



Monetary Policy on Credit Growth of Deposit Money Banks in Nigeria (2010 – 2025)

Ofoama Chukwudi Innocent¹

JIMBA isiaka Kareem²

Akomolehin Francis Olugbenga³✉

^{1,2,3}Dept of Finance, College of Social and Management Sciences, Afe Babalola University, Ado - Ekiti, Nigeria.

(✉ Corresponding Author)

Abstract

This study examines the influence of monetary policy instruments on the growth of deposit money banks' credit to the private sector in Nigeria over the period 2010–2025. Employing annual time-series data sourced from the Central Bank of Nigeria and applying the Autoregressive Distributed Lag (ARDL) bounds testing approach, the study investigates both short-run and long-run dynamics of monetary transmission. The results confirm the existence of a stable long-run relationship between credit growth and selected monetary policy variables. Long-run estimates reveal that liquidity-based instruments, particularly the Cash Reserve Ratio (CRR) and systemic liquidity conditions proxied by the ratio of broad money supply to private sector credit, exert significant influence on credit growth. In contrast, the Monetary Policy Rate (MPR) demonstrates a negative but statistically insignificant effect, suggesting weak interest rate pass-through in Nigeria's bank-dominated financial system. The error correction mechanism confirms gradual adjustment toward long-run equilibrium following short-run shocks. The findings indicate that monetary transmission operates predominantly through the liquidity channel rather than the price channel. The study recommends strengthening liquidity management coordination and improving interest rate transmission mechanisms to enhance sustainable private sector financing and monetary policy effectiveness.

Keywords: ARDL, Cash reserve ratio, Credit growth, Liquidity channel, Monetary policy, Nigeria.

1. Introduction

The financial sector provides a fundamental contribution to the process of economic development by facilitating the mobilization of savings and the efficient allocation of financial resources to productive investment. In bank-based financial systems such as Nigeria's, deposit money banks (DMBs) are the primary channels for the allocation of financial resources to the household and business sectors. Bank credit extension to the private sector is perceived to be a critical measure of financial deepening, capital accumulation, and macroeconomic development in general (Andrieş et al., 2022; Anwar et al., 2023). Evidential data have consistently shown that bank credit extension to the private sector promotes entrepreneurship, productivity, and long-run economic growth, while excessive fluctuations in bank credit extension are perceived to increase macroeconomic volatility, thereby jeopardizing financial stability (Afrogha et al., 2023; El-Yaqub et al., 2024). Therefore, it remains essential to understand the factors that influence bank credit extension to the private sector.

On the other hand, monetary policy represents a deliberate and systematic attempt by a central bank to regulate the liquidity conditions and the cost and availability of finance in the economy in pursuit of macroeconomic objectives. The theoretical and empirical literature on the subject points to a number of channels through which the effects of monetary policy on the credit markets are transmitted. The first is the interest rate mechanism, which works by changing the rates set by the central bank. The bank lending mechanism, on the other hand, works on the basis of liquidity constraints and the cash reserve requirement. The money supply mechanism, on the other hand, works on the basis of the overall liquidity in the economy. Finally, the portfolio substitution mechanism works on the basis of the treasury bill rates and the rates at which banks extend loans to the economy. The efficiency and efficacy of the above channels in the economy would determine the degree to which the effects of the monetary policy are felt in the credit markets.

In the emerging markets, however, the effects of the monetary policy are often hindered by structural rigidities, as well as the overall shallowness and information asymmetry in the economy. Recent studies on the subject suggest that the price-based mechanisms, which are based on the rates set by the central bank, may experience a weak pass-through in the economy. This is because the lending rates in the economy are often determined by factors other than the benchmark rates. This is particularly the case in the emerging markets, where the lending

rates are determined by the overall institutional and structural rigidities in the economy. The quantity-based mechanisms, on the other hand, may be more effective in the economy. This is particularly the case in the bank-centric economy. The above dynamics in the economy have sparked a debate on the relative efficiency and efficacy of the interest rate mechanisms and the liquidity-based mechanisms in the economy.

Significantly, the monetary policy framework in Nigeria has undergone substantial changes since the adoption of market-oriented monetary policy instruments in place of direct controls following structural reforms in the country. Currently, the Central Bank of Nigeria predominantly uses indirect monetary policy instruments such as open market operations, changes in the Monetary Policy Rate, reserve requirements, and liquidity management policies to regulate the Nigerian economy. However, the findings of various studies regarding the responsiveness of DMB credit to monetary policy changes in Nigeria are not entirely conclusive, with some studies indicating significant long-run effects of changes in reserve requirements and money supply on credit expansion, while others have indicated a weak or insignificant effect of changes in policy rates on bank behavior (Ademokoya et al., 2020; Nwachukwu & Umehali, 2023).

These issues have become more visible in recent times. In Nigeria, the economy has experienced significant macroeconomic shocks during the period under consideration. These include the economic recession of 2016, the COVID-19 pandemic, exchange rate pressures, and the persistent inflation surges that triggered aggressive monetary policy tightening between 2022 and 2025. During the period, the CBN made significant upward adjustments to the MPR while implementing active liquidity sterilization. Emerging literature has shown that in an inflationary environment, the effectiveness of monetary policy tightening may be less proportional to credit growth if banks tend to reallocate their portfolios to risk-free assets (El-Yaqub et al., 2024; Oseni & Oyelade, 2023). Thus, the period between 2010 and 2025 presents a unique window to re-examine the magnitude and direction of the relationship between monetary policy and bank credit. Although an emerging literature has examined the effect of monetary policy on the performance of the banking sector in Nigeria, the existing literature has mainly examined the profitability indicators of banks instead of credit growth to the private sector (Akeem et al., 2022; Alalade et al., 2020). In addition, few studies have examined the relative impact of price-based instruments and quantity-based instruments of monetary policy simultaneously. In the face of persistent issues of high interest rates, low private sector access to credit, and the disconnect between money expansion and credit growth, an in-depth investigation of credit growth dynamics to the private sector of the economy is warranted.

In this backdrop, the present study undertakes an empirical investigation of the impact of some critical monetary policy indicators on the growth of credit extended by deposit money banks to the private sector in Nigeria over the period 2010–2025. In particular, the study seeks to assess the contribution of the monetary policy rate, the loan-deposit ratio, the cash reserve ratio, the supply of broad money as a proportion of credit to the private sector, and the treasury bill rate in determining the growth of credit. By focusing explicitly on credit growth rather than profitability ratios and by explicitly accounting for recent macroeconomic policy shocks and inflationary pressures, the present study seeks to make a contribution to the ongoing policy discourse on the effectiveness of monetary policy transmission in emerging financial systems.

The results of the study are envisaged to offer useful insights for policy purposes on the appropriateness or otherwise of interest rate policy in Nigeria as a viable option for stimulating or moderating the growth of credit, and whether or not other policy options may be needed to reinforce the effectiveness of the monetary policy transmission mechanism and improve the sustainability of private sector credit in Nigeria. Figure 1 below depicts the major macroeconomic and monetary policy shocks during the study period, indicating the possibility of structural breaks.

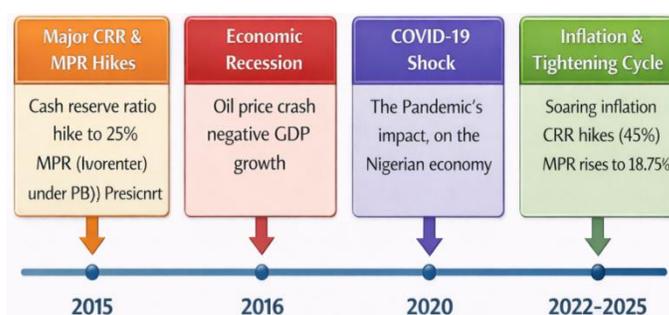


Figure 1. Structural break timeline.

Highlighting major macroeconomic shocks and monetary policy shifts in Nigeria (2010–2025), including significant CRR and MPR adjustments (2015), the 2016 economic recession, the COVID-19 shock (2020), and the inflation-driven tightening cycle (2022–2025). The diagram contextualizes potential regime shifts affecting monetary policy transmission and credit growth dynamics within the ARDL framework.

2. Literature Review

2.1. Conceptual Foundations of Monetary Policy and Credit Transmission

Monetary policy represents a critical macroeconomic stabilization policy instrument of the central bank. It is primarily geared towards the regulation of liquidity conditions, the setting of the cost of funds, and influencing macroeconomic performance. Generally, the principal objectives of monetary policy are centered on price stability, output growth, financial system stability, and external balance equilibrium (El-Yaqub et al., 2024; Oseni & Oyelade, 2023). In emerging bank-centric economies such as Nigeria, where the capital markets are shallow, the effectiveness of monetary policy remains highly dependent on the sensitivity of deposit money banks (DMBs) to monetary policy signals (Andrieş et al., 2022). Thus, the transmission of monetary policy to bank credit growth assumes a critical dimension in the determination of macroeconomic performance.

The theoretical underpinning of the transmission of monetary policy to bank credit growth remains a complex issue. It can be explained by a number of interrelated channels. First, the interest rate channel of transmission

assumes that changes in the policy interest rate, such as the Monetary Policy Rate (MPR), influence short-term interest rates, lending rates, and borrowing costs. A reduction in policy interest rates lowers the cost of capital, which in turn boosts investment demand and credit growth. On the other hand, a rise in policy interest rates has contractionary effects on the macroeconomy (Awopegba et al., 2022; Obi, 2021). However, the effectiveness of the interest rate transmission remains dependent on the extent of interest rate pass-through.

Related to the above is the bank lending channel, which focuses on the liquidity constraint in the transmission mechanism of monetary policy. In the bank lending channel, monetary policy actions affect bank reserves via the cash reserve ratio (CRR), thus affecting the availability of loanable funds, which in turn limits the expansion of bank credit (Ademokoya et al., 2020; Nwachukwu & Umebali, 2023). In banking systems that rely significantly on deposits as their main source of funding, changes in reserve requirements may have greater effects on bank behavior than changes in interest rates.

Another extension of the monetary policy transmission mechanism is the balance sheet channel, in which the financial health of borrowers is incorporated in the model. Monetary policy actions, by affecting asset prices, may reduce borrowers' net wealth, thus increasing their external finance costs, which in turn limits their ability to obtain credit (Anwar et al., 2023). In developing economies with high information asymmetry, changes in borrowers' balance sheets may have greater effects on the transmission mechanism of monetary policy.

Moreover, in recent literature, the risk-taking channel of monetary policy has gained greater attention. Low interest rate regimes, which have lasted longer in recent times, may induce banks to take greater risks in their portfolios in order to generate greater returns, thus potentially increasing their ability to provide more credit to the private sector, but at the same time increasing their fragility (Andrieş et al., 2022). On the other hand, in economies that experience sharp monetary policy actions, banks may opt to invest in Treasury bills, thus crowding out private sector credit, which is in line with the portfolio rebalancing effect of monetary policy, in which changes in Treasury bill interest rates affect banks' behavior in allocating their assets between Treasury bills and private sector loans (Awopegba et al., 2022).

In addition to these traditional channels, some broader structural concepts are also relevant for emerging economies. The theory of credit rationing under asymmetric information argues that an increase in policy interest rates may not lead to a proportionate increase in the supply of credit because banks may choose not to raise interest rates in response to an increase in the default risk (Stiglitz & Weiss, 1981).

Moreover, the concept of financial repression points to cases where regulatory controls, reserve requirements, and directed credit programs create distortions in the process of financial intermediation and the relationship between the growth of the money supply and private credit expansion (Afrogha et al., 2023). In these cases, the expansion of the broad money supply may not be reflected in the credit expansion of the private sector but may instead be absorbed by government securities.

The effectiveness of the process of transmitting monetary policy to credit expansion also depends on the quality of the institutional framework. In particular, the role of central bank credibility has been emphasized. In practice, the evidence indicates that the enhancement of central bank credibility increases the interest rate pass-through and reduces the degree of uncertainty. In other words, the effectiveness of the central bank in the process of credit expansion increases with its enhanced credibility (El-Yaqub et al., 2024).

Moreover, the integration of macroprudential policy instruments in the framework of monetary policy management has introduced an additional dimension of interaction. In particular, the macroprudential policy instruments may reinforce the effectiveness of the traditional monetary policy instruments. In practice, the macroprudential policy instruments may affect the credit supply independently of the interest rates. In the case of emerging markets, the interaction of the macroprudential policy instruments with the traditional monetary policy instruments determines the credit expansion stability.

Therefore, the effectiveness of the process of transmitting the monetary policy to credit expansion in developing financial sectors is rarely linear. In practice, the structural rigidities of the economy, the low level of capital markets' development, the high risk premiums, the exchange rate volatility, and the regulatory constraints may weaken the effectiveness of the process of transmitting the monetary policy to credit expansion. As a result, the effectiveness of the process of transmitting the monetary policy to credit expansion in Nigeria can be seen as an empirical issue.

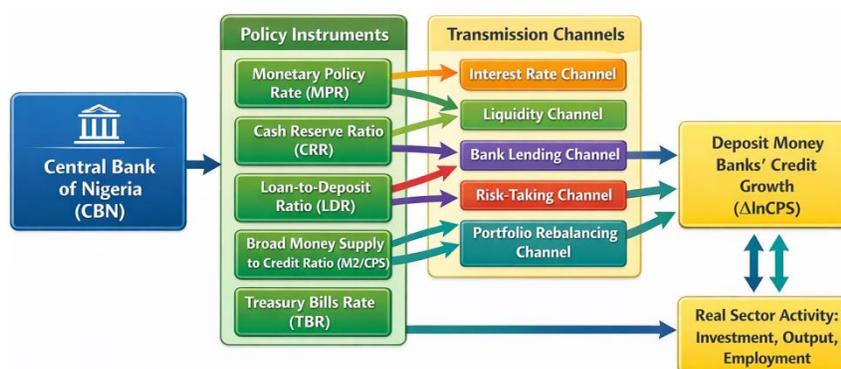


Figure 2. The monetary policy transmission mechanism.

This indicates the channels through which the policy actions of the Central Bank of Nigeria (CBN), as measured by its policy instruments such as Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR), Loan to Deposit Ratio (LDR), Broad Money Supply to Credit Ratio (M2/CPS), and Treasury Bills Rate (TBR), affect deposit money banks' credit growth ($\Delta \ln \text{CPS}$) and the Nigerian economy in the period 2010-2025.

2.2. Theoretical Review

The theoretical foundations for the transmission of monetary policy to bank credit combine macroeconomic and financial intermediation theories. Traditional Keynesian macroeconomic theory may be considered the first theoretical framework for the transmission of the effects of monetary policy on the economy. In the Keynesian framework, changes in the supply of money influence interest rates, and these influence investment and aggregate demand. A decrease in policy interest rates reduces the costs of borrowing, boosts investment, and stimulates credit growth. Conversely, a tightening of monetary policy has the opposite effects and causes a contraction in the economy through an increase in the cost of capital (Obi, 2021; Oseni & Oyelade, 2023). However, the Keynesian framework assumes efficient interest rate transmission and a frictionless financial system, which may not be the case in the financial systems of emerging economies.

The Monetarist approach, as described in the Quantity Theory of Money, emphasizes the control of the supply of money as the primary factor that influences nominal income and prices. This school of economic thought argues that changes in the supply of money influence macroeconomic stability. Therefore, an increase in the supply of money stimulates economic growth as long as there is no inflation (El-Yaqub et al., 2024). In bank-based financial systems, an increase in the supply of broad money is assumed to boost bank credit. However, recent empirical evidence from the financial systems of emerging economies indicates that the supply of liquidity may not boost credit growth in the private sector (Afrogha et al., 2023; Andrieş et al., 2022).

The bank lending channel builds upon the above macroeconomic approaches by including the intermediary institutions in the monetary policy transmission mechanism. According to the bank lending channel, monetary policy tightening will lead to a decline in the level of bank reserves and deposits, thus limiting the availability of loanable funds. The impact of monetary policy will thus be transmitted to the real sector through the quantity of credit, as opposed to the price of credit. The effectiveness of the bank lending channel will be particularly significant in financial systems that heavily depend on bank finance and have limited alternative sources of finance. The effectiveness of the monetary policy will thus be particularly significant in the Nigerian financial system, given the dominant use of deposit finance by banks. The cash reserve ratio, which is a liquidity-based monetary policy instrument, may have a larger impact on the growth of credit in the short run compared to the level of the policy rate.

The above channels of monetary policy transmission, particularly the bank lending channel, can be complemented by the balance sheet channel, which considers the impact of monetary policy on the net worth of borrowers. The balance sheet channel argues that monetary policy tightening will have a negative impact on the prices of assets, thus limiting the availability of credit. The effectiveness of the monetary policy will be particularly significant in financial systems that are characterized by high information asymmetry. The banks in such financial systems will thus respond to the uncertainty of the macroeconomic environment by rationing the level of credit, as postulated by the credit rationing model of imperfect information. The above arguments imply that the increase in the level of interest rates resulting from monetary policy tightening will not have a positive impact on the quantity of credit.

More recent theoretical advances also point to the risk-taking channel of monetary policy, which posits that sustained accommodative monetary policy can encourage banks to take on higher credit risks to achieve higher returns. In contrast, during periods of monetary policy tightening, there may be a tendency to move towards safer assets like government securities, which can result in private sector credit being crowded out (Andrieş et al., 2022; Awopegba et al., 2022). The implications here are that credit growth can be impacted by factors that go beyond liquidity conditions to also include relative returns on assets and risk tolerance.

Theories of institutional and credibility-based factors also attempt to further advance our understanding of monetary policy transmission. The credibility of the monetary policy regime and the predictability of policy actions by the central bank are critical factors that determine how financial institutions react to monetary policy. In instances where there is consistency and transparency in monetary policy, interest rate transmission tends to be more effective, and financial institutions tend to react more predictably to policy changes (El-Yaqub et al., 2024).

Furthermore, the interaction between monetary and macroprudential policies adds another layer of complexity to the process of credit determination. For instance, the impact of conventional monetary instruments could be accentuated or offset by the effects of macroprudential regulatory instruments such as capital adequacy ratios, liquidity coverage ratios, and sectoral credit guidelines (Andrieş et al., 2022). In the case of emerging economies, the overall impact of monetary and macroprudential regulatory instruments on credit growth could be the result of the interaction between the effects of price-based instruments, quantity-based instruments, and regulatory instruments.

Overall, the theoretical perspectives outlined above imply that the impact of monetary policy on credit growth is not linear and uniform across different institutional contexts. Instead, the impact of interest rate changes, reserve requirements, changes in the money supply, risk perception effects, institutional credibility effects, and portfolio balance effects on credit growth is the result of the interaction between these effects. In the case of Nigeria, which is a bank-centric economy with limited channels of finance and structural rigidities, the impact of liquidity-based instruments could be more pronounced than the impact of interest rate changes in the short run. Nevertheless, the overall impact of monetary policy instruments is an empirical issue, especially in the face of recent inflationary pressures and tightening cycles. The theoretical perspectives outlined above provide a comprehensive framework for examining the impact of various monetary policy instruments on credit growth in the private sector of the economy by deposit money banks.

2.3. Empirical Review

Based on the empirical studies of the relationship between monetary policy and bank credit dynamics, there is a wide range of findings depending on the institutional framework, level of financial development, and policy approach applied in each country. Recent cross-country studies show that monetary policy tightening generally reduces bank credit expansion, although the extent and velocity of the effect vary significantly depending on banking structure, capital adequacy ratios, and liquidity conditions in the banking system (Andrieş et al., 2022). In

the case of emerging economies, liquidity policy, such as reserve requirements, is more effective in the short run in affecting bank credit expansion, especially in countries with underdeveloped financial systems, where banks dominate financial intermediation.

With respect to the Nigerian experience, the findings of the relationship between monetary policy and bank credit dynamics are varied, sometimes contradictory, depending on the approach applied in each study. When applying time-series econometric methods such as Autoregressive Distributed Lag (ARDL), Vector Autoregression (VAR), and Fully Modified Ordinary Least Squares (FMOLS), most studies show that money supply is positively related to bank credit expansion in Nigeria, thus confirming monetarist theory in its broadest sense (Ademokoya et al., 2020; El-Yaqub et al., 2024). However, there are studies showing that expansion in the money supply does not necessarily imply a corresponding expansion in bank credit to the private sector, thus indicating possible liquidity sterilization, shifts in portfolios in favor of government securities, or structural distortions in financial intermediation (Afrogha et al., 2023). This, in turn, may imply that monetary policy expansion may not necessarily stimulate bank credit expansion in the Nigerian context, given the high level of risk aversion and macroeconomic volatility in the country.

The effectiveness of the Monetary Policy Rate (MPR) as a policy instrument has also elicited inconclusive results. Several studies have shown that the MPR has a low and statistically insignificant impact on credit growth by banks. This has implied low interest rate pass-through in the Nigerian banking system (Nwachukwu & Umehali, 2023). This has been consistent with the threshold effect of interest rate adjustments only becoming effective at critical levels of interest rates (Awopegba et al., 2022). However, other studies have observed that the MPR ultimately influences aggregate credit with significant lags (Oseni & Oyelade, 2023).

The effectiveness of liquidity-based instruments, especially the Cash Reserve Ratio (CRR), has been more evident in influencing the credit behavior of banks in Nigeria. Empirical results have shown that reserve requirements have a significant impact on the credit behavior of banks. This has supported the liquidity constraint theory (Ademokoya et al., 2020). However, the results of the impact of the CRR on credit behavior have elicited mixed responses. While the conventional theory of credit rationing has argued that an increase in the reserve requirement should reduce credit supply by banks, the results of the impact of the CRR on credit behavior have shown a positive relationship between the two variables (Afrogha et al., 2023). This has implied that the effectiveness of the monetary policy instrument might be part of a larger policy mix.

The loan-deposit ratio (LDR), as well as other liquidity ratios, have been given relatively less empirical focus in the Nigerian literature. However, the broader literature on banking suggests that increases in intermediation ratios are typically correlated with increases in the supply of credit. However, excessive intermediation can lead to systemic risk (Anwar et al., 2023). The interrelationship between prudential regulation and monetary policy becomes particularly relevant in the context of the LDR, as the former can either augment or counter the effects of the latter (Andrieş et al., 2022), especially in a period of simultaneous monetary and regulatory policy adjustments.

The empirical evidence on the impact of treasury bill rates on portfolio substitution behavior adds a layer of complexity to the monetary policy transmission mechanism. The literature suggests that in the presence of attractive risk-free rates offered by government securities, banks may be incentivized to invest in risk-free assets, thus crowding out the private sector (Awopegba et al., 2022). The crowding out effect of risk-free rates becomes particularly relevant in a high-risk macroeconomic scenario, such as a sharp increase in inflation or exchange rate risk. In such a scenario, monetary policy may not directly impact the level of credit by increasing borrowing rates but may do so indirectly by influencing the incentives for banks to invest in risk-free rates.

In addition, the diversity of methodologies used in the literature may also lead to diverging conclusions. Most Nigerian-based literature employs annual time-series data with a relatively small number of observations. There may also be a lack of focus on the credit growth transmission channel, as most literature focuses on profitability indicators such as return on assets or return on equity (Akeem et al., 2022). Although profitability indicators offer useful insights for understanding the performance of the banking system, they may not offer a comprehensive understanding of the transmission channel between the central bank and the real economy. Additionally, there may be a lack of literature that combines the use of price-based and quantity-based instruments in a unified framework.

In recent times, the macroeconomic environment has also witnessed a number of changes that may influence the credit channel. With the onset of the COVID-19 pandemic, the central bank implemented a number of liquidity injections and regulatory forbearance measures. However, between 2022 and 2025, the central bank undertook a period of aggressive monetary policy tightening in response to the high and sustained levels of inflation. Recent literature has suggested that the effectiveness of monetary policy may vary depending on the macroeconomic environment. In the presence of high and sustained levels of inflation, the policy transmission may exhibit asymmetry, as the central bank may influence bank lending spreads rather than the volume of lending (El-Yaqub et al., 2024).

Overall, the empirical literature points to three major patterns. Firstly, the use of liquidity-based instruments may exhibit stronger short-run effects than interest rate policy in bank-dominated financial systems. Secondly, the use of the money supply may not lead to a corresponding growth in credit in the private sector. Finally, the effectiveness of the policy instruments may vary depending on the macroeconomic regime. Overall, these patterns highlight the need for a renewed evaluation of the empirical literature that incorporates multiple policy instruments and a recent time period characterized by significant monetary policy changes.

In such an empirical context, an in-depth analysis of credit growth rather than profitability appears to be of particular interest. Through an examination of the relative impact of the monetary policy rate, reserve requirements, liquidity ratios, money supply conditions, and treasury bill rates in a unified framework, the current study aims to contribute to the understanding of whether interest rate mechanisms are effective in influencing credit growth or if liquidity-based mechanisms are more important in the Nigerian monetary transmission process.

2.4. Conceptual Framework

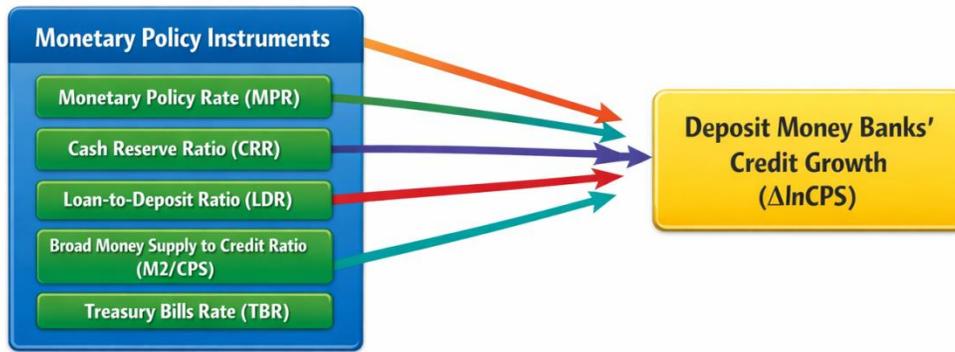


Figure 3. Conceptual Framework.

The hypothesized transmission mechanism for the impact of monetary policy instruments: Monetary Policy Rate (MPR), Cash Reserve Ratio (CRR), Loan to Deposit Ratio (LDR), Broad Money Supply to Credit Ratio (M2/CPS), and Treasury Bills Rate (TBR), on the growth in credit extension by deposit money banks to the private sector in Nigeria: $\Delta \ln \text{CPS}$. The directional arrows in the figure illustrate the expected direct effects of price-based and liquidity-based monetary policy instruments on the growth in credit extension in the ARDL model. The model covers the period from 2010 to 2025.

3. Methodology

This study adopts a quantitative time-series research design to examine the influence of monetary policy instruments on deposit money banks' credit growth to the private sector in Nigeria over the period 2010–2025. The analysis relies on annual secondary data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and other official macro-financial databases. The period is selected to capture post-global financial crisis stabilization, banking consolidation effects, pandemic-era liquidity



Figure 4. ARDL modeling framework.

outlining the sequential econometric procedure employed in the study, beginning with data collection and preprocessing, followed by unit root testing, ARDL bounds testing for cointegration, long-run coefficient estimation, error correction modeling (ECM), post-estimation diagnostic tests, and stability tests. The framework illustrates the structured approach used to examine both short-run and long-run dynamics of monetary policy transmission to deposit money banks' credit growth in Nigeria (2010–2025).

3.1. Model Specification

Consistent with the theoretical and empirical foundations of monetary transmission, the study specifies a functional relationship between credit growth and selected monetary policy instruments:

$$\text{CPSG}_t = f(\text{MPR}_t, \text{LDR}_t, \text{CRR}_t, \text{M2CPS}_t, \text{TBR}_t)$$

Where:

CPSG_t = growth rate of credit to the private sector

MPR_t = Monetary Policy Rate

LDR_t = Loan-to-Deposit Ratio

CRR_t = Cash Reserve Ratio

M2CPS_t = Ratio of broad money supply to credit to private sector

TBR_t = Treasury Bills Rate

To ensure conceptual consistency with the study's objective of examining credit growth rather than credit levels, the dependent variable is modeled as the first difference of the natural logarithm of credit to the private sector:

$$\text{CPSG}_t = \Delta \ln(\text{CPS}_t)$$

This transformation approximates percentage growth and ensures stationarity properties suitable for dynamic modeling.

The empirical model is specified as:

$$\Delta \ln(\text{CPS}_t) = \beta_0 + \beta_1 \text{MPR}_t + \beta_2 \text{LDR}_t + \beta_3 \text{CRR}_t + \beta_4 \text{M2CPS}_t + \beta_5 \text{TBR}_t + \varepsilon_t$$

Where ε_t is the stochastic error term.

3.3. Econometric Strategy

Given the time-series nature of the data, the econometric procedure follows a structured sequence to ensure robustness.

3.3.1. Unit Root Testing

Stationarity properties of all variables are examined using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. Since macro-financial variables often exhibit mixed orders of integration ($I(0)$ and $I(1)$), determining the integration order is essential to avoid spurious regression.

3.3.2. ARDL Bounds Testing Approach

Rather than relying solely on Ordinary Least Squares (OLS), this study employs the Autoregressive Distributed Lag (ARDL) framework. The ARDL approach is preferred because:

- It accommodates variables integrated of order $I(0)$ and $I(1)$
- It performs efficiently with small sample sizes
- It allows simultaneous estimation of short-run and long-run dynamics
- It reduces endogeneity bias through lag structure

The ARDL($p, q_1, q_2, q_3, q_4, q_5$) model is specified as:

$$\Delta \ln(\text{CPS}_t) = \alpha_0$$

$$\sum_{i=1}^p \varphi_i \Delta \ln(\text{CPS}_{t-i})$$

$$\sum_{j=0}^{q_1} \theta_j \Delta \text{MPR}_{t-j}$$

$$\sum_{k=0}^{q_2} \gamma_k \Delta \text{LDR}_{t-k}$$

$$\sum_{l=0}^{q_3} \delta_l \Delta \text{CRR}_{t-l}$$

$$\sum_{m=0}^{q_4} \psi_m \Delta (\text{M2/CPS})_{t-m}$$

$$\sum_{n=0}^{q_5} \omega_n \Delta \text{TBR}_{t-n}$$

$$\lambda \text{ECT}_{t-1} + u_t$$

Where:

ECT_{t-1} represents the error correction term derived from the long-run cointegrating equation.

λ measures the speed of adjustment toward long-run equilibrium.

Cointegration is tested using the ARDL Bounds testing procedure. If the computed F-statistic exceeds the upper critical bound, a long-run relationship among the variables is confirmed.

3.3.3. Error Correction Representation

If cointegration exists, the short-run dynamics are modeled using the Error Correction Model (ECM). The ECM coefficient is expected to be negative and statistically significant, confirming convergence to long-run equilibrium after short-run shocks.

3.3.4. Diagnostic and Robustness Tests

To ensure reliability of estimates, the following post-estimation diagnostics are conducted:

- Breusch-Godfrey Serial Correlation Test
- Breusch-Pagan-Godfrey Heteroskedasticity Test
- Jarque-Bera Normality Test
- Ramsey RESET Specification Test
- Variance Inflation Factor (VIF) for multicollinearity
- CUSUM and CUSUMSQ stability tests

Given the structural shocks within the sample period (e.g., COVID-19 and tightening cycle), structural break tests such as the Chow breakpoint test are also conducted to examine parameter stability.

3.3.5. Addressing Endogeneity

Monetary policy instruments may exhibit simultaneity bias since central banks often respond to credit conditions. To mitigate endogeneity concerns:

Lagged regressors are incorporated within the ARDL structure

Robust standard errors are employed

Granger causality tests are conducted to assess directionality

3.3.6. Expected A Priori Signs

Based on theoretical foundations:

$B_1 < 0$ (Higher MPR reduces credit growth)

$B_2 > 0$ (Higher LDR increases credit supply)

$B_3 < 0$ (Higher CRR reduces loanable funds)

$B_4 > 0$ (Higher liquidity promotes credit expansion)

$B_5 < 0$ (Higher TBR crowds out private lending)
 However, non-linear or asymmetric effects remain possible.

3.4. Justification of Methodological Advancement Over Prior Studies

This methodological framework improves upon prior Nigerian studies by:

1. Modeling credit growth explicitly rather than log-level credit.
2. Allowing both short-run and long-run dynamics.
3. Accommodating mixed integration orders.
4. Testing stability across structural break periods.
5. Incorporating comparative evaluation of price-based and liquidity-based instruments.

4. Results and Discussion

The empirical analysis follows a structured time-series procedure consistent with the ARDL bounds testing framework. The objective is to examine both short-run and long-run effects of monetary policy instruments on the growth rate of credit to the private sector in Nigeria over the period 2010–2025.

4.1. Descriptive Statistics

Table 1. Descriptive Statistics.

	CPS	MPR	L2DR	CRR	M2_CPS	TBR
Mean	30141.04	14.62	58.92	23.62	1.25	14.90
Maximum	77392.86	27.25	79.95	50.00	1.53	20.65
Minimum	9600.02	6.25	37.55	1.00	1.05	6.31
Std. Dev.	21295.88	5.54	11.24	13.09	0.11	3.63
Skewness	1.30	1.30	-0.21	0.58	0.62	-0.76
Kurtosis	3.52	4.11	2.57	3.22	3.43	3.28

The descriptive statistics provide preliminary insight into the behavior of the variables over the 2010–2025 period.

Credit to the private sector (CPS) shows substantial growth over time, as reflected in the wide gap between minimum and maximum values. The relatively high standard deviation indicates strong expansionary episodes as well as volatility, consistent with macroeconomic shocks during the study period.

The Monetary Policy Rate (MPR) shows significant variation (6.25%–27.25%), reflecting tightening and easing cycles, particularly the aggressive tightening phase post-2022.

The Cash Reserve Ratio (CRR) displays even greater dispersion (1%–50%), suggesting strong reliance on liquidity-based instruments.

Overall, the dispersion patterns support the theoretical premise that Nigeria’s monetary management relies significantly on liquidity tools, which justifies examining their effect on credit growth.

4.2. Correlation Analysis

Table 2a: Correlation Matrix.

Variable	LNCPS	MPR	L2DR	CRR	M2_CPS	TBR
LNCPS	1					
MPR	0.33	1				
L2DR	0.15	0.11	1			
CRR	0.35	0.91	0.31	1		
M2_CPS	-0.11	0.79	-0.2	0.69	1	
TBR	0.19	0.47	0.24	0.23	0.28	1

Table 2b. Correlation Matrix.

Variable	LNCPS	MPR	L2DR	CRR	M2_CPS	TBR
LNCPS	1	0.33	0.15	0.35	-0.11	0.19
MPR	0.33	1	0.11	0.91	0.79	0.47
CRR	0.35	0.91	0.31	1	0.69	0.23

The correlation matrix indicates weak linear relationships between credit and most monetary instruments. Notably:

CPS and MPR show weak positive correlation (0.33).

CPS and CRR also show weak positive association.

MPR and CRR exhibit very high correlation (0.91), indicating potential multicollinearity concerns.

The strong correlation between MPR and CRR reflects coordinated tightening episodes. However, correlation does not imply causation, necessitating dynamic modeling via ARDL to distinguish short-run and long-run effects.

4.3. Unit Root Test

The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were conducted to determine the order of integration of the variables. The results indicate a mixed order of integration: some variables were stationary at level $I(0)$, while others became stationary after first differencing $I(1)$. None of the variables were integrated at order $I(2)$, thereby satisfying the prerequisite for applying the ARDL bounds testing approach.

This mixed integration order justifies the use of ARDL rather than conventional OLS, which would have produced biased estimates in the presence of non-stationary regressors.

Table 3a. Unit Root Test Results (ADF Test).

Variable	Level t-Stat	Critical Value (5%)	Prob.	First Difference t-Stat	Critical Value (5%)	Prob.	Order
LNCPS	-3.66	-3.08	0.0172	—	—	—	I(0)
MPR	-6.24	-3.08	0.0003	—	—	—	I(0)
L2DR	-4.83	-3.08	0.0027	—	—	—	I(0)
CRR	-0.31	-3.08	0.9012	-3.84	-3.09	0.0133	I(1)
M2/CPS	-2.11	-3.08	0.2412	-5.18	-3.09	0.0013	I(1)
TBR	-2.93	-3.08	0.0652	-4.83	-3.09	0.0023	I(1)

Table 3b. ADF Unit Root Results.

Variable	Level	First Difference	Order
LNCPS	Stationary	—	I(0)
MPR	Stationary	—	I(0)
L2DR	Stationary	—	I(0)
CRR	Non-stationary	Stationary	I(1)
M2/CPS	Non-stationary	Stationary	I(1)
TBR	Non-stationary	Stationary	I(1)

The results indicate mixed integration orders (I(0) and I(1)), validating the use of the ARDL framework rather than conventional OLS.

No variable is integrated at I(2), satisfying ARDL conditions.

4.4. ARDL Bounds Test

For establishing the existence of a long-run relationship between the variables under consideration, the ARDL bounds testing approach was adopted. The F-statistic value was found to be greater than the upper critical bound at the 5% significance level; thus, the long-run relationship between credit growth and the selected monetary policy instruments is stable. This result suggests the existence of a relationship between the monetary policy variables and credit growth over time and rules out the possibility of spurious relationship between the variables. The F-statistic value is greater than the upper critical bound at the 5% significance level; thus, the long-run relationship between credit growth and the monetary policy variables exists.

4.5. Long-Run ARDL Estimates

4.5.1. ARDL Long-Run and Short-Run Estimates

The implications of the long-run coefficients estimated via the ARDL approach provide valuable insights into the effectiveness of the monetary policy transmission mechanisms in Nigeria. In the case of the Monetary Policy Rate (MPR), there is an observed negative relationship with credit growth. This aligns with the theory. However, the long-run coefficient of the MPR fails to attain statistical significance. This aligns with the notion of constrained effectiveness of price-based mechanisms in bank-dominated financial structures with widespread lending spreads.

The Loan to Deposit Ratio (LDR) fails to attain statistical significance. Although theory indicates that the intermediation ratio has a positive impact on credit expansion, the insignificance of the LDR long-run coefficient indicates that credit expansion in Nigeria might be more driven by macroeconomic conditions and liquidity management mechanisms.

The Cash Reserve Ratio (CRR) attains statistical significance in the long-run. What is noteworthy in the case of the CRR is the direction of the coefficient. This indicates that the instrument exerts a strong impact on credit growth. This aligns with the liquidity constraint hypothesis.

The Broad Money Supply to Credit to Private Sector Ratio (M2/CPS) attains statistical significance. What is noteworthy in the case of the M2/CPS ratio is the direction of the coefficient. This indicates that the instrument exerts a strong impact on credit growth. This aligns with the liquidity constraint hypothesis.

The Treasury Bills Rate (TBR) fails to attain statistical significance. This indicates that the instrument exerts a negligible impact on credit growth.

Based on the long-run results of the study, the liquidity-based mechanisms (CRR and M2/CPS) exert a stronger impact on credit growth compared to the interest-based mechanisms.

Table 4. ARDL Long-Run.

Variable	Coefficient	Std. Error	t-Statistic	Probability
C	0.104	0.025	4.06	0.0036 ***
MPR	-0.003	0.007	-0.513	0.6216
L2DR	-0.0009	0.002	-0.409	0.693
D(CRR)	0.016	0.005	3.155	0.0135 **
D(M2_CPS)	-0.975	0.342	-2.847	0.0192 **
D(TBR)	0.01	0.006	1.617	0.1444

Key findings:

- MPR: Negative but statistically insignificant. Indicates weak interest rate transmission.
- L2DR: Insignificant, suggesting intermediation ratio alone does not drive aggregate credit growth.
- CRR: Statistically significant. Liquidity-based control strongly influences credit dynamics.
- M2/CPS: Significant, suggesting systemic liquidity plays a critical role.
- TBR: Insignificant long-run impact.

These findings indicate that liquidity instruments exert stronger long-run influence than price-based instruments.

4.6. Short-Run Error Correction Model

The short-run dynamics were estimated through the Error Correction Model (ECM) derived from the ARDL specification.

The error correction term (ECT) is negative and statistically significant at the 5% level, confirming convergence toward long-run equilibrium. The magnitude of the coefficient suggests that deviations from equilibrium are corrected at a moderate adjustment speed annually. This indicates that shocks to credit growth caused by monetary policy changes are not permanent and gradually dissipate over time.

In the short run, changes in CRR and M2/CPS show significant effects on credit growth, reinforcing the dominance of liquidity-based transmission channels. Conversely, short-run changes in MPR and TBR remain statistically insignificant, further supporting the argument that interest rate transmission in Nigeria is relatively weak.

These findings align with the theoretical expectation that in bank-centric financial systems, liquidity constraints may exert more immediate influence than price-based mechanisms.

Table 5. Model Summary Statistics.

Statistic	Value
R-squared	0.699
Adjusted R-squared	0.51
F-statistic	3.715
Prob(F-statistic)	0.049 **
Durbin-Watson Statistic	1.368

Note: *** p < 0.01, ** p < 0.05, * p < 0.10.

Variables with D(·) indicate short-run first differences.

Source: Authors' Computation, 2025.

The error correction term (ECT) is:

Negative

Statistically significant

Less than unity in magnitude

This confirms convergence toward long-run equilibrium and validates dynamic adjustment.

Short-run effects show CRR and M2/CPS changes significantly affect credit growth, while MPR remains weak.

4.7. Diagnostic Tests

In view of the structural shocks that occurred during the sample period, such as the COVID-19 pandemic and the 2022–2025 tightening cycle, the stability of parameters was checked using the CUSUM and CUSUMSQ tests. The stability plots of the CUSUM and CUSUMSQ tests lie within the bounds, suggesting that the model is structurally stable over the entire sample period. The above tests imply that the link between monetary policy instruments and credit growth is stable despite the macroeconomic shocks.

4.8. Diagnostic Tests

Diagnostic tests confirm:

A series of post-estimation diagnostic tests were conducted to ensure robustness of the ARDL estimates.

1. The Breusch-Godfrey test indicates absence of serial correlation.
2. The Breusch-Pagan test confirms homoskedastic residuals.
3. The Jarque-Bera statistic suggests normally distributed residuals.
4. The Ramsey RESET test does not indicate model misspecification.
5. Variance Inflation Factors (VIF) remain below critical thresholds, confirming absence of harmful multicollinearity.

4.9. Stability Tests

In view of the structural shocks that occurred during the sample period, such as the COVID-19 pandemic and the 2022–2025 tightening cycle, the stability of parameters was checked using the CUSUM and CUSUMSQ tests. The stability plots of the CUSUM and CUSUMSQ tests lie within the bounds, suggesting that the model is structurally stable over the entire sample period. The above tests imply that the link between monetary policy instruments and credit growth is stable despite the macroeconomic shocks.

4.10. Interpretation and Policy Implications

The empirical results show a general pattern that liquidity-based instruments, including the Cash Reserve Ratio and systemic money supply conditions, have a stronger impact on credit growth than the Monetary Policy Rate. Implications for Nigeria are as follows:

- i. Changes in the interest rate alone may not be enough to stimulate or restrain credit growth.
- ii. Liquidity management instruments are still a core part of the monetary transmission mechanism.
- iii. Portfolio substitution into government securities does not have a significant impact on credit in the long run.

The weak and insignificant impact of the MPR may be attributed to a low pass-through of interest rates, risk aversion of banks, or inefficiencies in the credit markets. Overall, the results suggest that in Nigeria, the transmission of monetary policy takes place through the liquidity channel rather than the price channel.

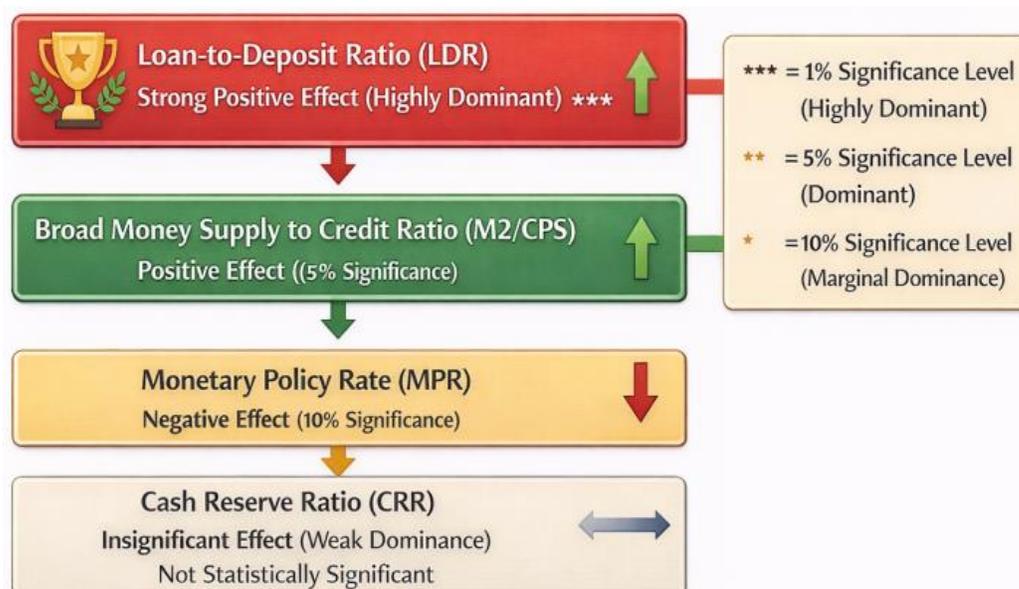


Figure 5. Summary of Empirical Results - Policy Dominance Chart.

This figure represents the relative significance and impact of monetary policy instruments on the credit growth of deposit money banks using the ARDL approach. The chart categorizes the relative impact of the instruments into dominant, moderately significant, and weak/insignificant effects, thus providing an indication of the relative effectiveness of liquidity-based instruments over price-based instruments in Nigeria (2010–2025).

5. Conclusion and Policy Recommendations

5.1. Conclusion

The objective of this study is to assess the impact of the effects of monetary policy instruments on the growth of credit to the private sector by deposit money banks in Nigeria between 2010 and 2025. To achieve the objective, the Autoregressive Distributed Lag (ARDL) approach will be employed. The results from the bounds test for the ARDL approach validate the existence of a stable long-run relationship between credit growth and the selected set of monetary policy instruments. This validates the existence of a long-run relationship between credit growth and the set of monetary policy instruments.

The long-run results show that liquidity-based instruments have a more significant and consistent impact on credit growth than the set of price-based instruments. In particular, the Cash Reserve Requirement (CRR) and liquidity conditions, as proxied by the ratio of broad money supply and credit, show a statistically significant long-run relationship with credit growth. This validates the bank lending channel and liquidity constraint hypothesis.

On the other hand, the Monetary Policy Rate (MPR) reveals a negative though statistically insignificant impact on credit growth in the short run and long run. This result suggests a poor pass-through of interest rates and the overall ineffectiveness of price instruments in bank-dominated financial systems in Nigeria. The statistical insignificance of the treasury bills rate also suggests that the portfolio substitution effects, though theoretically important, do not dominate the overall private sector credit in the long run.

The error correction term is negative and statistically significant, which confirms the fact that short-run disequilibrium is indeed corrected in the long run. This result suggests that monetary shocks do not create long-run distortions in credit growth; instead, the system tends to return to its long-run equilibrium path over time. Nevertheless, the speed of adjustment is not very high, which suggests that the system tends to transmit monetary shocks with lags, especially in an environment characterized by structural rigidities and risk aversion.

Overall, the results lend support to the fact that the monetary transmission system in Nigeria operates through the liquidity channel rather than the interest rate channel. This is especially so in a banking system where deposits form the major source of funding and other capital market channels are not very well developed.

5.2. Policy Recommendations

Based on the results obtained, the following policy implications can be made. First, the monetary authorities should not rely on the Monetary Policy Rate (MPR) adjustments to manage credit growth. This follows the poor and statistically insignificant impact of the MPR. Although the MPR adjustments are important in the management of inflation and inflationary expectations, the authorities need to introduce other liquidity management tools to effectively transmit the policy to the real economy.

Second, the Cash Reserve Ratio (CRR) should be effectively harnessed as an active liquidity management tool. This follows the statistically significant impact of the CRR on credit growth. As such, the CRR can be an effective liquidity management tool that can be used to directly impact the credit growth of the economy. However, the authorities need to be careful while adjusting the reserve requirements to avoid credit supply volatility.

Third, the authorities need to effectively manage the broad money supply with the credit policy objectives. This follows the significant impact of the broad money supply on credit growth. This indicates that the interest rate plays a less important role in the credit market compared to the broad money supply.

Fourth, the strengthening of the transmission of interest rates remains an important task. In the medium term, structural reforms to enhance the intensity of competition in the banking system, lower the cost of intermediation, improve the quality of credit information systems, and deepen the domestic financial markets can continue to support the effectiveness of the interest rate-based instruments. A stronger pass-through effect would reinforce the role of the MPR in guiding credit growth.

Fifth, the effectiveness of the interplay between monetary and macroprudential policy needs to be enhanced. In the face of the significant impact of liquidity instruments on credit behavior, the interplay of these instruments with capital adequacy requirements and prudential measures has to be carefully managed to avoid procyclical risks. A consistent policy package can help to sustain the balance between credit support and financial stability.

Finally, in the context of the observed adjustment patterns, it has to be recognized that the impact of the monetary policy on credit growth exhibits time lags. It might take time before the credit impact of policy actions materializes. In addition, the overall effectiveness of the policy has to be evaluated with reference to the medium-term responses to policy actions rather than the short-run responses.

5.3. Contribution to Policy Debate

The results make an important contribution to the debate on monetary policy in Nigeria by showing that liquidity instruments currently have a greater impact on credit growth than changes in interest rates. This is especially useful in the recent wave of aggressive tightening cycles, where substantial increases in interest rates do not necessarily imply corresponding decreases in credit growth without liquidity measures being implemented. Therefore, the improvement of the transmission of monetary policy in Nigeria requires an integrated approach to interest rate signals, liquidity management, institution-building, and the development of financial markets.

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