ratio (LCR) as a crucial instrument. It is based on the strong but simple principle that financial institutions should have sufficient high-quality liquid assets (HQLA) to weather a 30-day financial storm. Put simply, a bank shouldn't fall prey to a temporary panic, even in the event that financing becomes scarce. The LCR has been the centre of interest for academics, central banks, and regulators ever since its introduction. There are benefits and drawbacks to every rule, and as we'll see, most recent studies agree that the LCR has improved bank safety. Several studies examined the LCR's potential to avert bank runs and liquidity crises similar to the ones that befell Lehman Brothers shortly after Basel III was implemented. During times of uncertainty, Bonner and Eijffinger (2016) discovered that banks with greater LCRs had less financing stress and less outflows, based on data from European banks. They came to the conclusion that the LCR boosts confidence in the financial system since it shows that banks are ready for unexpected events. Similarly, research by Balasubramanyan and VanHoose (2017) on the actions of US banks indicated that those banks that had larger LCR buffers were better able to withstand shocks and needed less liquidity from the federal reserve. Their findings provide credence to the theory that the LCR has prompted financial institutions to forego high-risk, short-term loans.

### 2.5 Banking Sector Stability

Stability in the banking system is defined as the absence of systemic risk caused by inefficient, inconsistent, or otherwise unstable bank operations (Demirguc-Kunt & Detragiache, 2002; Peter, 2025). Stability in the banking system is essential for the smooth operation of financial intermediation, which includes saving mobilisation, lending, risk management, and payment system facilitation (Peter, 2025). Because systemic risks may have far-reaching socioeconomic effects when the financial sector is unstable, macroeconomic stability cannot exist without stable banks. In 2025, Lucketta and Peter published their findings. After the worldwide financial crisis of 2007–2009 revealed serious weaknesses in financial institutions in developed nations, the significance of stable banking has increased. The reaction from regulatory agencies throughout the world was to underscore the need of better crisis management systems, stress testing, and supervision. Stricter capital requirements were imposed under the Basel III regulatory framework.

### 2.6 Return on Asset (ROA)

As a measure of profitability, return on assets (ROA) reveals the extent to which a bank is able to transform its total assets into profit. If you want to know, "How effectively is this bank utilising its resources to generate profits?" it's a good place to start. Because of the interconnected nature of a bank's physical and financial assets, return on assets (ROA) is a common metric for evaluating the institution's performance.

Return on Assets (ROA) measures efficiency, profitability, and income relative to total assets. It is a way for management to see how much money they are making out of all their resources and how well banks are using their liquid assets to make money (Khravish, 2011). The ability of a bank to convert its assets into profit is indicated by its return on assets (ROA), according to Wen (2010). According to Carcello et al. (2000), return on assets (ROA) is a useful metric for assessing how well a company turns its assets into cash. Additionally, it accounts for the bank's size when calculating financial performance, which is a good indicator of a manager's effectiveness in the role as it shows how efficiently the bank is turning its assets into profit. According to Pandey (2009), profit before taxes is the best metric to utilise as it reveals how much money a company made from its sales and other commercial activities, excluding the impact of financing.

## 2.7 Theoretical Framework

### 2.7.1 Systemic Risk Theory

When discussing macroprudential policy, Andrew Crockett's 2000 address at the BIS was a watershed event in defining systemic risk. The formal idea of systemic risk started to obtain solid theoretical grounding in the late 90s and early 2000s, and it really took off during the global financial crisis of 2007–2008. Many people have helped bring this idea to fruition, including Robert

Merton, Zvi Bodie, Andrew Crockett, Markus Brunnermeier, Gary Gorton, and Hyun Song Shin. The interdependence of the financial system and the possibility that its collapse might set off a chain reaction of other collapses is a central tenet of systemic risk theory. Put another way, the theory is based on the premise that the financial system is interdependent, and that problems in one area may affect the whole system, leading to a systemic crisis and widespread instability. Macroprudential regulation, which prioritises system-wide stability above the well-being of specific institutions, is based on this notion.

Banks in Nigeria work together due to interbank markets, similar exposures, and a shared susceptibility to exogenous shocks like changes in oil prices. Theoretically, the theory is pertinent to the research at hand because it provides rationale for the need of macroprudential measures at a time when microprudential attention is primarily focused on managing risks to individual banks. Theoretically, it underpins shock-absorbing and procyclical-reduction techniques like as the Capital Conservation Buffer (CCB), the Countercyclical Capital Buffer (CCyB), and the Systemic Risk Buffer (SRB).

### 2.3 Empirical Review

In order to determine whether the goals of financial stability come at the cost of fair credit allocation, Serena, Keagile, and Ilias (2024) looked at the reaction of South Africa's credit market to macroprudential policy measures, paying special attention to the heterogeneity of borrowers. Using panel and time-series data from 2008 to 2023, we conduct a two-pronged empirical analysis. We find that big enterprises have benefited from macroprudential regulation, which has lowered lending to disadvantaged families. Our research also shows that this rule penalises more creditworthy businesses, which leads to adverse selection by lenders. While Basel III has helped curb careless consumer lending, our findings indicate that the rebalancing of funds has been counterproductive to sustainable development and economic security.

The effects of Nigeria's monetary policy, macroprudential policy, and the efficiency of the banking industry were studied by Aliyu (2024). From the first quarter of 2007 to the fourth quarter of 2022, this study employed secondary data and an ex post facto research approach. Funding for this study came from the World Bank, the Central Bank of Nigeria, and the International Monetary Fund. The data was estimated in the research using ARDL-bound testing and ARDL-ECM. Research into Nigeria's banking industry has shown a strong correlation between macro-prudential policies pertaining to capital adequacy and liquidity (the ratio of liquid assets to short-term liabilities) and sector performance over the long term. Furthermore, there is a negative and statistically significant correlation between the performance of the Nigerian banking system and liquidity (the ratio of liquid assets to total assets) and asset quality. Moreover, monetary policy instruments were more effective in the short run, and there is a positive correlation between Nigeria's banking sector performance and the money supply, as well as a negative and significant relationship between the exchange rate and monetary policy rates. It was determined that monetary policy is more successful in the near term, while macroprudential regulation has a longer-term impact on the performance of Nigeria's banking industry. So, to reduce banking sector risks, the two measures work together rather than against one another.

Using a dynamic agent-based model and the Debt Rank algorithm, Pierre, Shiqiang, and Hairui (2023) examine the robustness of the South African banking sector. Unlike earlier research, which only included listed banks, our method allows us to determine the relative significance and susceptibility of all banks in the interbank network. While bigger banks do have a greater impact on the system as a whole, we do discover a strong correlation between a bank's interbank-lending-to-equity ratio and its susceptibility. As a direct and practical indicator, our study provides policymakers with a tool to better monitor financial stability.

Two such UK policies were investigated by Aakriti, Matthew, and Aniruddha (2023) during COVID-19, an external shock to credit risk, using data from mortgage registries, detailed information on bank capital structures, and healthcare data on case rates. The dynamics of the credit crisis may be alleviated by expansionary macroprudential policy, which supports lending and risk-taking while easing capital limits. The most successful policies, however, are those that address the policy design—for example, reducing the countercyclical capital buffer (CCyB)—and the many frictions that contribute to capital limitations (e.g., regulatory, supervisory, and market signalling).

In the year 2024, Tihana says... Learn more about Growth-at-Risk (GaR) and its use in evaluating macroprudential policies by doing a literature review. Following an overview of the key results and contributions, we zero in on the difficulties that have recently emerged in the literature. Important obstacles include reducing endogeneity problems and accurately measuring the policy variable's intensity. We go over policy endogeneity correction, various data sources, and approaches to quantify the policy's intensity and recommend improvements to these methods. Our analysis comes to a close by outlining potential directions for the development of GaR macroprudential methodology in the future.

A study conducted by Mohamed and Sami (2023) delves into the impact of inflation targeting and other aspects of macroprudential policy on the systemic risk posed by banks. Our findings from regime-dependent dynamic panel regression, which we conducted using bank-level data for 45 countries with different monetary and exchange rate regimes, suggest that monetary and macroprudential policies work together. Under inflation targeting, we find that capital requirements, limitations on DSTI and LTV, and other macroprudential measures further decrease systemic risk for banks. Inflation targeting enhances the functions of macroprudential policy in reducing threats to financial stability, according to our research.

### 3. Methodology

The ex-post facto research approach is used to investigate the cause-and-effect link between the development of Nigeria's banking sector and economic growth. The researcher is unable to influence the variables under study since the data is obtained from reputable sources like the Central Bank of Nigeria. The whole banking industry is included in the study's population. The data collection includes information on liquidity coverage rate (LCR), debt to income (DTI), loan to value (LTV), and return on asset (ROA) from 1990 to 2023. Due to the imperfect availability of all population items, a random sampling approach is employed to choose accessible data points without a specialised subject selection procedure. The research relies on secondary data in the form

of time series, culled from the Statistical Bulletin of the Central Bank of Nigeria and spanning the years 1990–2023. Some examples of secondary data are DTI, LTV, LCR, and ROA numbers. Descriptive and inferential statistics are used in the investigation.

**3.1 Model Specification**

This research lays out the functional link between the following variables: banking sector stability as the dependent variable and macroprudential regulatory framework as the independent variable proxies; liquidity coverage ratio, systemic risk buffer, and loan-to-value.

Here is the econometric model that is derived from the mathematical function:

$$ROA = \alpha_0 + \beta_1 DTI + \beta_2 LCR + \beta_3 LTV + u_i$$

Where;

$\alpha_0$  = Constant;

ROA = Return on Assets

DTI = Debt-to-Income Ratios

LCR = Liquidity Coverage Ratio

LTV = Loan-to-Value Ratios

Where;

B = parameters to be estimated

B0 = intercept constant

B1.....  $\beta_3$  = coefficients (estimate/slope) of the explanatory variables

**4. Findings**

**4.1 Descriptive Results**

	Descriptive Statistics			
	ROA	LTV	LCR	DTI
Mean	1.724118	0.966176	1.325000	0.124118
Median	2.115000	0.885000	1.110000	0.110000
Maximum	4.340000	2.140000	3.510000	0.800000
Minimum	-6.320000	0.040000	1.010000	0.040000
Std. Dev.	1.723202	0.645230	0.572518	0.126326
Skewness	-2.969854	0.319770	2.903979	4.672217
Kurtosis	15.21784	1.892737	10.52417	25.61941
Jarque-Bera	261.4538	2.316312	127.9894	848.5209
Probability	0.000000	0.314065	0.000000	0.000000
Sum	58.62000	32.85000	45.05000	4.220000
Sum Sq. Dev.	97.99102	13.73860	10.81665	0.526624
Observations	34	34	34	34

Source: Extract from E-VIEW 10.0 Output, 2025

Return on Assets (ROA), Loan-to-Value (LTV), Liquidity Coverage Ratio (LCR), and Debt-to-Income (DTI) are the four variables that are summarised in the descriptive statistics table above. The table covers 34 observations. With a range of -6.32 to 4.34 and a standard deviation of 1.72, ROA has significant volatility, with a mean of 1.72. A Jarque-Bera statistic of 261.45 and a p-value of 0.0000 indicate non-normality, further supporting the notion that ROA is extremely negatively skewed (-2.97) and leptokurtic (kurtosis of 15.22), implying frequent extreme low values. The range of LTV is modest, with a mean of 0.97 and a standard deviation of 0.65. The values range from 0.04 to 2.14. Its kurtosis is 1.89 and its distribution is flatter than typical, suggesting a little rightward skew (0.32). A p-value of 0.3141 and a value of 2.32 were produced by the Jarque-Bera test, indicating that the data follows a normal distribution. There are notable outliers on the upper end of LCR, which has a positively skewed distribution with a kurtosis of 10.52 and a mean of 1.33. A non-normal distribution is shown by the Jarque-Bera statistic, which has a p-value of 0.0000 and a value of 127.99. Extreme peaks and lengthy tails are indicated by DTI's strongly right-skewed (4.67) and severely leptokurtic (25.62) properties. The range is rather small, from 0.04 to 0.80, with a mean of just 0.12. With a p-value of 0.0000 and a Jarque-Bera statistic of 848.52, substantial non-normality is confirmed. The data in the table show that whereas LTV seems to follow a normal distribution, the other variables are significantly out of the ordinary because of skewness and kurtosis.

4.2 Unit Root Test

Examining the distributional properties of the data is crucial after descriptive statistics in order to avoid misleading conclusions. For this reason, the researchers in the study used the ADF tests to determine whether the data was stationary. Since trend and intercept were statistically significant when compared to constant and none, we ran the tests with them in mind.

Augmented Dickey Fuller and Phillip-Perron Unit Root Test ADF Stationarity Test

	Level		First Diff		Order of Integration
	Trend and intercept		Trend and intercept		
	t-Stat	Prob	t-Stat	Prob	
ROA	-5.218787	0.0009			I(0)
LTV	-5.360267	0.0006			I(0)
LCR	-4.653684	0.0047			I(0)
DTI	-5.796013	0.0002			I(0)

Source: Author Computation, 2025

Note: \* denotes significant at significance at 5% respectively

The variables are all integrated of order zero, I(0), as shown by the unit root test results given above, which used the Augmented Dickey-Fuller (ADF) technique under the trend and intercept condition. It also shows that all the variables are stationary at level. The specific t-statistics for ROA, LTV, LCR, and DTI are as follows: ROA, -5.755905, -4.653684, 0.0047, and -5.796013, respectively, with a p-value of 0.0009, 0.0002, and 0.0002, respectively. We can rule out the possibility of a unit root in each of the variables as their p-values are all less than the 5% significance threshold. It follows that ROA, LTV, LCR, and DTI are all level and stationary. As a result, we may skip the differencing and cointegration tests and go straight to Ordinary Least Squares (OLS) regression, which are well-suited to level-stationary variables.

Dependent Variable: ROA

Method: Least Squares

Date: 01/13/26 Time: 10:26

Sample: 1990 2023

Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.907774	1.054677	3.705187	0.0009
LTV	-0.027131	0.013349	-2.032426	0.0510
LCR	-0.660791	0.511997	-1.290616	0.2067
DTI	-0.423325	0.094554	-4.477077	0.0000
R-squared	0.549772	Mean dependent var		307.4118
Adjusted R-squared	0.464749	S.D. dependent var		316.2202
S.E. of regression	166.6480	Akaike info criterion		3.969436
Sum squared resid	83.31471	Schwarz criterion		4.149008
Log likelihood	-63.48041	Hannan-Quinn criter.		4.030675
F-statistic	6.761552	Durbin-Watson stat		1.947000
Prob(F-statistic)	0.000000			

4.3 Testing of Hypothesis

H<sub>01</sub>: Debt-to-Income (DTI) ratio has no significant impact on Return on Assets (ROA) in the Nigerian banking sector:

A t-statistic of -4.4771 and a p-value of 0.0000 are shown in the regression output, which indicates that the DTI coefficient is -0.4233. The statistical significance of DTI and its negative relationship to ROA is supported by the fact that the p-value is significantly lower than the 0.05 significance level. According to the data, banks see a decline in return on assets when their debt-to-income ratio rises. Given the variable's high relevance, it suggests that the Nigerian banking system may see a decline in profitability if it relies too much on loan financing. Hence, we find that DTI has a substantial effect on ROA and reject the null hypothesis.

H<sub>02</sub>: Loan-to-Value Ratio (LTV) has no significant impact on Return on Assets in the Nigerian banking sector:

With a p-value of 0.0510 and a t-statistic of -2.0324, the LTV coefficient is -0.0271. At the traditional level of significance, this p-value is borderline, since it is just over the 0.05 threshold. There is insufficient statistical evidence to establish a meaningful impact at the 5% level, even if the finding indicates a negative association between LTV and ROA, indicating that greater loan-to-value ratios may lower profitability. So, LTV does not affect ROA in a statistically meaningful way, and we cannot reject the null hypothesis.

H<sub>03</sub>: Liquidity Coverage Ratio (LCR) has no significant impact on Return on Assets in the Nigerian banking sector:

With a t-statistic of -1.2906 and a p-value of 0.2067, the LCR coefficient is -0.6608. There is no statistical evidence that LCR significantly explains differences in ROA since the p-value is much higher than 0.05. There isn't enough evidence to make firm conclusions, but the negative coefficient suggests that higher liquidity needs would limit profitability. Since we were unable to find evidence to support the null hypothesis, we infer that LCR has no appreciable impact on ROA for Nigerian banks.

#### F-Statistic and Overall Model Significance:

Extremely significant, with a p-value of 0.000000, is the F-statistic of 6.7616. To determine whether the independent factors adequately explain the variance in the dependent variable (ROA), the F-statistic is used. We may say that the model is generally statistically significant since the p-value is significantly lower than 0.05. This indicates that although not all individual variables are statistically significant, the combined effects of DTI, LTV, and LCR provide a substantial explanation for variations in ROA.

#### 4.4 Discussion of Finding

##### Debt-to-Income ratio on Return on Assets:

A t-statistic of -4.4771 and a p-value of 0.0000 are shown in the regression output, which indicates that the DTI coefficient is -0.4233. The statistical significance of DTI and its negative relationship to ROA is supported by the fact that the p-value is significantly lower than the 0.05 significance level. According to the data, banks see a decline in return on assets when their debt-to-income ratio rises. Given the variable's high relevance, it suggests that the Nigerian banking system may see a decline in profitability if it relies too much on loan financing. Hence, we find that DTI has a substantial effect on ROA and reject the null hypothesis.

This result is in line with that of Mohamed et al. (2023), who discovered that reducing systemic risk by tightening macroprudential instruments like DSTI (Debt-Service-to-Income) and LTV ratios implies that financial performance might be undermined by excessive debt exposure. This finding is in line with that of Aliyu (2024), who also discovered a negative correlation between the performance of the Nigerian banking system and asset quality (which is impacted by high borrower debt). On a similar note, Samuel et al. (2021) found that banks are more stable when macroprudential restrictions are in place, which lends indirect credence to the idea that DTI has a detrimental impact on performance..

##### Loan-to-Value Ratio on Return on Assets:

With a p-value of 0.0510 and a t-statistic of -2.0324, the LTV coefficient is -0.0271. At the traditional level of significance, this p-value is borderline, since it is just over the 0.05 threshold. Higher loan-to-value ratios may have a detrimental impact on profitability, according to the conclusion, but the statistical evidence isn't strong enough to demonstrate a substantial effect at the 5% level. So, LTV does not affect ROA in a statistically meaningful way, and we cannot reject the null hypothesis.

However, Mohamed et al. (2023) showed the opposite that LTV limitations mitigate systemic risk, particularly in the context of inflation targeting which suggests that they may be useful in preserving profitability. Although this goes against what Samuel et al. (2021) found, it is in line with their findings that asset-side risk-related liquidity-related macroprudential instruments, such as LTV, failed to improve bank performance in Kenya. Additionally, Serena et al. (2024) noted that LTV and other credit laws unintentionally punished businesses with higher creditworthiness, which might have an adverse effect on bank profits.

##### Liquidity Coverage Ratio on Return on Assets:

With a t-statistic of -1.2906 and a p-value of 0.2067, the LCR coefficient is -0.6608. There is no statistical evidence that LCR significantly explains differences in ROA since the p-value is much higher than 0.05. There isn't enough evidence to make firm conclusions, but the negative coefficient suggests that higher liquidity needs would limit profitability. Since we were unable to find evidence to support the null hypothesis, we infer that LCR has no appreciable impact on ROA for Nigerian banks.

The findings are in line with those of Samuel et al. (2021), who also found that liquidity-related macroprudential regulation failed to improve the credit performance and stability of Kenyan banks. This finding is in line with that of Tihana (2024), who called attention to the difficulty of quantifying the impact of liquidity-based policy instruments and argued that more exact methods are required for evaluating these instruments. But this goes against what Aliyu (2024) found, which suggests that there may be a difference between the short-term and long-term effects of liquidity needs; Aliyu found that liquidity (defined as liquid assets to short-term liabilities) had a positive long-run correlation with bank performance.

## 5. Conclusion and Recommendations

### 5.1 Conclusion

This study looked at how different macroprudential policy frameworks affected the stability of the banking sector in Nigeria. The stability of the banking sector was represented by Return on Assets (ROA), and the macroprudential policy instruments were represented by Liquidity Coverage Ratio (LCR), Loan-to-Value Ratio (LTV), and Debt-to-Income (DTI). Higher debt exposure reduces bank profitability and overall stability, according to the empirical results, which show that DTI has a statistically significant and negative influence on ROA. On the other hand, return on assets (ROA) was unaffected by LTV and LCR, indicating that these regulatory instruments may not have a major impact on Nigerian banks' performance as they are. To enhance Nigeria's banking system, tailored, data-driven policy modifications are needed to increase the efficiency of macroprudential rules. The findings show that not all macroprudential policies have the same or direct impact on bank stability.

### 5.2 Recommendations

- i. The CBN and other regulatory bodies in Nigeria need to encourage prudent lending and impose stronger limitations on debt exposure.

- ii. In order to properly reflect credit risk profiles and market realities, policymakers should reassess the efficacy of the present loan-to-value ratio and make any required adjustments to the ratio.
- iii. The CBN and other relevant parties need to do a better job of enforcing, monitoring, and ensuring compliance with LCR rules. They should also make sure that banks have enough liquid assets to keep running even when finances are tight.

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