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THE PARADOX OF INFLATION-TARGETING IN NIGERIA: AN EMPIRICAL INVESTIGATION OF PERSISTENT HIGH INFLATION RATES DESPITE THE PRUDENT MONETARY POLICY

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ABSTRACT----------
The paradox of inflation-targeting refers to persistence of high inflation rates despite the implementation of prudent monetary policies aimed at price stabilization. This study investigates this paradox in Nigeria by analyzing historical inflation data from 1960 to 2023 using an autoregressive moving average (ARMA) modeling approach. Utilizing time-series data from the World Bank, inflation (consumer prices, annual %) is modeled as the dependent variable, while autoregressive (AR) and moving average (MA) components serve as independent variables. Parameter estimation using conditional least squares (CLS) reveals that the AR(1) coefficient (0.817480) is positive and statistically significant, indicating that approximately 82% of past inflationary effects persist over time. Meanwhile, the MA(2) coefficient (-0.448447) is negative and statistically significant, suggesting that about 45% of past shocks contribute to short-term inflation adjustments. The estimated ARMA(1,2) model is found to be covariance stationary and invertible, confirming its reliability for forecasting inflation trends. Projections indicate a gradual decline in inflation, with rates expected to decrease from 22.7% in 2024 to approximately 17.7% by 2045. However, this reduction remains marginal, as inflation rates persist in double digits, highlighting the limitations of inflation-targeting policies in achieving long-term price stability. The study recommends integrating inflation-targeting with broader fiscal and structural reforms to enhance monetary policy effectiveness and ensure sustainable inflation control in Nigeria.

KEY WORDS: *ARMA modeling, Inflation-Targeting, Monetary Policy, Inflation Persistence, Nigeria*----------

INTRODUCTION

Inflation-targeting has been widely adopted by central banks as a monetary policy framework to achieve price stability and economic growth. The primary objective is to maintain inflation within a target range, thereby ensuring macroeconomic stability and fostering investor confidence (Bernanke et al., 2001). However, in Nigeria, despite the implementation of inflation-targeting strategies, inflation rates have remained persistently high, raising concerns about the effectiveness of monetary policy in curbing inflationary pressures (Ozili, 2024). This paradox where inflation remains elevated despite prudent monetary policy calls for an empirical investigation into the underlying factors contributing to inflation persistence in Nigeria.

Nigeria has historically grappled with high inflation, driven by structural inefficiencies, exchange rate volatility, fiscal imbalances, and external shocks (Oladipo, et al. 2024). The Central Bank of Nigeria (CBN) has adopted inflation-targeting measures, yet inflation remains stubbornly high, often exceeding the target range (CBN, 2022). This persistent inflation undermines purchasing power, erodes real incomes, and creates uncertainty in the economy.

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Understanding the dynamics of inflation persistence is crucial for policymakers seeking to design more effective inflation-containment strategies.

This study is necessary given the critical role inflation plays in shaping economic performance. Persistent high inflation can distort investment decisions, widen income inequality, and reduce economic growth potential (Blanchard, 2021). While previous studies have examined inflation determinants in Nigeria, there is limited empirical research focusing on the effectiveness of inflation-targeting using time-series econometric modeling. By employing an Autoregressive Moving Average (ARMA) approach, this study aims to provide a comprehensive analysis of Nigeria's inflation trends and assess whether inflation persistence is a structural or policy-driven phenomenon. The findings offer insights for policymakers on refining inflation-targeting strategies to enhance price stability and economic resilience.

LITERATURE REVIEW

Inflation-targeting has been widely debated in economic literature, particularly regarding its effectiveness in stabilizing prices and fostering economic growth. While developed economies have successfully used inflation-targeting to achieve price stability, emerging economies, including Nigeria, continue to experience persistent high inflation despite adopting similar monetary policies. This literature review critically examines existing studies on inflation-targeting from global, regional, and local perspectives. It also explores the theoretical and conceptual frameworks underpinning inflation persistence in Nigeria.

Inflation-targeting was first adopted by New Zealand in 1990 and has since been implemented in over 30 countries, including the United Kingdom, Canada, and South Korea (Bernanke et al., 2001). Studies have shown that inflation-targeting has contributed to lower inflation volatility and enhanced economic stability in developed economies (Bernanke et al., 2001). Svensson (1998) argues that inflation-targeting enhances central bank credibility and anchors inflation expectations. However, critics such as Stiglitz (2008) contend that inflation-targeting alone is insufficient for emerging economies due to structural rigidities, supply-side shocks, and external vulnerabilities.

Several African countries, including South Africa, Ghana, and Uganda, have adopted inflation-targeting frameworks with mixed outcomes. South Africa's adoption of inflation-targeting in 2000 led to moderate inflation reductions, but economic growth remained sluggish due to structural constraints (Kotsokoane & Rena, 2021). In Ghana, average inflation and inflation volatility were lower during the post-inflation-targeting period compared with the pre-inflation-targeting period (Mohammed, et al. 2016). Studies suggest that African economies often struggle with inflation persistence due to weak financial markets, heavy dependence on commodity exports, and policy inconsistencies (Heintz & Ndikumana, 2010).

In Nigeria, inflation has remained a persistent challenge despite the Central Bank of Nigeria (CBN) implementing inflation-targeting strategies. Studies indicate that inflation is largely driven by structural inefficiencies, exchange rate volatility, and fiscal policy misalignment (Oladipo, et al. 2024). According to CBN (2022), inflation has consistently exceeded target ranges, with food and energy price shocks exacerbating inflationary pressures. Okonjo-Iweala & Osafo-Kwaako (2007) highlights that monetary policy alone cannot control inflation in Nigeria without complementary fiscal and structural reforms.

This study is anchored on the Monetary Policy Theory, which posits that central banks can influence inflation through interest rates and money supply regulation (Friedman, 1968). The study also draws from the Phillips Curve Theory, which suggests an inverse relationship between inflation and unemployment (Phillips, 1958). However, empirical evidence from Nigeria challenges this traditional view, as high inflation persists despite monetary tightening. The New Keynesian Theory further explains inflation persistence through price stickiness and expectations-driven inflation (Woodford, 2005).

The conceptual framework for this study revolves around inflation persistence and the role of monetary policy in controlling inflation. The dependent variable is inflation (consumer prices, annual %), while the independent variables are the Autoregressive (AR) and Moving Average (MA) components, which capture past inflation trends and short-term adjustments, respectively. Several studies have applied Autoregressive Moving Average (ARMA) models to analyze inflation dynamics. For instance, Nahabwe & Kagarura (2025) successfully utilized Autoregressive Integrated Moving Average (ARIMA) models to examine inflation rates in Uganda, demonstrating that past inflation significantly influences current inflation levels. Similarly, Bernanke et al. (2001) highlighted the effectiveness of time-series models in forecasting inflation trends and assessing the impact of monetary policy interventions. Additionally, Svensson (1998) argued that inflation persistence often arises due to slow price adjustments and expectations-driven inflation, factors that ARMA models can effectively capture.

DATA AND METHODS

This study adopts a quantitative research design, employing time-series econometric modeling to investigate the paradox of inflation-targeting in Nigeria. Specifically, the study applies the Autoregressive Moving Average (ARMA) model, which is widely used for analyzing economic and financial time-series data due to its ability to capture inflation persistence and short-term fluctuations (Box & Jenkins, 1976; Nahabwe & Kagarura, 2025). Given that inflation dynamics are influenced by past values and stochastic shocks, the ARMA framework provides a robust approach to understanding the effectiveness of monetary policy in Nigeria (Enders, 2014; Nahabwe & Kagarura, 2025).

The study utilizes secondary data sourced from the World Development Indicators (WDI) database for the period 1960-2023. The dataset includes annual inflation rates (consumer prices, annual %) as the dependent variable, while the Autoregressive (AR) and Moving Average (MA) components serve as the independent variables. The selection of this dataset is justified by its comprehensive coverage, reliability, and consistency in measuring macroeconomic indicators across time (World Bank, 2023). A purposive sampling technique is employed, as the study specifically focuses on Nigeria's inflation trends within the given timeframe.

The study utilizes an ARMA(p,q) model, where p represents the number of autoregressive (AR) terms, and q denotes the number of moving average (MA) terms. The model is specified as follows:

$$Y_t = c + \sum_{i=1}^{p} \boldsymbol{\phi}_i Y_{t-i} + \sum_{j=1}^{q} \theta_j \varepsilon_{t-j} + \varepsilon_t \quad \ldots\ldots (1)$$

Where;
Y_t is Unemployment rate at time t
c is constant term
ε_t is white noise at time t
$\boldsymbol{\phi}_i$ are the coefficients of the autoregressive terms
θ_j are the coefficients of the moving average terms
p = Number of lagged AR terms
q = Number of lagged MA terms (Box & Jenkins 1976; Nahabwe & Maniple, 2025)

The model parameters are estimated using conditional least squares (CLS) method, employing Gauss-Newton/Marquardt steps for optimization. The CLS method minimizes the sum of squared residuals and provides efficient parameter estimates, particularly in the presence of autocorrelation and heteroskedasticity (Hamilton, 1994; Nahabwe & Kagarura, 2025). The Gauss-Newton/Marquardt algorithm is suitable for non-linear optimization problems, ensuring convergence to a local minimum and improving estimation accuracy (Marquardt, 1963).

The CLS estimator for the regression coefficients is given by the following formula:

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$$\hat{\theta} = \underset{\theta}{\operatorname{argmin}}[\sum_{t=1}^{n}(y_t - \hat{y}_t(\theta))^2] \quad \ldots\ldots (2)$$

Where:
$\hat{\theta}$ represents the estimated parameter vector (which includes both AR and MA parameters in ARIMA).
y_t represents the actual observed value of the dependent variable at time t
$\hat{y}_t(\theta)$ represents the model's predicted value at time t based on the parameter estimates θ
n is the number of observations. (Hamilton, 1994; Kagarura & Nahabwe, 2025).

Model selection is guided by the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) to ensure the best-fitting model with minimal forecast errors (Lütkepohl, 2005; Nahabwe & Kagarura, 2025). The model's stationarity is verified using the Augmented Dickey-Fuller (ADF) test (Dickey & Fuller, 1979; Nahabwe & Maniple, 2025), covariance stationarity and invertibility conditions are assessed to confirm the reliability of the estimated parameters (Nahabwe & Kagarura, 2025). The choice of the ARMA model is justified by its ability to analyze inflation persistence while accounting for short-term fluctuations caused by macroeconomic shocks. Given Nigeria's history of inflation volatility, ARMA models provide a suitable framework for understanding inflationary trends and forecasting future inflation trajectories (Stock & Watson, 2011). Furthermore, the use of CLS estimation ensures efficiency in parameter estimation, making it appropriate for time-series data with potential autocorrelation issues (Gujarati & Porter, 2009; Nahabwe & Kagarura, 2025).

RESULTS

This section presents the results of the study, guided by the research objectives. The findings are analyzed using descriptive statistics and the estimated Autoregressive Moving Average (ARMA) model. The objective is to assess the persistence of inflation in Nigeria and evaluate the effectiveness of monetary policy in achieving price stability.
The mean inflation rate of 15.99% suggests that, on average, Nigeria has experienced moderate to high inflation over the period. The median value (12.16%) indicates that inflation has often been lower than the mean, pointing to the influence of extreme values or inflationary spikes.

The maximum inflation rate (72.84%, 1995) reflects hyperinflationary periods, while the minimum inflation rate (-3.73%, 1967) suggests that deflationary episodes have also occurred. The standard deviation (14.95%) indicates significant volatility in inflation rates over the study period, highlighting periods of macroeconomic instability (Hamilton, 1994; Nahabwe & Kagarura, 2025).

The skewness value (1.98) reveals a positive skew, meaning the inflation data is asymmetrically distributed with a longer right tail. This suggests that extreme inflationary episodes have been more frequent than extreme deflationary events. The kurtosis (6.83) indicates a leptokurtic distribution, meaning that inflation data exhibits heavier tails than a normal distribution, implying frequent extreme inflationary shocks (Gujarati & Porter, 2009; Nahabwe & Kagarura, 2025).

The Jarque-Bera statistic (81.07) with a probability value of 0.0000 strongly rejects the null hypothesis of normality. This confirms that Nigeria's inflation data does not follow a normal distribution, justifying the use of ARMA modeling techniques to account for inflation persistence (Enders, 2014; Nahabwe & Kagarura, 2025).

Stationarity test (Appendix 2) is conducted using the Augmented Dickey-Fuller (ADF) test to assess the stationarity of the series. Results show that the original series is stationary at the level form ($p < 0.05$), justifying the use of ARMA model (Nahabwe & Kagarura, 2025).

The ARMA(1,2) model is selected as the most suitable based on the Akaike Information Criterion (AIC = 7.679380) and Schwarz Criterion (SC = 7.781434). The parameter estimates are as follows: AR(1) = 0.817480 (p = 0.0000),

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MA(2) = -0.448447 (p = 0.0020), and the constant term C= 17.66421 (p = 0.0001). This indicates that the coefficients of AR(1), MA(2) and the constant term are all statistically significant. Diagnostic tests confirm the model's reliability, as the residuals exhibit white noise properties, validated by the Ljung-Box Q test (p > 0.05). Additionally, the autocorrelation function (ACF) plots reveal no significant patterns, reinforcing the model's robustness (Nahabwe & Kagarura, 2025; Nahabwe & Maniple, 2025).

Inferential statistics are summarized as follows:
Results of the ARMA(1,2) model (Appendix 3)
$\widehat{Inflation_t}$ = 17.66421 + 0.817480AR(1) - 0.448447 MA(2) …..... (3)

Hence,
$\hat{\theta}_{CLS} = \begin{bmatrix} 17.66421 \\ 0.817480 \\ -0.448447 \end{bmatrix}$

Constant Term (C = 17.66421) is positive and statistically significant (p = 0.0001) suggesting that Nigeria's baseline inflation remains persistently high even in the absence of external shocks. This finding supports the argument that structural and supply-side constraints contribute significantly to Nigeria's inflationary pressures (Oladipo, et al. 2024). AR(1) Coefficient (0.817480): The positive and statistically significant autoregressive coefficient (p = 0.0000) indicates that approximately 82% of past inflation carries over into the current period. This confirms the strong inflation inertia in Nigeria, implying that inflationary trends are highly persistent over time (Enders, 2014; Nahabwe & Kagarura, 2025). MA(2) Coefficient (-0.448447): The negative and statistically significant moving average coefficient (p = 0.0020) suggests that approximately 45% of past inflationary shocks are absorbed and reversed within two periods. This means that temporary inflation spikes do not last indefinitely, but the adjustment process remains slow and inefficient (Gujarati & Porter, 2009; Nahabwe & Kagarura, 2025).

Adjusted R-Squared (0.463371) implies that 46.34% of the variation in inflation is explained by the AR and MA components. While this indicates a moderate explanatory power, it also suggests that other macroeconomic variables such as exchange rate volatility, fiscal policy, and global commodity prices may significantly influence inflation in Nigeria (Hamilton, 1994; Nahabwe & Kagarura, 2025; Nahabwe, et al. 2025). Durbin-Watson Statistic (1.949700) is near-ideal value of 2 suggests that no significant autocorrelation exists in the residuals, confirming that the ARMA(1,2) model is correctly specified and reliable for forecasting purposes (Stock & Watson, 2011; Nahabwe & Kagarura, 2025).

To assess the robustness of the model, a histogram of residuals and statistical tests for normality and independence were conducted: Histogram of Residuals (Kurtosis = 5.7) is relatively high suggesting that inflationary shocks in Nigeria exhibit fat-tailed distributions, meaning extreme inflationary events occur more frequently than in a normal distribution (Lütkepohl, 2005; Nahabwe & Kagarura, 2025). Jarque-Bera Test (JB = 32; p = 0.2772) indicates that the null hypothesis of normality cannot be rejected, suggesting that the residuals follow a reasonably normal distribution (Enders, 2014; Nahabwe & Kagarura, 2025). Ljung-Box Q Statistic (p = 0.458) is high confirming that there is no significant autocorrelation in the residuals, implying that the model sufficiently captures inflation dynamics and past values do not systematically bias future predictions (Hamilton, 1994; Nahabwe & Kagarura, 2025).

ARMA(1,2) structure (Appendix 4) confirms that all AR and MA roots lie within the unit circle, meaning that the model is covariance stationary and invertible hence suitable for long-term forecasting (Nahabwe & Kagarura, 2025). The forecasting results indicate a gradual decline in inflation, with rates expected to decrease from 22.7% in 2024 to approximately 17.7% by 2045. However, this reduction is marginal, as inflation is projected to remain in double digits for the next two decades, highlighting the limitations of monetary policy alone in addressing inflation in Nigeria.

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DISCUSSION

This section compares the study's findings with previous empirical literature, highlighting both consistencies and divergences. The discussion further contextualizes the results within Nigeria's macroeconomic environment, emphasizing the unique contributions of this study.

The findings confirm the persistent nature of inflation in Nigeria, aligning with prior studies on inflation dynamics in developing economies. The high autoregressive coefficient (AR(1) = 0.817480, p = 0.0000) indicates strong inflation persistence, consistent with the findings of Kamin (1997), who documented similar inflationary inertia in emerging markets due to weak monetary transmission mechanisms. Similarly, Ekong & Effiong (2020) argued that inflation persistence in developing countries often results from structural rigidities, policy inconsistencies, and external shocks, all of which are evident in Nigeria.

The negative and statistically significant moving average coefficient (MA(2) = -0.448447, p = 0.0020) suggests that inflation shocks eventually dissipate, although the adjustment process is slow. This result is comparable to Mishra & Montiel (2012), who found that inflation shocks in developing economies tend to be absorbed over multiple periods but remain elevated due to supply-side constraints and currency depreciation. Additionally, Ball & Sheridan (2004) found that inflation-targeting regimes in developing nations often fail to fully contain inflation due to structural factors such as import dependency, exchange rate volatility, and weak institutional frameworks.

Despite Nigeria's formal adoption of inflation-targeting principles through its monetary policy framework (Ekong & Effiong, 2020), the study's findings indicate that these policies have not significantly reduced inflation to single-digit levels over time. This contradicts the findings of Svensson (1998), who demonstrated that inflation-targeting frameworks in advanced economies significantly reduce inflation volatility. However, Roger (2010) and Mishra & Montiel (2012) noted that in low-income economies, inflation-targeting is often less effective due to structural constraints, weak central bank credibility, and fiscal dominance.

The forecasting results further reinforce the limitations of Nigeria's monetary policy in achieving long-term price stability. The projection that inflation will remain above 10% until at least 2045 is consistent with Fischer, et al. (2002), who found that inflation stabilization efforts in developing economies tend to yield only marginal improvements without complementary fiscal and structural reforms.

This study contributes to the literature by providing empirical evidence of the paradox of inflation-targeting in Nigeria where inflation remains persistently high despite the adoption of monetary policy frameworks aimed at stabilization. The unique findings of this research include: Unlike advanced economies where inflation-targeting frameworks have been effective (Svensson, 1998), the study finds that monetary policy alone has been insufficient in Nigeria. This suggests that inflation in Nigeria is driven by non-monetary factors such as fiscal excesses, exchange rate misalignment, and structural inefficiencies.

The high AR(1) coefficient indicates that inflation is highly persistent, meaning that past inflation significantly influences future inflation. This finding aligns with Cecchetti & Debelle (2005), who argued that policy lags in inflation control are more pronounced in economies with weak financial markets and fiscal dominance. The persistence of high inflation, despite prudent monetary policies, suggests that supply-side factors such as high production costs, import dependency, Ekong & Effiong (2020) and Kamin (1997), who emphasized the role of supply-side bottlenecks in inflation dynamics in emerging markets.

The study's forecasts suggest that inflation will remain in double digits until at least 2045, even under current policy conditions. This contradicts the "convergence hypothesis" of inflation-targeting, which suggests that inflation should steadily decline over time in a well-functioning monetary system (Ball & Sheridan, 2004). Instead, the findings suggest

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that Nigeria's inflation dynamics exhibit long-run persistence, requiring multi-faceted interventions beyond monetary policy alone.

LIMITATIONS

While this study provides valuable insights into the persistent high inflation rates in Nigeria despite the adoption of inflation-targeting policies, it is not without limitations. These limitations pertain to the research design, sample selection, data sources, and analytical procedures. Acknowledging these limitations is crucial for a comprehensive understanding of the study's findings and the interpretation of its results.

One of the key limitations of this study is the focus on a single country, Nigeria. While Nigeria provides an interesting case for examining the paradox of inflation-targeting, the findings may not be directly applicable to other countries with different economic structures, institutional frameworks, and inflation dynamics. As Beck et al. (2009) point out, inflation dynamics and the effectiveness of monetary policies vary widely across countries, especially in low- and middle-income nations. Therefore, caution is needed when generalizing the results to other developing economies.

Furthermore, this study primarily emphasizes the monetary policy perspective and does not consider other economic and political factors, such as fiscal policy, global commodity price shocks, and geopolitical risks, which could influence inflation in Nigeria. While monetary policy plays a significant role in managing inflation, the complex nature of inflation requires a holistic approach that incorporates multiple facets of economic policy (Ekong & Effiong, 2020).

This study utilizes secondary data from the World Development Indicators (1960-2023), which provides comprehensive and reliable macroeconomic data. However, there are a few limitations inherent in this dataset. First, data availability and consistency may pose challenges, particularly for earlier periods (1960-1980), where inflation data may be incomplete or unreliable. As Stock & Watson (2002) note, data quality issues can distort the findings of time-series analyses, especially in the case of long historical periods. While the dataset is robust, any missing or incomplete data could introduce biases into the estimation results.

Another limitation is the time period of the analysis. Although this study covers a significant period from 1960 to 2023, the analysis may overlook recent developments and emerging trends in Nigeria's inflation dynamics. Structural changes in the Nigerian economy, such as oil price shocks, fiscal reforms, and financial liberalization, may have significantly altered inflation patterns in recent years (Oyaromade & Olubusoye, 2007). Therefore, the study's conclusions might not fully capture the impact of recent policy changes or external shocks.

Moreover, the study's narrow focus on inflation as the sole dependent variable limits the scope of analysis. Other factors, such as economic growth, exchange rates, or unemployment, could also influence inflation and should ideally be included in a more comprehensive model of inflation dynamics (Blanchard, 2021). Including these variables would offer a more nuanced understanding of the causes of persistent inflation in Nigeria.

The study uses Autoregressive Moving Average (ARMA) models to analyze inflation trends. While ARMA models are widely used in time-series analysis and are suitable for capturing autoregressive and moving average components of inflation, the choice of ARMA has limitations. For instance, ARMA models assume stationarity, which might not always hold in the presence of structural breaks or non-linear relationships in the data (Enders, 2014; Nahabwe & Kagarura, 2025). Non-stationarity could lead to spurious results and misleading conclusions if not properly addressed. Although the study employed Conditional Least Squares (CLS) to estimate parameters, the underlying assumption of stationarity may still undermine the validity of the results. Future studies could consider alternative methodologies, such as cointegration or structural break analysis, which account for potential non-stationarity and structural changes in inflation dynamics (Johansen, 1995).

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Additionally, the ARMA model employed in this study does not account for external shocks or global factors that could influence Nigeria's inflation, such as fluctuations in global oil prices or international trade shocks. As Oyaromade & Olubusoye, (2007) and Okotori (2019) highlight, external factors play a significant role in driving inflation in Nigeria, and their exclusion from the analysis may limit the study's explanatory power. A more sophisticated model, such as Vector Autoregression (VAR) or Generalized Method of Moments (GMM), could better capture the dynamic interplay between domestic and external factors influencing inflation.

While this study presents a comprehensive statistical analysis of inflation dynamics, the inferential statistics may not fully account for all sources of potential endogeneity. Endogeneity arises when an independent variable is correlated with the error term, which could lead to biased estimates of the parameters (Wooldridge, 2013). In the case of Nigeria, policy changes, such as adjustments to interest rates or fiscal reforms, could be endogenous to inflation dynamics, leading to potential bias in the estimates. Future studies could address this limitation by employing instrumental variable (IV) techniques or Generalized Method of Moments (GMM) to mitigate endogeneity concerns.

Furthermore, while the study used Ljung-Box Q statistic to test for autocorrelation, it does not account for the possibility of non-linear relationships in inflation dynamics. As Engle & Granger (1987) note, inflation can exhibit non-linear patterns, particularly in response to large economic shocks or policy shifts. Exploring non-linear models, such as Threshold Autoregressive (TAR) or Markov Switching Models, could provide more accurate insights into the complex dynamics of inflation in Nigeria.

CONCLUSION

This study has examined the paradox of persistent high inflation rates in Nigeria, despite the adoption of prudent inflation-targeting monetary policies. By employing an ARMA model and analyzing time-series data from 1960 to 2023, the study offers valuable insights into the dynamics of inflation in the context of Nigeria's economic and monetary policies. The findings underscore the complexities surrounding inflation persistence, highlighting the role of both domestic and external factors that influence inflation, often beyond the scope of conventional monetary policy frameworks.

One of the central conclusions of the study is that inflation persistence remains a significant challenge for Nigeria, with inflation rates continuing to exhibit high volatility and long-term upward trends. Despite the Central Bank of Nigeria's (CBN) efforts to control inflation through targeted monetary policy measures, including interest rate adjustments and inflation-targeting frameworks, inflation rates have remained persistently high. This aligns with the findings of Ekong & Effiong (2020), who suggests that inflation persistence is often influenced by structural economic factors, such as the reliance on oil revenues, fiscal deficits, and supply-side constraints, all of which limit the efficacy of monetary policy alone.

Moreover, the study reveals that while autoregressive components (AR) of inflation show a high level of persistence, the moving average (MA) component exhibits negative coefficients, pointing to the lagged effects of inflationary shocks. This suggests that while monetary policy may be effective in reducing inflation in the short run, its long-term impact remains limited due to persistent structural issues. Similar conclusions have been drawn by Okotori (2019), who highlights the challenge of managing inflation through monetary policy alone in an environment marked by supply-side constraints and external shocks.

The study also contributes to the broader debate on the limitations of inflation-targeting frameworks, particularly in countries with fragile economic structures like Nigeria. While inflation-targeting remains a cornerstone of monetary policy in many advanced and emerging economies, its effectiveness in developing nations is often constrained by factors such as global oil price fluctuations, exchange rate volatility, and fiscal policy misalignments (Beck et al., 2009). The findings from this study echo those of Kamin (1997), who argue that inflation-targeting can be ineffective in the face of persistent external shocks that overwhelm domestic monetary policy efforts.

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In terms of policy implications, the study emphasizes the need for a comprehensive policy approach that combines effective monetary control with targeted structural reforms aimed at reducing supply-side bottlenecks, improving agricultural productivity, and diversifying Nigeria's economy away from oil dependence. Moreover, given the lagged impact of monetary policy in the Nigerian context, the study advocates for a long-term approach to inflation management that includes better coordination between fiscal and monetary policies.

The findings also underscore the importance of enhancing macroeconomic stability and institutional credibility in order to make inflation-targeting frameworks more effective. As Blanchard (2021) notes, effective inflation control requires a deep understanding of the domestic economy's structural weaknesses and an integrated policy response that takes into account both external shocks and internal economic conditions.

In conclusion, this study highlights that the paradox of persistent high inflation in Nigeria is not merely a result of ineffective monetary policies but rather a reflection of deeper structural challenges within the economy. To overcome this paradox, policymakers must move beyond traditional inflation-targeting mechanisms and adopt a more comprehensive and multidimensional approach to inflation control, one that addresses the root causes of inflation and fosters long-term economic stability.

RECOMMENDATIONS

This study provides key insights into the persistent high inflation rates in Nigeria despite the adoption of prudent monetary policies. The findings highlight that traditional inflation-targeting strategies, while effective in certain contexts, face significant challenges in the Nigerian economic environment due to structural constraints and external shocks. Based on these findings, the following recommendations are made in terms of policy, programmes, and future research.

One of the most critical findings of this study is the significant role of external shocks, particularly fluctuations in oil prices, in driving inflation in Nigeria. Therefore, it is recommended that Nigeria implement policies aimed at economic diversification away from oil dependency. Policies should encourage growth in non-oil sectors such as agriculture, manufacturing, and services. As Beck et al. (2009) argue, economies that are heavily reliant on a single commodity are more vulnerable to inflationary pressures, and diversification is a key strategy for long-term economic stability.

The study reveals that Nigeria's inflation-targeting efforts may be undermined by a lack of coordination between fiscal and monetary policies. The Central Bank of Nigeria (CBN) should collaborate more closely with the Ministry of Finance to ensure that fiscal policies (e.g., government spending and borrowing) complement monetary policies (interest rates and inflation-targeting). This would help mitigate inflationary pressures arising from government fiscal imbalances, as highlighted by Ekong & Effiong (2020), who stresses the need for an integrated approach to inflation control.

Given the significant role of supply-side constraints in driving inflation in Nigeria, it is recommended that the government focus on structural reforms that improve productivity and efficiency in critical sectors such as agriculture, infrastructure, and energy. As Okotori (2019) suggests, improving agricultural productivity could help mitigate food price inflation, a major contributor to overall inflation in Nigeria. Additionally, investments in energy infrastructure could reduce production costs, alleviating inflationary pressures caused by high energy prices.

The Central Bank of Nigeria should focus on enhancing its institutional credibility and independence. As inflation-targeting frameworks often depend on the credibility of the central bank, strengthening the independence of the CBN from political interference will improve the effectiveness of inflation control measures (Blanchard, 2021). This could involve further institutional reforms that ensure the CBN can implement its policies without undue external pressures.

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Given the continued persistence of high inflation rates, it is recommended that the Nigerian government introduce comprehensive inflation management programs that focus on both short-term and long-term measures. Short-term programs could include price stabilization measures to address immediate inflationary shocks, while long-term programs should focus on increasing domestic production capacity and reducing dependency on imports. Programs aimed at improving financial literacy and consumer protection could also be implemented to cushion the negative impacts of inflation on households.

Given the adverse effects of persistent inflation on vulnerable populations, targeted social support programs should be expanded to provide relief for low-income households that are disproportionately affected by rising prices. This could include direct cash transfers, food assistance programs, and other forms of social safety nets. Kamin (1997) emphasize that mitigating the social costs of inflation is an essential component of any comprehensive inflation control strategy.

The Central Bank of Nigeria should increase the transparency of its monetary policy framework. Clear communication of policy objectives, inflation targets, and the rationale behind key policy decisions would help improve public trust in the CBN's efforts to control inflation. This could include regular reports and updates on the progress of inflation-targeting, as well as the introduction of forward guidance to shape market expectations more effectively.

Future research could further investigate the impact of external shocks (such as global oil price fluctuations and exchange rate volatility) on inflation in Nigeria. Understanding the transmission mechanisms of these external shocks will provide valuable insights into how monetary policy can be better designed to respond to global economic conditions. This can be done using vector autoregressive (VAR) models to capture the interrelationship between inflation and external shocks, as suggested by Beck et al. (2009).

More research is needed on the relationship between supply-side structural reforms and inflation control in Nigeria. Specifically, studies that explore how infrastructure development, energy efficiency, and agricultural productivity can reduce inflationary pressures in the long term would be beneficial. Future research should also assess the potential for monetary policy to address inflation within a broader context of structural economic transformation (Okotori, 2019).

Further empirical studies that evaluate the long-term effectiveness of inflation-targeting in emerging economies like Nigeria are needed. These studies could focus on how the institutional and structural factors identified in this study affect the success of inflation-targeting policies over time. Such studies could involve cross-country comparisons to identify best practices in inflation management in similar economic contexts.

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APPENDICES

Appendix 1: Descriptive statistics

	Inflation, Consumer Prices (Annual %)
Mean	15.98985
Median	12.15967
Maximum	72.8355
Minimum	-3.726337
Std. Dev.	14.95101
Skewness	1.98422
Kurtosis	6.827788
Jarque-Bera	81.06791
Probability	0
Sum	1023.351
Sum Sq. Dev.	14082.55
Observations	64

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Appendix 2: Unit root test, INFLATION (in Level)

Null Hypothesis: INFLATION has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=10)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.196805	0.0014
Test critical values:	1% level	-3.540198	
	5% level	-2.909206	
	10% level	-2.592215	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INFLATION)
Method: Least Squares
Date: 03/30/25 Time: 13:14
Sample (adjusted): 1962 2023
Included observations: 62 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFLATION(-1)	-0.451377	0.107553	-4.196805	0.0001
D(INFLATION(-1))	0.239489	0.126187	1.897897	0.0626
C	7.475802	2.249663	3.323077	0.0015

R-squared	0.230095	Mean dependent var	0.296458
Adjusted R-squared	0.203997	S.D. dependent var	12.88385
S.E. of regression	11.49485	Akaike info criterion	7.768852
Sum squared resid	7795.759	Schwarz criterion	7.871778
Log likelihood	-237.8344	Hannan-Quinn criter.	7.809263
F-statistic	8.816437	Durbin-Watson stat	1.887794
Prob(F-statistic)	0.000447		

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Appendix 3: Results of the ARMA(1,2) model

Dependent Variable: INFLATION
Method: ARMA Conditional Least Squares (Gauss-Newton / Marquardt steps)
Date: 03/30/25 Time: 13:20
Sample (adjusted): 1961 2023
Included observations: 63 after adjustments
Failure to improve likelihood (non-zero gradients) after 8 iterations
Coefficient covariance computed using outer product of gradients
MA Backcast: 1959 1960

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.66421	4.360078	4.051353	0.0001
AR(1)	0.817480	0.087426	9.350543	0.0000
MA(2)	-0.448447	0.138756	-3.231916	0.0020

R-squared	0.480681	Mean dependent var	16.15724
Adjusted R-squared	0.463371	S.D. dependent var	15.01052
S.E. of regression	10.99596	Akaike info criterion	7.679380
Sum squared resid	7254.662	Schwarz criterion	7.781434
Log likelihood	-238.9005	Hannan-Quinn criter.	7.719518
F-statistic	27.76802	Durbin-Watson stat	1.949700
Prob(F-statistic)	0.000000		

Inverted AR Roots	.82	
Inverted MA Roots	.67	-.67

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Appendix 4: Ljung-Box Q statistic/ test

Date: 03/30/25 Time: 13:28
Sample: 1960 2023
Included observations: 63
Q-statistic probabilities adjusted for 2 ARMA terms

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.022	0.022	0.0311	
		2	-0.005	-0.005	0.0326	
		3	-0.087	-0.087	0.5505	0.458
		4	-0.013	-0.009	0.5621	0.755
		5	0.013	0.013	0.5738	0.902
		6	0.142	0.135	2.0296	0.730
		7	0.031	0.024	2.0983	0.835
		8	-0.097	-0.099	2.8046	0.833
		9	-0.120	-0.098	3.8968	0.792
		10	-0.001	0.010	3.8969	0.866
		11	-0.116	-0.136	4.9524	0.838
		12	0.022	-0.013	4.9906	0.892
		13	0.013	0.007	5.0038	0.931
		14	0.020	0.032	5.0379	0.957
		15	-0.072	-0.043	5.4828	0.963
		16	-0.116	-0.124	6.6638	0.947
		17	0.137	0.168	8.3375	0.910
		18	0.024	0.009	8.3890	0.936
		19	-0.033	-0.093	8.4901	0.955
		20	0.049	0.045	8.7233	0.966
		21	-0.196	-0.188	12.462	0.865
		22	0.016	0.046	12.489	0.898
		23	-0.072	-0.125	13.024	0.908
		24	0.012	-0.063	13.040	0.932
		25	-0.159	-0.138	15.779	0.865
		26	-0.067	-0.083	16.271	0.878
		27	-0.046	-0.048	16.508	0.899
		28	-0.008	-0.002	16.516	0.923

Appendix 5: ARMA(1,2) structure

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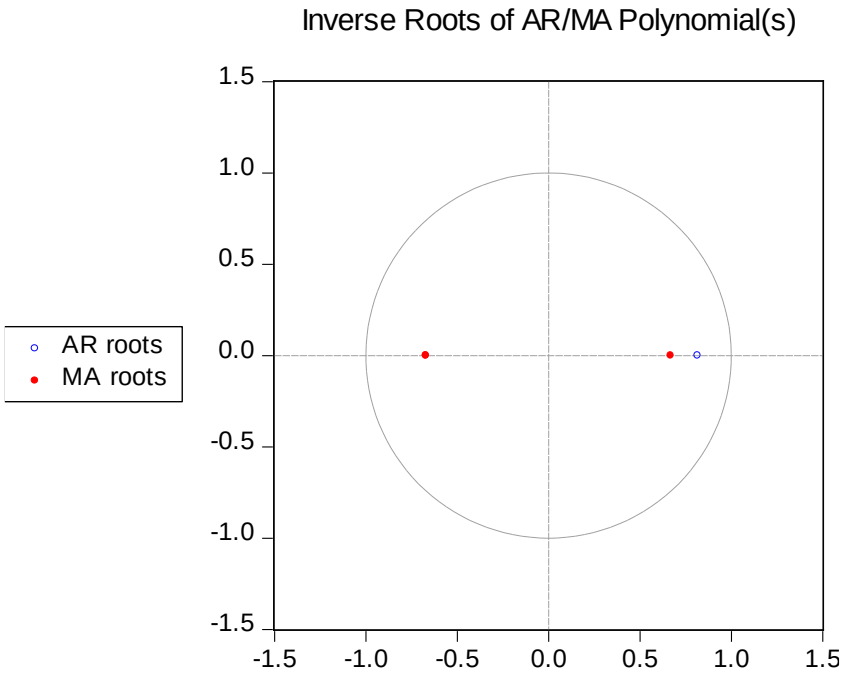
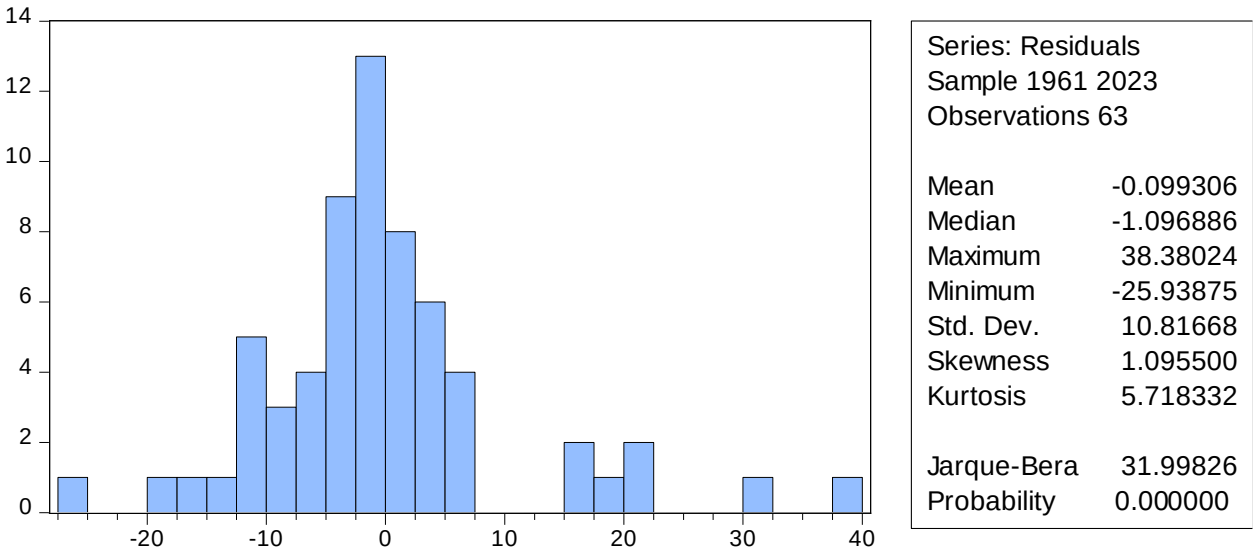


Appendix 6: Histogram of residuals



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Appendix 7: Nigeria's INFLATION and INFLATION FORECAST results

Year	INFLATION	INFLATION_FORECAST
1960	5.444327	5.444327
1961	6.279147	6.279147
1962	5.265632	5.265632
1963	-2.694655	-2.694655
1964	0.856793	0.856793
1965	4.103459	4.103459
1966	9.690346	9.690346
1967	-3.726337	-3.726337
1968	-0.476059	-0.476059
1969	10.15598	10.15598
1970	13.75708	13.75708
1971	15.99911	15.99911
1972	3.45765	3.45765
1973	5.402664	5.402664
1974	12.67439	12.67439
1975	33.96419	33.96419
1976	24.3	24.3
1977	15.08783	15.08783
1978	21.70925	21.70925
1979	11.70973	11.70973
1980	9.972262	9.972262
1981	20.81282	20.81282
1982	7.697747	7.697747
1983	23.21233	23.21233
1984	17.82053	17.82053
1985	7.435345	7.435345
1986	5.717151	5.717151
1987	11.29032	11.29032
1988	54.51122	54.51122
1989	50.46669	50.46669
1990	7.3644	7.3644
1991	13.00697	13.00697
1992	44.58884	44.58884
1993	57.16525	57.16525

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1994	57.03171	57.03171
1995	72.8355	72.8355
1996	29.26829	29.26829
1997	8.529874	8.529874
1998	9.996378	9.996378
1999	6.618373	6.618373
2000	6.933292	6.933292
2001	18.87365	18.87365
2002	12.87658	12.87658
2003	14.03178	14.03178
2004	14.99803	14.99803
2005	17.86349	17.86349
2006	8.225222	8.225222
2007	5.388008	5.388008
2008	11.58108	11.58108
2009	12.53783	12.53783
2010	13.74005	13.74005
2011	10.82614	10.82614
2012	12.22424	12.22424
2013	8.495518	8.495518
2014	8.047411	8.047411
2015	9.009435	9.009435
2016	15.69681	15.69681
2017	16.50227	16.50227
2018	12.09511	12.09511
2019	11.39642	11.39642
2020	13.24602	13.24602
2021	16.95285	16.95285
2022	18.84719	18.84719
2023	24.65955	24.65955
2024	NA	22.69767
2025	NA	18.69728
2026	NA	18.50872
2027	NA	18.35458
2028	NA	18.22858
2029	NA	18.12557

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2030	NA	18.04136
2031	NA	17.97253
2032	NA	17.91625
2033	NA	17.87025
2034	NA	17.83264
2035	NA	17.8019
2036	NA	17.77677
2037	NA	17.75623
2038	NA	17.73943
2039	NA	17.7257
2040	NA	17.71448
2041	NA	17.7053
2042	NA	17.6978
2043	NA	17.69167
2044	NA	17.68666
2045	NA	17.68256

Appendix 8: Graph showing Nigeria's INFLATION and INFLATION FORECAST results