



**Doi: 10.53790/ajmss.v6i1.111**

**ISSN: 2811-1613**

Submitted: August 2024; Revised: November, 2024; Accepted: January 2025

ARTICLE

## **Assessing the Short- and Long-Term Impact of Inflation Targeting Framework in Nigeria**

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### **Abstract**

This study evaluates the short- and long-term impact of inflation targeting on inflation control in Nigeria, considering the country's unique structural challenges. Using annual time series data from 1981 to 2023, the study employs the Autoregressive Distributed Lag (ARDL) model to assess the relationship between key macroeconomic variables such as inflation, monetary policy rate, central bank communication and transparency, money supply, real GDP, insecurity, and central bank independence. The findings reveal that while the monetary policy rate and central bank communication and transparency significantly reduces inflation, factors such as insecurity and money supply contribute to inflationary pressures. The results emphasize the importance of central bank independence and effective communication for successful implementation of inflation targeting framework. Additionally, the study highlights the limitations of inflation targeting in addressing structural challenges, such as supply-side constraints and insecurity. In conclusion, the study provides critical insights into the feasibility of adopting an inflation-targeting framework in Nigeria and suggests policy improvements for better inflation management.

**Keywords:** Inflation, inflation targeting, monetary policy, Nigeria

**Cite as:** Joseph, T. E., Obikaonu, P., Alase, G. A., Lamidi, S. O, Ridwan, D. (2025). Assessing the short- and long-term impact of inflation targeting framework in Nigeria. *Applied Journal of Economics, Management, and Social Sciences*, 6(1), 11-23

### **1. Introduction**

In recent years, the debate around adopting an inflation-targeting framework has gained prominence in Nigeria's monetary policy discussions. Inflation targeting, which involves the public announcement of an inflation goal and the use of policy tools to achieve this goal, is seen as a credible approach to achieving long-term price stability.

While several advanced and emerging economies have successfully adopted inflation targeting as their primary monetary framework, Nigeria's unique economic environment, characterized by structural and supply-side inflation, makes the adoption of this framework more complex (Bianchi et al., 2021; Peters et al., 2020).

Inflation in Nigeria has been driven not only by demand-side factors but also by persistent supply-side constraints such as high import dependence, insecurity, poor infrastructure – technology shock, and currency volatility, which complicate the inflation control efforts of the Central Bank of Nigeria (CBN) (Ahmed et al., 2021; Joseph et al., 2021).

Nigeria's central bank has made significant strides toward implementing some inflation-targeting practices. These include the clear communication of policy decisions following the Monetary Policy Committee (MPC) meetings, which are held bi-monthly, and efforts to align monetary policy with inflation outcomes (Olowofeso et al., 2021). However, the CBN is yet to formally adopt a full-fledged inflation-targeting regime, as its policies remain influenced by a variety of non-monetary factors that affect inflation. Key among these factors are structural challenges, including insecurity in agricultural regions that disrupt food supply, the foreign exchange crisis that increases import costs, and the high levels of informality in the economy, where a large portion of economic activities remain outside the purview of official monetary control (Bala-Keffi et al., 2020; Joseph et al., 2024).

The consideration of inflation targeting in Nigeria also raises critical questions about the readiness of the economy to operate under such a regime. In developed and many emerging economies, inflation targeting has been successful due to robust financial systems, stable political environments, and the independence of central banks (Fratzscher et al., 2020; Hoffmann et al., 2022). In contrast, Nigeria faces challenges such as fiscal dominance, where government borrowing from the CBN raises inflationary pressures (Budianto et al., 2023). Additionally, the strong presence of middlemen in key sectors, particularly in agriculture, further distorts price levels, making inflation targeting difficult to execute effectively. CBN's monetary policies, while designed to curb inflation, often have limited impact on these entrenched structural issues, which are not as responsive to interest rate adjustments or liquidity management (Budianto et al., 2023).

A key consideration for Nigeria is whether inflation targeting can effectively address the country's unique inflationary dynamics. Much of the inflation in Nigeria is structural, driven by factors such as insecurity in the northern regions, which has severely impacted agricultural production, leading to persistent food inflation (Pham et al., 2023). Additionally, the country's exchange rate volatility, fueled by dependency on oil exports and fluctuations in global oil prices, has created currency

devaluation risks that further drive imported inflation (Adler et al., 2021). The CBN's ongoing battle with stabilizing the naira exchange rate and managing inflation, despite various interventions in the foreign exchange market, highlights the limitations of conventional monetary policy tools in the face of such structural challenges (Meilianna, 2020).

For inflation targeting to be effective in Nigeria, certain preconditions must be met. These include greater central bank autonomy, a more stable fiscal environment, and the reduction of fiscal dominance where the government borrows heavily from the central bank to finance deficits (Junankar & Wong, 2020). Moreover, a more developed financial market, which allows for better transmission of monetary policy decisions, would be essential. Nigeria's financial sector, though growing, still faces liquidity and depth challenges that could hinder the implementation of an inflation-targeting framework (Dua, 2023). Furthermore, enhanced coordination between monetary and fiscal policy is crucial, as unchecked fiscal imbalances can undermine any inflation-targeting efforts. The interplay between the CBN's objectives and government policy remains a significant factor in determining the success of any shift toward a formal inflation-targeting regime (Coibion et al., 2020).

Given these complexities, this study aims to evaluate the feasibility and potential impact of inflation targeting on inflation control in Nigeria. Specifically, the study will investigate the short- and long-term effects of inflation-targeting practices on inflation trends, considering the structural factors that complicate monetary policy effectiveness. By doing so, the research will provide critical insights into whether inflation targeting is a suitable monetary policy framework for Nigeria, considering its current economic realities. Moreover, the study will explore policy options available to CBN in navigating these challenges and propose a strategic roadmap for potentially adopting a full-fledged inflation-targeting framework.

## 2. Literature Review

### 2.1 Theoretical Framework

A dominant theoretical framework employed in examining inflation targeting and monetary policy framework in literature is the Taylor Rule. The Taylor Rule, introduced by economist John Taylor (1993), provides a systematic way for central banks to adjust nominal interest rates in response to deviations of inflation from the target rate and

deviations of real economic output from its potential level. The rule can be expressed in its basic form as:

$$i_t = r^* + \pi_t + \alpha(\pi_t - \pi^*) + \beta(y_t - y^*) \quad (1)$$

Where;  $i_t$  is the central bank's nominal interest rate,  $r^*$  is the natural rate of interest (the rate that neither stimulates nor slows the economy),  $\pi_t$  is the actual inflation rate,  $\pi^*$  is the target inflation rate,  $y_t - y^*$  is the output gap, or the deviation of actual output from potential output,  $\alpha$  &  $\beta$  are the coefficients that represent the central bank's responsiveness to inflation deviations and output gaps.

In the context of inflation targeting, the Taylor Rule provides a policy framework where central banks adjust interest rates to keep inflation close to its target while also stabilizing the economy. The rule allows policymakers to respond systematically to changes in economic conditions, increasing interest rates when inflation exceeds the target and reducing them when inflation falls below the target. This systematic response creates predictability and helps anchor inflation expectations, which is crucial for the success of inflation-targeting regimes (Taylor, 1999). For Nigeria, adopting inflation targeting through the Taylor Rule would require the Central Bank of Nigeria (CBN) to prioritize inflation control, adjusting interest rates based on deviations of actual inflation from its target level. However, Nigeria's inflation is often driven by structural factors—such as insecurity, agricultural supply shocks, and exchange rate volatility—that may not be directly responsive to traditional monetary tools like interest rates. In this sense, applying the Taylor Rule in Nigeria would likely require adjustments to the coefficients ( $\alpha$  &  $\beta$ ) to account for the economy's sensitivity to inflation and output deviations. As [Fratzcher et al. \(2020\)](#) suggest, successful inflation targeting depends not just on adherence to the Taylor Rule but also on the central bank's credibility and ability to manage inflation expectations.

The Taylor Rule's strength in inflation-targeting regimes lies in its ability to stabilize both inflation and output by guiding interest rate decisions in a predictable manner. By systematically responding to inflationary pressures, the Taylor Rule helps central banks avoid the pitfalls of discretionary policy, which can lead to time inconsistency problems. [Rogoff's \(1985\)](#) conservative central banker model aligns with this, positing that monetary policy should focus on long-term price stability, independent of political pressures. For Nigeria, this would mean empowering the CBN to focus on inflation control through interest rate adjustments without undue influence from fiscal authorities. The degree of central bank

independence is crucial here, as fiscal dominance can undermine the Taylor Rule's effectiveness by forcing the central bank to prioritize short-term fiscal needs over long-term price stability ([Ahmed et al., 2021](#)). However, the successful application of the Taylor Rule in Nigeria depends on the accuracy of real-time data on inflation, output gaps, and the natural rate of interest. In emerging markets like Nigeria, data challenges and the lagged effects of monetary policy actions can complicate the rule's implementation. Additionally, structural factors such as weak financial markets and high informality can limit the transmission of interest rate changes to the broader economy.

### Exchange Rate Pass-Through and Inflation Targeting

A key consideration for inflation targeting in Nigeria, particularly under the Taylor Rule, is the role of exchange rate pass-through (ERPT) to domestic inflation. The ERPT effect refers to the extent to which changes in the exchange rate affect domestic prices, particularly through the cost of imported goods and services. In an open economy like Nigeria's, where a significant portion of goods are imported, exchange rate fluctuations—especially depreciation of the naira—can have significant impact on inflation. This phenomenon is particularly relevant in inflation-targeting regimes, where stabilizing inflation may require addressing external shocks through exchange rate management ([Taylor, 2000](#)).

[Pham et al. \(2023\)](#) show that countries with inflation-targeting regimes tend to have lower ERPT, as the central bank's commitment to maintaining price stability helps anchor inflation expectations, reducing the inflationary impact of exchange rate changes. However, in a country like Nigeria, where exchange rate volatility is often driven by external shocks (e.g., fluctuating oil prices) and speculative capital flows, managing the ERPT becomes a challenge. CBN has historically intervened in the foreign exchange market to stabilize the naira, but in an inflation-targeting framework, excessive intervention may conflict with the goal of price stability by creating excess liquidity in the system ([Adler et al., 2021](#)). ERPT becomes even worse if the fiscal authority favours fiscal revenue through high import duties over minimizing the ERPT through high cost of imported goods.

### 2.2 Empirical Literature

Several empirical studies have examined the challenges and potential of inflation targeting in managing inflation in both developed and developing countries. Majority of these studies have argued that while inflation targeting

can stabilize inflation and enhance monetary policy credibility, its success in developing countries such as Nigeria is likely to depend on several preconditions, including central bank independence, fiscal discipline, and improved communication of policy objectives, and structural righties (Coibion et al., 2020; Junankar & Wong, 2020; Ahmed et al., 2021; Dua, 2023; Pham et al., 2023). The structural challenges most developing countries in Africa faces—such as supply-side inflation, exchange rate volatility, and fiscal dominance—pose significant hurdles to the effective implementation of inflation targeting.

Specifically, Coibion et al. (2020) provide critical insights into the use of inflation expectations as a policy tool in inflation-targeting regimes. Their study highlights how central banks can anchor inflation expectations through clear communication and policy transparency, which in turn, enhances the effectiveness of inflation targeting. They find that managing inflation expectations can significantly reduce the volatility of inflation, especially in emerging markets. In the Nigerian context, where inflation is often driven by structural and supply-side factors, managing expectations through effective communication could mitigate some inflationary pressures. However, the authors also emphasize that achieving this requires credible and independent central banking institutions, a feature that Nigeria struggles with due to fiscal dominance and political interference.

Fratzscher et al. (2020) examine how inflation targeting can act as a shock absorber in the face of economic volatility. Their study finds that countries with inflation-targeting regimes tend to fare better during periods of external economic shocks, particularly through more stabilized inflation and output levels. The authors argue that the credibility of a central bank's commitment to an inflation target is critical in achieving these outcomes. For Nigeria, which faces external shocks such as oil price fluctuations and exchange rate volatility, adopting a full-fledged inflation-targeting regime could potentially help stabilize inflation. However, the structural nature of Nigeria's inflation—rooted in supply constraints and security challenges—may limit the efficacy of inflation targeting alone, suggesting that complementary policies are needed.

Ahmed et al. (2021) investigates the challenges posed by fiscal dominance in inflation and exchange rate targeting. Their research shows that fiscal imbalances can undermine the effectiveness of monetary policy, particularly in developing economies with weak institutional frameworks. Fiscal dominance occurs when governments rely heavily on central bank financing to

cover deficits, which can fuel inflationary pressures. In the Nigerian case, where the government has historically resorted to "ways and means" financing from the CBN, this dynamic poses a significant challenge to adopting inflation targeting. The authors conclude that for inflation targeting to succeed in such contexts, strong fiscal discipline is required to prevent undermining the central bank's inflation control objectives.

Junankar and Wong (2020) provide a robust empirical analysis of the relationship between inflation targeting and economic growth. Their findings suggest that while inflation targeting helps stabilize prices, it can sometimes come at the cost of reduced economic growth, especially in economies that are not structurally prepared for such a regime. This trade-off is more pronounced in developing economies with high levels of informality and structural inefficiencies, which often require accommodative policies to foster growth. For Nigeria, adopting inflation targeting could stabilize inflation but may constrain growth unless structural reforms are simultaneously implemented to address supply-side constraints, improve infrastructure, and enhance the functioning of financial markets.

Budianto et al. (2023) explore the challenges posed by the interest rate lower bound in an inflation-targeting regime. They find that in periods of economic downturns, where the nominal interest rate approaches zero, inflation targeting becomes less effective as the central bank loses its ability to stimulate the economy through traditional monetary policy tools. This issue is particularly relevant for Nigeria, where interest rates have fluctuated but may face downward pressure in response to persistent economic stagnation. In such a scenario, inflation targeting alone may not suffice, and unconventional monetary policy tools may be required to complement the framework. Hoffmann et al. (2022) contribute an important dimension to the debate on inflation targeting by assessing how well households understand inflation-targeting policies. Their study finds that the general public often struggles to grasp the technicalities of inflation targeting, which can limit the policy's effectiveness, as household expectations may not adjust accordingly. This has important implications for Nigeria, where low financial literacy and limited access to information could hinder the effectiveness of an inflation-targeting regime. For inflation targeting to work effectively, the CBN would need to invest significantly in public communication and financial education efforts to ensure that both businesses and households understand and align their expectations with policy goals.

**Pham et al. (2023)** compare the exchange rate passthrough in inflation-targeting and non-targeting countries within the ASEAN-5. They find that countries with inflation-targeting regimes tend to experience lower exchange rate pass-through to inflation, as their central banks are more focused on stabilizing prices. In contrast, non-targeting countries exhibit higher pass-through, leading to greater inflation volatility in response to exchange rate fluctuations. Nigeria, which faces frequent exchange rate crises due to its dependence on oil exports and capital inflows, could benefit from reduced pass-through under an inflation-targeting regime. However, the success of this would depend on how well CBN manages the currency market and controls speculative pressures on the naira. **Bambe (2022)** explores the relationship between targeting inflation and private domestic investment in developing countries. His study finds that inflation-targeting regimes can enhance investor confidence by providing a predictable macroeconomic environment. However, the effect is contingent on the strength of institutions and the credibility of the central bank. For Nigeria, where private investment is hampered by macroeconomic instability and policy unpredictability, adopting inflation targeting could potentially boost investor confidence. However, this would require significant improvements in the institutional and regulatory framework, including central bank independence and fiscal discipline.

**Adler et al. (2021)** examine patterns of foreign exchange intervention in inflation-targeting countries. They argue that central banks in emerging markets often intervene in foreign exchange markets to complement inflation-targeting efforts, especially when faced with high currency volatility. Nigeria's experience aligns with this, as the CBN has frequently intervened in the forex market to stabilize the naira. However, such interventions can sometimes contradict inflation-targeting goals, particularly if they lead to excess liquidity in the market. The study suggests that a balanced approach to exchange rate management is critical for ensuring the success of inflation targeting in volatile economies like Nigeria.

### 3. Methodology

$$\pi_t = \beta_0 + \beta_1 MPR_t + \beta_2 (y_t - y^*) + \beta_3 \ln(M2_t) + \beta_4 \ln(INS_t) + \beta_5 \ln(CBI_t) + \beta_6 \ln(CBNCD_t) + e_t \quad (3)$$

Where;  $i$  is the monetary policy rate (MPR),  $y_t - y^*$  is the output gap, measured by the deviation of actual GDP from potential GDP (RGDP),  $M2_t$  is the broad money supply,  $INS_t$  is the insecurity index, capturing structural supply shocks,  $CBI_t$  is the central bank independence index, reflecting the degree of autonomy in monetary policy,

The study employed annual time series data from 1981 to 2023 to examine the dynamics of inflation targeting framework in Nigeria. The data were sourced from Central Bank of Nigeria (CBN) and the World Bank's World Development Indicators (WDI). Our choice of 1981-2023 period is driven by the need to capture both pre- and post-modern monetary reforms in Nigeria (pre-2004 and post-2004), including different monetary policy frameworks and the ongoing discussions about inflation targeting. We acknowledge that Nigeria is yet to fully adopt inflation targeting a monetary framework, efforts are under way including the bank efforts to increase transparency of its decision to adjust the policy rate. The data consists of The Consumer Price Index (CPI), Monetary Policy Rate (MPR), Real GDP (RGDP), Money Supply (M2), insecurity (proxied by an index of insecurity events), central bank independence (CBI) index, and CBN Communication and Transparency dummy (CBNCD). The CBNCD dummy variable takes a value of 1 during periods when the central bank increases its transparency, a key prerequisite for an effective inflation targeting regime, and 0 for periods when there is no significant enhancement in communication transparency.

To model the effectiveness of the inflation-targeting framework in achieving price stability, the study relied on the Taylor Rule, adjusted within the framework of an Augmented Phillips Curve. The Taylor Rule provides a systematic guideline for adjusting the monetary policy rate in response to deviations in inflation and output from their targets. The basic form of the Taylor Rule is as given in equation (1) which can be rearranged as in (2):

$$i_t = r^* + \pi_t + \alpha(\pi_t - \pi^*) + \gamma(y_t - y^*) \quad (1)$$

$$\pi_t = i_t - r^* - \alpha(\pi_t - \pi^*) - \gamma(y_t - y^*) \quad (2)$$

Now, we expand this relationship by introducing additional variables that capture the specific structural factors relevant to Nigeria's inflation dynamics. These variables include money supply (M2), insecurity index (INS), central bank independence (CBI), and CBN communication and transparency dummy (CBNCD). This results in an Augmented Phillips Curve:

$CBNCD_t$  is a dummy variable for CBN communication and transparency efforts,  $e_t$  is the error term.

In this model, the monetary policy rate (MPR), is expected to have a negative relationship with inflation, so  $\beta_1 < 0$ , as a higher MPR typically reduces inflation by curbing

demand. The output gap ( $y_t - y^*$ ) is also expected to have a negative relationship with inflation, implying  $\beta_2 < 0$ , since a positive output gap (where actual output exceeds potential output) puts an upward pressure on inflation. For money supply  $M2_t$ , the expected relationship is positive, with  $\beta_3 > 0$ , because an increase in the money supply usually raises inflation by adding liquidity to the economy. The insecurity index  $INS_t$  is expected to have a positive relationship with inflation, indicated by  $\beta_4 > 0$ , as higher levels of insecurity typically disrupt supply chains and increase prices, especially for food. The central bank independence index  $CBI_t$  is expected to have a negative relationship with inflation, so  $\beta_5 < 0$ , because higher

central bank independence is associated with more effective and consistent inflation control. Lastly, the CBN communication and transparency dummy  $CBNCD_t$  is also expected to have a negative relationship with inflation, implying  $\beta_6 < 0$ , since better communication helps anchor inflation expectations and enhances monetary policy credibility.

To estimate both the Short- and Long-Term Effects of Inflation Targeting on Inflation control in Nigeria, our study employed dynamic ARDL bounds testing following the work of [Peters et al. \(2020\)](#) and [Pesaran et al. \(2001\)](#) as in equation (4).

$$\begin{aligned} \Delta \ln CPI_t = & \alpha_0 + \sum_{i=1}^q \beta_1 \Delta \ln CPI_{t-i} + \sum_{i=0}^{\rho} \beta_2 \Delta \ln MPR_{t-i} + \sum_{i=0}^{\rho} \beta_3 \Delta \ln RGDP_{t-i} + \sum_{i=0}^{\rho} \beta_4 \Delta \ln M2_{t-i} + \sum_{i=0}^{\rho} \beta_5 \Delta \ln INS_{t-i} \\ & + \sum_{i=0}^{\rho} \beta_6 \Delta \ln CBI_{t-i} + \sum_{i=0}^{\rho} \beta_7 \Delta \ln CBNCD_{t-i} + \varphi_1 \ln CPI_{t-1} + \varphi_2 \ln MPR_{t-1} + \varphi_3 \ln RGDP_{t-1} + \varphi_4 \ln M2_{t-1} \\ & + \varphi_5 \ln INS_{t-1} + \varphi_6 \ln CBI_{t-1} + \varphi_7 \ln CBNCD_{t-1} + \varepsilon_t \quad (4) \end{aligned}$$

All variables are as defined earlier,  $CPI$  capture the inflation rate,  $RGDP$  capture the output gap,  $\ln$  is logarithm function,  $\Delta$  is a first difference operator,  $\rho$  denotes optimal lag, and  $\alpha_0$  is the drift component. The expression with summation sign ( $\beta_1 - \beta_7$ ) represents the short-run dynamics of the model, while the coefficients ( $\varphi_1 - \varphi_7$ )

represents the long-run relationship and  $\varepsilon_t$  is the serially uncorrelated disturbance with zero mean and constant variance. Once it is established that there exists long-run relationship through the application of bounds cointegration test. The long-run relationship of the ARDL model can be estimated as given in equation (5).

$$\begin{aligned} \ln CPI_t = & \varphi_1 \ln CPI_{t-1} + \varphi_2 \ln MPR_{t-1} + \varphi_3 \ln RGDP_{t-1} + \varphi_4 \ln M2_{t-1} + \varphi_5 \ln INS_{t-1} + \varphi_6 \ln CBI_{t-1} + \varphi_7 \ln CBNCD_{t-1} \\ & + \varepsilon_t \quad (5) \end{aligned}$$

While the short-run model can be estimated as given in equation (6) below:

$$\begin{aligned} \Delta \ln CPI_t = & \alpha_0 + \sum_{i=1}^q \beta_1 \Delta \ln CPI_{t-i} + \sum_{i=0}^{\rho} \beta_2 \Delta \ln MPR_{t-i} + \sum_{i=0}^{\rho} \beta_3 \Delta \ln RGDP_{t-i} + \sum_{i=0}^{\rho} \beta_4 \Delta \ln M2_{t-i} + \sum_{i=0}^{\rho} \beta_5 \Delta \ln INS_{t-i} \\ & + \sum_{i=0}^{\rho} \beta_6 \Delta \ln CBI_{t-i} + \sum_{i=0}^{\rho} \beta_7 \Delta \ln CBNCD_{t-i} + \varphi ECM_{t-1} + \varepsilon_t \quad (6) \end{aligned}$$

The Autoregressive Distributed Lag (ARDL) model is suitable for this study because it allows for estimating both short-run and long-run relationships between variables, even if they are integrated into different orders, such as  $I(0)$  and  $I(1)$ . Additionally, the ARDL approach is particularly useful in handling small sample sizes and avoids the need for pre-testing for unit roots as required by other techniques, such as the Vector Error Correction Model (VECM), making it flexible for the dataset used in this study.

#### 4. Result and Discussion

This section presents the result starting with a descriptive statistic. The descriptive statistics presented in Table 1 revealed that while some key variables such as economic growth (RGDP) and money supply (M2) are highly volatile

other series are relatively stable. Specifically, the study revealed that Consumer Price Index (CPI) used to capture inflation has a mean value of 93.0063 with a high standard deviation of 124.2, reflecting significant variability in inflation levels over the period under review. This is further supported by the positive skewness of 1.7799, indicating that the distribution is skewed to the right, meaning that there were instances of extreme inflationary spikes. The Central Bank Independence (CBI) exhibits a mean value of 0.6172 and a very low standard deviation of 0.0244, signifying stability in the level of central bank independence. The skewness of -0.0757 shows a near-symmetric distribution, while the kurtosis of -1.468 indicates that the distribution is platykurtic, meaning it is flatter than the normal distribution and suggests a lack of extreme values. This reflects a relatively stable and

consistent degree of independence for the central bank during the sample period.

The Real Gross Domestic Product (RGDP) has a high mean of 39,919.5879, with a substantial standard deviation of 21,679.19, indicating considerable fluctuations in Nigeria's economic output. The positive

skewness of 0.4868 suggests a slight right skew, meaning that there were instances of higher-than-average GDP levels. The kurtosis of -1.4052 indicates that the distribution is flatter than a normal distribution, reflecting fewer extreme values, which could be attributed to the periodic but not excessively sharp economic growth patterns in the country.

**Table 1: Descriptive Statistics**

Variable	mean	std	Skewness	Kurtosis
CPI	93.0063	124.2	1.7799	2.7171
CBI	0.6172	0.0244	-0.0757	-1.468
RGDP	39919.5879	21679.19	0.4868	-1.4052
M2	10055.1244	14574.8309	1.4089	0.8343
MPR	13.2151	3.995	0.6047	1.1378
INS	5.4033	2.0079	0.7504	-1.1855
CBNCD	0.4186	0.4992	0.33	-1.8911

**Table 2: Stationary Test ADF at level and first difference**

Variables	Level ADF (p-value)	5% Critical Value	First Diff ADF (p-value)	First Diff 5% Critical Value	Order of Integration
CPI	-1.6094 (0.4789)	-2.9512	-3.972 (0.001)	-2.9605	I(1)
CBI	-1.0311 (0.7418)	-2.9333	-6.603 (0.000)	-2.9351	I(1)
RGDP	-0.5849 (0.9872)	-2.9351	-3.647 (0.010)	-2.9351	I(1)
M2	2.1146 (0.9988)	-2.9572	-6.155 (0.000)	-2.9605	I(1)
MPR	-3.2606 (0.0167)	-2.9333	-8.5871 (0.000)	-2.9351	I(0)
INS	-1.4018 (0.5814)	-2.9391	-5.988 (0.030)	-2.9605	I(1)
CBNCD	-0.8213 (0.8128)	-2.9333	-6.4031 (0.000)	-2.9351	I(1)

For the Money Supply (M2), the mean value stands at 10,055.1244 with a large standard deviation of 14,574.8309, suggesting substantial variability in the monetary supply. The skewness of 1.4089 highlights a right-skewed distribution, suggesting that there were periods of significant increases in money supply. The Monetary Policy Rate (MPR) has an average of 13.2151, indicating that Nigeria has maintained relatively high interest rates during the period. With a standard deviation of 3.995, the variability is moderate, implying that the monetary authorities have made adjustments to the rate, but not excessively so. The positive skewness of 0.6047 suggests a rightward skew, indicating the occurrence of occasional higher interest rates.

The Insecurity Index (INS) has a mean of 5.4033 and a standard deviation of 2.0079, indicating moderate variability in insecurity levels. The skewness of 0.7504 shows that there is a slight rightward skew, meaning that there were periods with higher-than-average insecurity

levels. The kurtosis value of -1.1855 suggests a flatter distribution, indicating fewer extreme insecurity events, though the variability indicates insecurity was a recurring issue. Lastly, The CBNCD, which captures the Central Bank of Nigeria's communication and transparency, has a significant negative effect on inflation in both the long run (-4.14,  $p = 0.024$ ) and the short run. This result implies that better communication and transparency by the central bank play a critical role in anchoring inflation expectations and enhancing the credibility of monetary policy. When the central bank effectively communicates its policy goals, strategies, and economic outlook, it helps to stabilize public and market expectations regarding inflation. Improved transparency reduces uncertainty and speculation, which can otherwise contribute to inflation volatility. This finding is consistent with broader literature, including [Ajayi and Ojo \(2015\)](#), which emphasizes the importance of effective central bank communication in managing inflationary expectations.

The results of the Augmented Dickey-Fuller (ADF) test provide information on the stationarity of the variables at both levels and after first differencing. For the Consumer Price Index (CPI), the ADF statistic at the level is -1.6094 with a p-value of 0.4789, which exceeds the 5% critical value of -2.9512. This indicates that CPI is non-stationary at the level. However, after first differencing, the ADF statistic becomes -3.972 with a p-value of 0.001, which is below the 5% critical value of -2.9605, demonstrating that CPI achieves stationarity at the first difference. CBI is also non-stationary at the level, with an ADF statistic of -1.0311 (p-value = 0.7418). After first differencing, the statistic improves to -6.603 (p-value = 0.000), confirming that CBI is stationary at I(1).

Similarly, RGDP is non-stationary at the level with an ADF statistic of -0.5849 (p-value = 0.9872) but becomes stationary after first differencing, with an ADF statistic of -3.647 (p-value = 0.010), making it I(1). M2 is non-stationary at the level (ADF = 2.1146, p-value = 0.9988) but becomes stationary at I(1) after first differencing (ADF = -6.155, p-value = 0.000). MPR, unlike other variables,

is stationary at the level with an ADF statistic of -3.2606 (p-value = 0.0167), indicating it is I(0). Again, INS is non-stationary at the level (ADF = -1.4018, p-value = 0.5814) but stationary after first differencing (ADF = -5.988, p-value = 0.030), making it I(1). Finally, CBNCD is non-stationary at the level (ADF = -0.8213, p-value = 0.8128) but stationary after first differencing (ADF = -6.4031, p-value = 0.000), indicating it is I(1).

Given that the series are fractionally integrated of order zero and one, there is a potential risk of losing valuable long-run information about the time series. To address this, a cointegration test is necessary to determine whether a long-run relationship exists among the variables in each model. Following the recommendations of [Enders \(2010\)](#) and [Pesaran \(2001\)](#), three key diagnostic tests were conducted: the bounds cointegration test to confirm the presence of a long-run relationship, the Breusch-Godfrey Serial Correlation test to check for autocorrelation in the residuals, and the CUSUM square test to assess the stability of the model over time.

**Table 3: ARDL Models for Monetary Policy in Nigeria**

Variable	CPI	Inflation rate (inf)
<b>Bounds F-Stats</b>	7.672***	6.849***
<b>LONG - RUN</b>		
Lag(-1)	0.946(0.003)***	0.751 (0.0212)***
MPR	-0.338 (0.004)***	-0.314 (0.008)***
LM2	0.7103 (0.003)***	0.6803 (0.009)***
Lnrgdp	-0.079 (0.968)	-0.046 (0.329)
INS	0.211 (0.006)***	0.192 (0.004)***
CBI	-22.22 (0.002)***	-11.25 (0.003)***
CBNCB	-4.14 (0.024)**	-0.278 (0.043)**
C	-34.42 (0.032)**	-25.53 (0.039)
R <sup>2</sup>	0.965	0.941
F*(p-value)	0.0000***	0.0000***
Breusch-g	0.255	0.328
<b>SHORT - RUN</b>		
Lag(-1)	0.836 (0.003)***	0.681 (0.002)***
MPR	-0.381 (0.000)***	-0.289 (0.002)***
LM2	0.673 (0.013)***	0.613 (0.014)***
Lnrgdp	-0.175 (0.638)	-0.116 (0.429)
INS	0.324 (0.002)***	0.218 (0.002)***
CBI	-13.31 (0.042)**	-8.25 (0.002)***
CBNCB	-4.52 (0.024)**	-0.358 (0.043)**
C	12.40 (0.000)***	-11.89 (0.045)
ECM(-1)	-0.8934 (0.000)***	-0.7883 (0.000)***

R <sup>2</sup>	0.9566	0.9271
F*(p-value)	0.0000	0.0000***
Breusch-g	0.619	0.1344

Significance is indicated as follows: \*\*\*, \*\* and \* for 1%, 5% and 10% respectively, p-value in parenthesis.

The results of the ARDL model for the Consumer Price Index (CPI) provide meaningful insights into the dynamics of inflation in Nigeria and align with key findings in the literature on monetary policy and inflation targeting. The bounds F-statistic of 7.672, significant at the 1% level, suggests the existence of a long-run equilibrium relationship between inflation and its determinants, confirming the importance of considering both short- and long-term factors when analyzing inflation in the Nigerian economy. This finding supports the argument made by [Pesaran et al. \(2001\)](#) that an ARDL approach is appropriate when variables are integrated of different orders. In the long run, the Monetary Policy Rate (MPR) has a statistically significant negative effect on CPI, with a coefficient of -0.338 ( $p = 0.004$ ). This aligns with traditional economic theory, such as the Taylor Rule, which posits that higher interest rates help to reduce inflation by curbing demand. This result also resonates with earlier findings by [Adebiyi and Olowookere \(2012\)](#), who noted the effectiveness of contractionary monetary policy in reducing inflation in developing economies. The strong negative impact of MPR on inflation reflects the importance of monetary tightening in Nigeria, a country often characterized by inflationary pressures due to structural issues such as supply constraints and demand-side pressures.

The money supply (M2) exhibits a positive and significant relationship with CPI in the long run, with a coefficient of 0.7103 ( $p = 0.003$ ), consistent with the Quantity Theory of Money proposed by Milton Friedman, which suggests that an increase in money supply leads to inflation if not accompanied by corresponding increases in output. This result echoes the findings of [Masha \(2011\)](#) and [Akinbobola \(2012\)](#), who observed that monetary expansions in Nigeria have historically contributed to inflationary pressures. The positive impact of M2 highlights the importance of controlling liquidity in the economy to achieve price stability. Interestingly, real GDP (RGDP) does not have a statistically significant effect on inflation, both in the long run ( $-0.079$ ,  $p = 0.968$ ) and in the short run. This result deviates from the expectations of Phillips Curve theory, which suggests a trade-off between inflation and economic output. The insignificant impact of RGDP may reflect the structural issues in Nigeria's economy, such as the heavy reliance on oil exports and the underperformance of non-oil sectors, which limit the effectiveness of GDP growth in curbing inflation. Similar findings were reported by Adekunle and Bolarinwa

(2015), who found that Nigeria's inflation dynamics are more responsive to monetary factors than real economic growth.

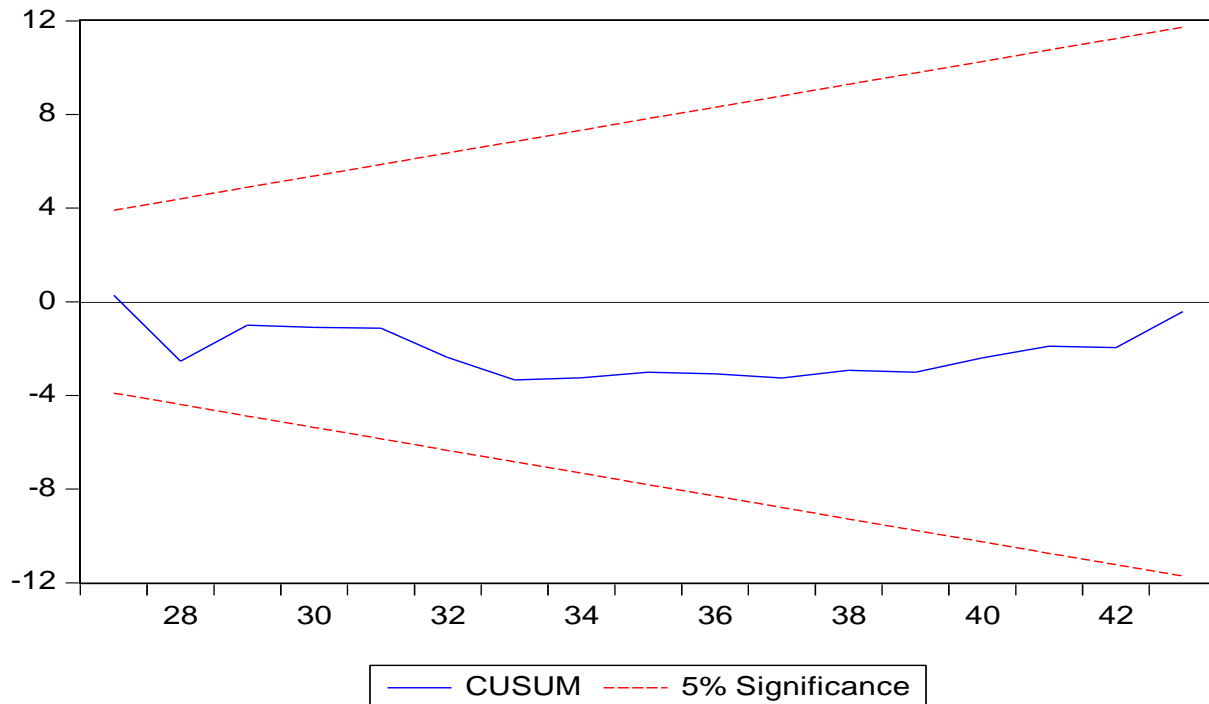
The significant positive relationship between insecurity (INS) and inflation (0.211,  $p = 0.006$  in the long run) highlights the inflationary impact of insecurity in Nigeria. Higher insecurity disrupts economic activities, leading to supply-side constraints and increasing prices. This finding is consistent with the work of [Eze and Ogiji \(2016\)](#), who argued that insecurity, particularly in the form of insurgency and political instability, exacerbates inflationary pressures by reducing the productivity of key sectors like agriculture and manufacturing. Another critical result is the significant and negative effect of Central Bank Independence (CBI) on inflation ( $-22.22$ ,  $p = 0.002$ ). This supports the argument made by [Alesina and Summers \(1993\)](#) and more recently by [Amusa and Ofuya \(2017\)](#), who found that greater central bank independence is associated with lower inflation rates. The negative impact of CBI reflects the importance of insulating the Central Bank of Nigeria from political pressures, allowing it to focus on maintaining price stability as its primary objective. This result underlines the critical role of institutional quality in influencing inflation outcomes, which has been emphasized in the literature on developing economies.

The Central Bank Non-Consolidated Deposits (CBNCB) variable also has a significant negative effect on inflation in both the long run ( $-4.14$ ,  $p = 0.024$ ) and the short run. This result suggests that the central bank's liquidity management strategies, such as absorbing excess reserves through non-consolidated deposits, play a vital role in controlling inflation. This aligns with [Ajayi and Ojo \(2015\)](#), who highlighted the importance of effective liquidity management in curbing inflationary pressures in Nigeria.

In the short run, the dynamics of inflation follow a similar pattern. The MPR remains a significant tool for controlling inflation, with a stronger short-run impact ( $-0.381$ ,  $p = 0.000$ ), reflecting the responsiveness of inflation to immediate monetary policy actions. The money supply (M2) continues to be inflationary, with a coefficient of 0.673 ( $p = 0.013$ ), underscoring the need for the Central Bank of Nigeria to closely monitor liquidity levels. The positive relationship between insecurity (INS) and

inflation persists in the short run ( $0.324, p = 0.002$ ), further emphasizing the destabilizing effect of insecurity on price stability. Additionally, the significant negative effect of CBI and CBNCB on inflation in the short run reinforces the importance of maintaining an independent central bank and managing liquidity effectively. The error correction term (ECM) of  $-0.8934$  ( $p = 0.000$ ) indicates that

approximately 89% of any deviation from the long-run equilibrium is corrected in the next period, suggesting a relatively fast adjustment process. This result is consistent with the findings of [Pesaran et al. \(2001\)](#), who highlighted the ability of the ARDL approach to capture both short-term dynamics and long-term relationships in the presence of cointegration.



The CUSUM stability test plot indicates that the cumulative sum of recursive residuals (blue line) lies within the 5% significance bounds (red dashed lines). Since the CUSUM line does not cross the critical bounds, this suggests that the model is stable over the sample period. Stability in this context implies that the model's parameters remain consistent and do not experience significant structural breaks. Moreover, the Breusch-Godfrey Serial Correlation test, the reported p-values in the ARDL result (Breusch-Godfrey  $p = 0.255$  for CPI) indicate that the null hypothesis of no serial correlation cannot be rejected at conventional significance levels. This means there is no evidence of serial correlation in the residuals, suggesting that the model's residuals are uncorrelated over time, which is a desirable property for model validity.

### **Inflation Targeting Challenges and Opportunities**

The findings of this study reflect several key challenges faced by developing countries, such as Nigeria, in adopting inflation targeting as a framework for achieving price stability. One of the most consistently identified issues in literature is the presence of weak institutions. Institutional weaknesses, particularly the lack of central bank independence and limited policy credibility, lead to trust deficits, which hinder the effective anchoring of inflation expectations. The study's results demonstrate that greater central bank independence (CBI) significantly reduces inflation in both the short and long run, emphasizing the importance of an autonomous monetary authority. However, Nigeria, like many other developing countries, struggles to maintain such independence, increasing public and market distrust in the central bank's commitment to controlling inflation. Addressing these trust issues by enhancing central bank independence would improve public confidence in the central bank's policies, thereby increasing the effectiveness of the inflation targeting framework in controlling inflation in Nigeria.

Furthermore, structural rigidities pose additional challenges to inflation control in developing economies. The study's findings, particularly the insignificance of real GDP (RGDP) in affecting inflation, suggest that economic growth alone does not directly contribute to inflation management, contrary to common belief in literature. This highlights the difficulties faced by economies with structural constraints, such as heavy dependence on commodities, a large informal sector, and insufficient economic diversification. In such environments, inflation is influenced not just by monetary factors but also by supply-side bottlenecks, inadequate infrastructure, and sectoral imbalances, all of which diminish the efficacy of inflation targeting regimes. In addition, the significant positive effect of insecurity on inflation in both the short run and long run underscores the role of non-monetary factors in influencing price stability. Insecurity, as a structural factor, exacerbates inflation by disrupting supply chains and economic activities, making it more difficult for monetary policy to achieve its inflation objectives. Since monetary policy has little direct influence on such structural issues, they present a formidable obstacle to the effectiveness of inflation targeting.

Despite these challenges, the study also highlights the opportunities that inflation targets present for developing economies. The significant role of central bank transparency, captured by the CBNCD variable, demonstrates how enhanced communication and transparency can anchor inflation expectations, improve policy credibility, and promote price stability. This shows that, even in contexts of structural and institutional challenges, better transparency and communication can make inflation targeting more effective by improving public trust in the central bank's actions. Moreover, the stabilization of inflation expectations through such measures creates a more predictable monetary environment, which can support broader economic growth by providing businesses and investors with greater confidence in price stability over the long term.

## 5. Conclusion and Policy Implications

The objective of this study was to assess the short- and long-term impact of inflation targeting on inflation control in Nigeria, and the findings indicate that this objective has been successfully achieved. Using the ARDL approach, the study confirms the existence of a long-run relationship between the Consumer Price Index (CPI) and key

macroeconomic variables such as the Monetary Policy Rate (MPR), money supply (M2), real GDP (RGDP), insecurity (INS), central bank independence (CBI), and Central Bank Non-Consolidated Deposits (CBNCB). The results demonstrate that monetary policy plays a critical role in both the short and long run. Specifically, the MPR is found to have a significant negative effect on inflation, underscoring the effectiveness of interest rate adjustments in curbing inflationary pressures. Similarly, the money supply positively impacts inflation, consistent with the Quantity Theory of Money. The findings also reveal that insecurity has a significant inflationary impact, highlighting the role of non-monetary factors in driving price instability in Nigeria. Furthermore, the study underscores the importance of central bank independence in maintaining low inflation levels, reinforcing the need for institutional autonomy in monetary policymaking.

The speed of adjustment, as reflected by the error correction model (ECM), suggests that inflationary shocks are quickly corrected, with approximately 89% of deviations from the long-run equilibrium being corrected within a period. Overall, the study's findings align with existing literature, validating the relevance of inflation-targeting policies in Nigeria and the importance of both monetary and non-monetary interventions in managing inflation. The study's results suggest several key policy implications for controlling inflation in Nigeria:

The significant impact of the Monetary Policy Rate (MPR) highlights the importance of maintaining a vigilant stance on interest rate adjustments to manage inflation effectively. The Central Bank of Nigeria (CBN) should continue to use MPR as a primary tool for inflation targeting. Moreover, the positive relationship between money supply (M2) and inflation suggests that the CBN must implement stringent liquidity management strategies to prevent excessive monetary expansion, such as open market operations and reserve requirements. Given the significant inflationary effect of insecurity, policymakers should prioritize improving national security to stabilize both inflation and economic productivity. Addressing insecurity is essential for mitigating supply-side disruptions that fuel inflation. The strong negative effect of central bank independence on inflation reinforces the need to protect the CBN's autonomy. Strengthening the legal and institutional framework that ensures CBN's independence will enhance its ability to implement effective inflation-targeting policies.

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