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Analysis of The Effect of Persistent Rate Hikes on Price Stability in Nigeria from 1990-2023: An Ardl Approach

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ABSTRACT

The study evaluates the consequence of persistent hikes in interest rate on price stability in Nigeria. It uses data on major economic parameters such as inflation, real effective exchange rate, GDP growth rate, real interest rate, currency in circulation, lending rate from 1990 to 2023. Inflation is the endogenous variable. Independent indicators are the growth rate of GDP, real interest rate, real effective exchange rate, currency in circulation, and lending rate. The parameters are stationary at levels and first difference which warranted the use of Autoregressive Distributed Lag model (ARDL) bounds test, and Error Correction Model to evaluate the variables. In the short and long run. VAR lag order selection criteria were used to determine the lag length for each variable. Findings show that the growth rate of GDP and real interest rate have a negative effect on inflation in the long run. Further, lending rate, and real interest rate, currency in circulation, real effective exchange rate, have positive impact on inflation in the long run. In terms of granger causality, the research also shows the existence of bi-directional movement from lending rate to inflation and vice versa. There is also the existence of unidirectional movement from inflation to lending rate, real effective exchange rate, and real interest rate. There is also a unidirectional movement from currency in circulation to lending rate. The findings of the study will help the financial and fiscal authorities in Nigeria to know the implications of persistent interest rate hikes on price stability.

INTRODUCTION

Nigeria has pursued policies aimed at ensuring price stability through inflation targeting in the last decade. These policies, not directed at moderating inflation, also aimed at ensuring financial system stability and easing exchange rate pressures. The focus on price stability was to give policy makers, investors and firms the environment where planning would be done with some degree of certainty, make favourable and sustainable investment decisions (Okpo *et al.*, 2023). Price stability is essential because the general average price level remains relatively stable at that time, favouring good planning in government, industry and households. Post Covid 19, inflation in Nigeria has maintained an upward trend, a development that warranted immediate hawkish responses from the Central Bank of Nigeria (CBN). As of December 2024, the Consumer Price Index (CPI), proxied by the headline inflation rate in Nigeria, increased to 34.80 percent, making it the 38th month of consistent increase since November 2021 when it was 15.40 percent. Also in December 2024, the annual All-Items less Farm Produce and Energy inflation rate was 29.28 percent but the Food inflation rate was 39.84 percent, showing the extent of inflationary pressures on food and non-food expenditures.

The rising inflationary pressures also manifested in a number of African countries. Across the Sub-Saharan African countries, inflation rates were mixed. The World Bank data showed that inflation increased to 9.46 percent

in 2022 from 4.03 percent in 2010 within the Sub-Saharan African sub region. Inflation rate in South Africa rose from 4.09 percent to 7.04 percent in the same period. Inflation rate in Ghana increased from 10.73 percent in 2010 to 31.26 percent in 2022. In Cote d' Ivoire, the upward inflationary trend was from 1.23 percent in 2010 to 5.28 percent in 2022. The National Bureau of Statistics' (NBS') data indicated that inflation increased from 14.4 percent in 2010 to 21.32 percent in 2022. The World Bank data showed that inflation increased from 3.96 percent in 2010 to 7.66 percent in 2022 in Kenya. Angola was not different as the inflation rate increase was from 14.47 percent in 2010 to 22.75 percent in 2022.

The CBN responded to inflationary pressures through steady increase in the Monetary Policy Rate (MPR), which rose from 18.75 percent as of December 2023 to 27.5 percent in December 2024, with sole aim to ensure price stability in Nigeria.

Graphs 1.0 and 1.2 demonstrate the patterns exhibited by the inflation rates, lending rates and currency in circulation from 1990 to 2023. In Graph 1.0, there was a spike in inflation rates in early 1990s. The monetary authorities in Nigeria maintained a steady lending rate until the mid-1990s when inflationary pressures moderated. Starting from 1997, the lending and inflation rates intercepted and afterwards, Nigeria's central bank maintained the lending rates higher by some percentage points than the inflation rates. Early 2020s, inflationary pressures reappeared by commencing an upward movement, and maintaining a

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Graph of Inflation vs Lending rates(%) in Nigeria

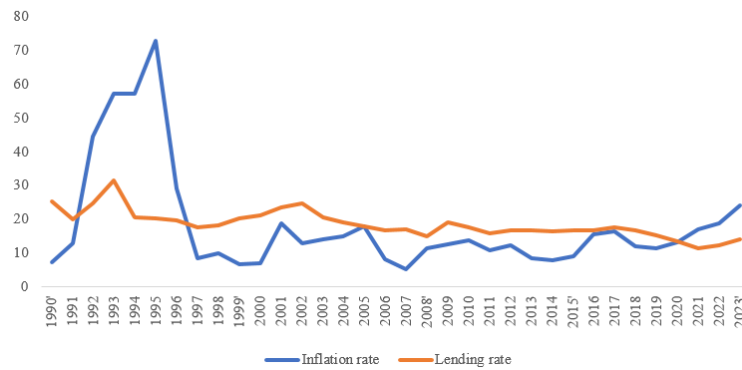


Figure 1: Inflation rate vs Lending rate (%) in Nigeria

Source: CBN

Inflation vs growth rate of CIC

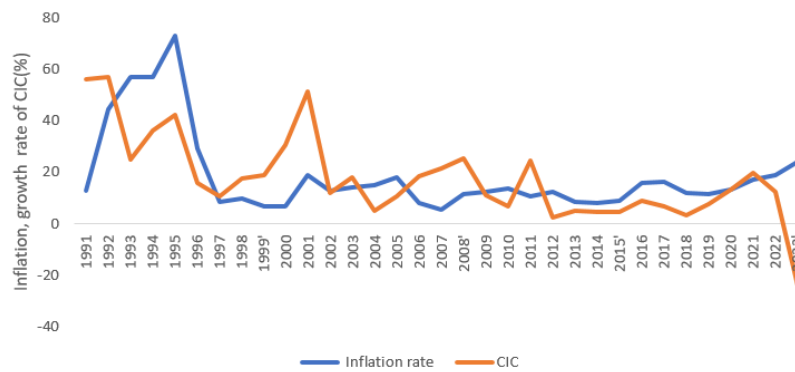


Figure 2: Inflation vs Currency in Circulation (CIC) in Nigeria

Source: CBN

higher trend than the country’s inflation rate. Currency in circulation (CIC) is important in inflation management. Inflation rate in Nigeria rose steadily in the early 1990s until it intercepted CIC and continued to maintain a lower momentum than the CIC for the better part of the study years as shown in Graph 1.2. However, CIC nosedived in 2022 following the implementation of naira swap policy by Nigeria’s central bank. Researchers have argued that Covid 19 transformed the political environment and contributed to the factors that made keeping inflation low not to be possible in the present moment. They argue that central banks will find it difficult to align with democratically elected governments that know that the public dislike high unemployment, lower government spending and inflation. Goodhart and Pradhan (2020) argue that persistent structural changes across the world will make future inflation higher on the average than it was in the past. The authors posit that apex banks in their bid to inflate the economy will focus on the short run targets that include raising output and boosting job creation.

Review of Theoretical Literature

In literature, many economic theories have elaborated on how interest rate is determined. Among these theories are the Classical Theory, Loanable Funds Theory, and the

theory of interest rate estimation by Keynes.

The Classical Theory

Economists Ricardo, Hume, Fisher and others were credited with propounding the classical theory which states that real factors such as the supply of savings, with due diligence for investment play key roles in interest rate determination. They add that to attain equilibrium interest rate, both variables usually work together. The theory further states that the discrepancy between the total national income and total consumption expenditure is the aggregate savings. Forces that affect savings include individuals, households, business and the government. While acting rationally, economic units on their part have the propensity to spend their income on current consumption, and thus support the belief that individuals prefer current consumption to future consumption. In effect, attention is on the real interest rate, and not the nominal interest rate, and what causes changes is the way savings and investors respond to real interest rates. Money is seen as neutral, as the theory postulates that money serves as a means of exchange only, but not as a store of value. Anchored on the existence of perfect competition in the factor market, the rate of interest is believed to be flexible and caused by the market forces. The classical theory states that the income level is given

to be constant with the demand and supply of capital assumed to be independent as they do not influence each other. It is only when income changes as a result of changes in investment that saving also changes.

Consumers, businesses and governments attach more value to money now than at a future date. This rides on the fact that the reward for postponing the current consumption to the future date is known as the rate of interest. Irving Fisher emphasised abstinence as the factor influencing the supply of savings. With respect to the demand side, households and firms demand for capital in order to manufacture goods for profits. The production occurs by sacrificing the present consumption for future consumption. This explains why the saving schedule shows an upward sloping trend while the investment schedule shows a declining sloping pattern, as they both react to the existing interest rates. Thus, the interface between the saving curve, and investment curve that fixes the interest rate that clears the market in the orthodox theory.

The Loanable Funds Theory

The loanable funds model stipulates that monetary and other variables influence investment. This implies that interest rate is fixed when the demand for funds, and supply of funds, are equal. The loanable fund model rests on the assumption that there is a perfect mobility in the market, which is assumed to be perfectly competitive such that every borrower or lender accepts the market price and only an interest rate prevails at the market place, thus making the interest rate the market clearing rate. This theory adds that the demand and supply of loanable funds are given. Further, loanable theory accommodates the effect of hoarding, other sharp practices, and increase in the money supply, thereby relying on monetary and other factors in the determination of interest rate.

The Keynesian Theory of Interest Rate

John Maynard Keynes propounded this theory through “The General Theory of Employment, Interest, and Money”. Keynes opines that interest rate is purely a monetary event and it is fixed by demand for, and supply of money. Under this theory, interest rate is seen as a reward for abandoning liquidity for a specified period. As individuals prefer liquidity to meet the various needs, such as transactionary motive, precautionary motive, and speculative motive, they demand some reward for conceding their liquidity, which is the rate of interest that will be enough to persuade them to part with their current liquidity or money. This explains how the liquidity preference influences interest rate under this theory.

Keynes argues that when the nominal interest rate increases, the demand for money for speculative motives reduces. And when the present interest rate is forecast to be greater than the future interest rate, economic agents will earn more money now by holding more bonds than money in their portfolios. Likewise, if the current interest rate is low and bond prices are high, economic agents

will be unwilling to hold higher bonds, indicating that the amount of money demanded will increase as interest rate declines and vice versa. Furthermore, Keynes says that the liquidity preference and the supply of money will influence the interest rate that clears the market. The money supply is fixed through the central bank.

Monetary Policy and Inflation

Monetary policies are formulated and implemented to moderate inflation and other economic variables that appear not to follow the path designed for them by the monetary authorities. Nigeria has implemented a number of policies aimed at ensuring price stability. The first set of policies implemented to ensure price stability were regarded as the direct control methods. These policies were implemented from 1960 to 1993, and involved the use of quantitative ceilings on credits, administered interest and exchange rates, sectoral allocation of credits and stabilisation securities (Haruna, 2022). The Nigerian economy was further grouped into preferred and less preferred sectors. These categorisations influenced the volume of credits banks facilitated to various segments of the Nigerian economy. The motive was to regulate the volume of credit that was given to certain sectors and the associated cost of capital. The instruments of implementation include administrative fixing of the minimum rediscount rate, cash reserve requirements, liquidity ratios, stabilisation securities, and deposits to and from the central bank.

The second method is the indirect method which came into effect in 1993 and has been in use ever since. This method employed market-based mechanisms to manage the availability of capital and return on financial assets. The indirect method was further divided into two: the pre-banking consolidation era of 1993 to 2005, and after the banking consolidation of 2006 to date. The monetary authorities employed market-based tools such as the open market operation, reserve requirements, treasury bills, treasury certificates, liquidity ratios, movement of government deposits to and from the apex monetary authority.

Interest Rate and Inflation Rate

The inflation and interest rates are the major parameters that investors consider when making investing decisions. This is essential for them to know that particular level of interest rate that a project is viable. The apex bank employs interest rates to control money supply level in the country by raising the level of interest when the currency in circulation and outside banks is very high. At a very high rate of interest, borrowing for investment becomes costly and saving becomes more attractive. The high-interest rate shifts the attention of households and firms from investing to saving. This explains why the CBN reduces the money in circulation by encouraging saving culture among households and firms. By reducing the currency in circulation, the central bank tacitly stabilises the inflation rate within an economy. Musa *et*

al. (2019) employed an ARDL method on money supply, exchange rate, interest rate, per capita GDP and found out that the interest rate exerted positive and substantial effects on inflation in the short and long run. Taderera *et al.* (2021) focused on the Southern African Customs Union (SACU). The scholars found that inflation had an increasing influence on economic activities while lending rate had decreasing influence on economic growth in the long run.

Review of Empirical Literature

The consequence of interest rate hikes on price stability has attracted interest from many scholars. The attention on interest rate and price stability follows the search for optimal inflation rate that promotes economic growth in countries in the global north and south (Taderera *et al.*, 2021). Nigeria is not excluded in the search for optimal inflation rate and that informed the various inflation targeting policies implemented by Nigeria's apex bank. However, different scholars have produced mixed results in Nigeria and elsewhere. This clearly sets the stage for more studies to unravel interest rate and price stability nexus.

Ibrahim *et al.* (2024) critiqued the impact of the pricing of energy products and price stability using an ARDL approach. The authors collected the prices of premium motor spirit (PMS), automotive gas oil (AGO), household kerosene (HHK), compressed natural gas (CNG) and crude oil prices from 1990 to 2022. Their findings showed that prices of PMS and CNG exacerbated inflationary pressures significantly in the short run while the costs of AGO and crude oil moderated inflationary pressures. HHK had a mixed but significant effect on inflation. The authors concluded that PMS prices exert a long run impact on price stability in Nigeria.

Ekpe *et al.* (2024) assessed the consequence of gas monetisation on price stability in Nigeria from 1999 to 2022. As an oil producing country plagued by huge gas flaring, the study aimed to provide more insights on the impact various components of gas monetisation would have on inflation rates. The authors employed the ARDL-ECM model to evaluate the relationship among the components of gas utilisation with inflation. They established that reduction in gas flaring volume will have a significant and inverse relationship with inflation, implying that a decrease in gas flaring will result in long-term price stability.

Okpo *et al.* (2023) assessed the price stability and economic expansion nexus in Nigeria in the presence of national debt. They established that when inflation rate was at a certain range, it boosted price stability and economic certainty, and that played a key role in how firms and individuals arrived at investment and consumption decisions. The study showed that severe inflation or deflation will affect economic decisions and promote uncertainty. The study showed the link between public debt and economic expansion is positively interwoven, and hence price stability is determined by governance and

debt sustainability.

Appah and Tebepah (2023) investigated money market instruments and price stability in Nigeria from 1981 to 2021. The research represented money market tools by treasury bills, treasury certificate, development stock, certificate of deposit, commercial papers, and bankers' acceptance while price stability was represented by CPI. Their study found out that treasury certificates and development stocks have positive and significant effect on CPI. Certificates of deposits and commercial papers have positive both insignificant effect on CPI. They established the presence of short run and long run relationship between money market tools and CPI in Nigeria.

Adeneye (2022) appraised the implication of financial instruments on price stability in Nigeria. The scholar applied ARDL on the time series data from 1999 to 2021. He submitted that interest rate has a positive but statistically insignificant effect on price stability while money supply at different lags has positive, negative and inconsequential effect on price stability. Further, cash reserve ratio has a negative and significant influence on price stability.

The link between short-term financial variables and price stability in Nigeria attracted the attention of Uche *et al.* (2023). With data covering from 1990 to 202, the researchers employed treasury bills, discount window, mutual funds, risk premium lending rate as independent variables while consumer price index and GDP deflator captured the effect of price stability. Inflation and exchange rate were controlled. The authors showed that an inverse and significant long run relationship existed between the consumer price index and money market instruments. The study established a positive and significant long run association between money market tools and GDP deflator. The research work established an inverse and long run link between the explanatory variables and price stability.

Anthony *et al.* (2024) examined the asymmetric impact of exchange rate on the balance of payment in Nigeria with data from 1981 to 2022. The study attracted the attention of the authors because an unstable exchange rate could lead to economic instability in any nation. Variables under study included balance of payment, exchange rate, interest rate, crude oil prices, and trade openness. Applying Nonlinear Autoregressive Distributed Lag (NARDL) model, the authors established a significant and positive effect of interest rate on the balance of payment in Nigeria.

Kenneth *et al.* (2020) evaluated the macroeconomic parameters causing inflation in Nigeria. Employing ARDL model, the study concluded that economic factors such as GDP, money supply, public spending, imports, exchange rate, remuneration, interest rate, PMS price and unemployment rate are significant factors affecting price growth. The authors opined that interest rate should be set at a point that will influence efficient money supply for investment and productive activities.

Haruna (2022) appraised how central bank policy influenced price stability in Nigeria from 2016 to 2021. She submitted that interest rate hike will first affect the lending rate. The effect will transmit to inflation rate and before affecting exchange rate. She opined that in the real sector; the adjustment of aggregate demand does not necessarily adhere to the fluctuations in monetary policy variables.

Ajisafe and Folorunso (2021) were interested in the influence of financial policy on financial stability in Nigeria from 1986 to 2017. Independent variables included interest rate, credit channel, financial stability, and exchange rate channel, were employed and data was extracted from the CBN, NBS, and the World Bank Indicators (WDI). The authors established that when it comes to financial stability, exchange rate mechanism was the visible platform in monetary policy transmission.

Alenoghena (2020) assessed the impacts of oil price fluctuations on productivity growth, exchange rate, inflation, interest rate, and industrial output from 1980 to 2018. In the work, the researcher used the Structural Vector Autoregressive Approach (SVAR) and established that oil shocks negatively and significantly affected economic growth and industrial production. Oil price shocks also produced a positive and significant effect on inflation. The study revealed a positive but insignificant effect of oil price shocks on interest rate and exchange rate stability.

Haruna *et al.* (2022) assessed the influence of financial policy on the average price level in Nigeria. The authors employed ARDL method on data from 1986 to 2020. They established that exchange rate, broad money supply and the Monetary Policy Rate (MPR) have a negative and insignificant effect on price stability. However, the Real Interest Rate (RIR) has a negative and significant effect on price stability. These findings led the authors to conclude that central bank policy does not have a significant influence on the general price stability.

Gaps in the Previous Studies

It is customary for researchers to dissent in their findings. However, their dissents become a source of concern if their studies were carried out on an economy, in this case, Nigeria. Curiosity is aroused if these studies employed similar variables, range of period and scope, but ended up having divergent views on the same topic. This research was necessitated because the synthesis of the reviewed literature above points to the need for more studies to unravel the specific effect of interest rate hikes on price stability in Nigeria. Many of the studies, even when similar monetary variables were employed, pointed to different conclusions. It is even more concerning that the CBN research department is aware of most of these studies and probably not convinced enough, informed the continuous reliance on interest rate hikes to ensure price stability in Nigeria.

Taderera *et al.* (2021) concluded that developed and developing economies are yet to find optimal levels of

interest rates that will ensure price stability. This study aligns with Okpo *et al.* (2023) that inflation within a certain range will enhance price stability and economic certainty. Nigeria is among the biggest energy producers in Africa. Therefore, Ibrahim *et al.* (2024) concluded that while PMS and CNG exacerbated inflation, AGO and crude oil prices moderated it. Similarly, Ekpe *et al.* (2024) submitted that reduction in gas flaring will ensure long term price stability. Adeneye (2022) concluded that interest rate is positively but statistically insignificantly affecting price stability. This study also showed that money supply has both positive and negative insignificant effect on price stability at different lags. Similarly, Haruna *et al.* (2022) submitted that exchange rate, broad money supply and the benchmark interest rate have a negative and insignificant impact on price stability. Variables such as real interest rate have a negative and significant effect on price stability. Uche *et al.* (2023) showed that inflation and short term financial instruments have negative and significant long run relationship. Ajisafe *et al.* (2021) opined that price stability is transmitted through the exchange rate channels. The conflicting findings emphasise that more studies on this subject will not be out of place.

Research Design, Data and Methodology Variables and Data

The study adopts the Quantity Theory of Money as envisioned by Irving Fisher. The Fisher's theory stipulates that in the short run, money supply (M) and the velocity of money (V) are relatively stable. This indicates that any changes in M and V will affect the price level (P) and real output (Q).

$$MV = PQ$$

In the above equation, M stands for money supply, while V captures the speed of money which is the degree at which money moves within a nation. P stands for the general price level, and Q stands for the real output. The Quantity Theory of Money provides a good linkage between money supply, interest rate hike and price stability within an economy. The data employed include inflation rate as indicated by the CPI, GDP growth rate, lending rate, real exchange rate, real interest rate, and the currency in circulation.

The endogenous variable is inflation rate or CPI and is represented in the model as INF. The other variables are independent variables. The growth rate of GDP is captured by GDPGR, lending rate represented by LENDING RATE(LR), real exchange rate as REER, real interest rate as RIR, and currency in circulation as CIC. Most of the data were sourced from the official website of the CBN and the World Bank Group where necessary, ranging from 1990 to 2023.

The model adopts an ex post facto research method, which is ideal in business and social sciences research due to the fact that the events leading to these data have been concluded and no room for data manipulation. The observed effects on price stability or otherwise have already occurred, and therefore, the data is not influenced

by any alteration. This assumption is similar to the assumptions made by Ajisafe and Folorunso (2002), and Haruna (2022).

Adopting a Classical Linear Regression Model (CLRM), the relationship among the variables above is stated in equation 1 below:

$$INF = f(GDPGR, CIC, REER, RIR, LR) \dots (1)$$

The model is further explicitly stated as:

$$INF_t = \theta + \beta_1 GDPGR_t + \beta_2 CIC_t + \beta_3 REER_t + \beta_4 RIR_t + \beta_5 LR_t + U_t \dots (2)$$

INF represents Inflation rate

GDPGR captures GDP growth rate

CIC represents the currency in circulation

REER stands for the real effective exchange rate

RIR stands for the real interest rate

LR represents lending rate

θ is the intercept estimate for inflation or price stability in Nigeria

β_1 to β_5 capture the coefficients of independent variables in equation 2

U_t is the error term

Data Analysis

In determining the impact of interest rate hikes on price stability, the study first adopted a diagnostic test to establish the level of stationarity of the data with the aid of Augmented Dickey-Fuller test. The variables must be stationary at either I (0) and I (1) which is a necessary condition for Autoregressive Distributed Lag (ARDL) analysis. Overlooking this essential stage of the analysis could produce spurious outputs which will compromise the reliability of estimated parameters (Ekpe *et al.*, 2024). Once the data has been found to be stationary, the research proceeded to assess the existence of cointegration among the indicators. The cointegration technique adapted in this research helped to show the presence of short-run and long run dynamics, assisting to preserve the loss of significant information which is

needed in the study ((Ekpe *et al.*, 2024). Therefore, the study utilised the Bounds test from the ARDL models to analyse the model employed in this study. ARDL is flexible as it can conveniently accommodate and analyse variables that are I(0) and I (1).

The ARDL model of estimation is stated in equation 3, thus:

$$INF_t = \theta_0 + \sum_{j=0}^l \theta_1 \Delta INF_{t-j} + \sum_{a=0}^m \theta_2 \Delta GDPGR_{t-a} + \sum_{b=0}^n \theta_3 \Delta CIC_{t-b} + \sum_{c=0}^o \theta_4 \Delta REER_{t-c} + \sum_{d=0}^p \theta_5 \Delta RIR_{t-d} + \sum_{e=0}^q \theta_6 \Delta LR_{t-e} + \theta_7 INF_{t-1} + \theta_8 GDPGR_{t-1} + \theta_9 CIC_{t-1} + \theta_{10} REER_{t-1} + \theta_{11} RIR_{t-1} + \theta_{12} LR_{t-1} + U_t \dots (3)$$

As a follow up to equation 3, there is need to construct the ARDL-ECM (Autoregressive Distributed Lag-Error Correction Model) in a bid to estimate the immediate and gradual effects of interest rate hikes on price stability in Nigeria. At this point, in equation 3 above will be recalibrated to include error correction term (ECT) as follows:

$$INF_t = \theta_0 + \sum_{j=0}^l \theta_1 \Delta INF_{t-j} + \sum_{a=0}^m \theta_2 \Delta GDPGR_{t-a} + \sum_{b=0}^n \theta_3 \Delta CIC_{t-b} + \sum_{c=0}^o \theta_4 \Delta REER_{t-c} + \sum_{d=0}^p \theta_5 \Delta RIR_{t-d} + \sum_{e=0}^q \theta_6 \Delta LR_{t-e} + \theta_7 INF_{t-1} + \theta_8 GDPGR_{t-1} + \theta_9 CIC_{t-1} + \theta_{10} REER_{t-1} + \theta_{11} RIR_{t-1} + \theta_{12} LR_{t-1} + \delta ECT_{t-1} + \varepsilon_t \dots (4)$$

The above equations (3 and 4) encompass unit root tests, cointegration analysis and the ARDL-ECM estimation for the proper understanding of the dynamic nature of the consequence of interest rate hikes on price growth in Nigeria. A unique benefit that the estimations stated in the study presents is that their outputs will confirm if long term equilibrium dynamics and short run fluctuations are adequately addressed in the sturdy.

RESULTS AND DISCUSSION

Descriptive Statistics

The segment relates to the characteristic nature of the research data. This relates to information on the features of the data. The characteristics are the mean, standard

Table 1: Descriptive Statistics

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum	Jarque-Bera	Prob.	Skewness
INF	34	18.2662	15.8972	5.3900	72.8400	48.2826	0.0000	2.1845
GDPGR	34	4.2471	3.9146	-2.0000	15.3300	1.8188	0.4028	0.5135
CIC	34	1002161	930997	16213	3239831	3.3943	0.1832	0.7186
LR	34	18.6043	4.0188	11.4831	31.6500	10.6174	0.0049	1.0337
REER	34	109.5047	48.0885	49.7800	273.0100	36.2552	0.0000	1.8330
RIR	34	3.0168	9.9901	-31.4500	18.1800	20.7571	0.0000	-1.3710

deviation, skewness, kurtosis among others. This is presented in the table 1 below:

Based on the descriptive table above, inflation rate (INF) in Nigeria within the observed period averaged 18.27%, indicating the degree of increase in the average price level. With a standard deviation of 15.90, inflation rates were characterised by high fluctuations. Inflation also has

a positive skewness, indicating a longer tail on the right, which means that there were periods when the rates of inflation were higher than the national mean inflation rate. Currency in Circulation (CIC) displays the highest mean and standard deviation. This is expected because the variable is measured in trillions of naira. The average CIC was N10.02 trillion. Another point to note on Table 1 is

that all the variables have positive skewness which means they have a longer tail at the right side of the graph. This implies these variables were higher than their individual average means during the period covered by the analysis. The RIR which has a negative skewness 1.3710. This means that it has a longer tail at the left side of the skewness graph, indicating that during the period under

study, its figures were below the mean real interest rate.

Unit Root Test

Table 2 shows the point at which the variables are stationary, a necessary requirement for the conduct of cointegration and ARDL models estimation:

The growth rate of GDP (GDPGR), RIR, and REER

Table 2: Unit Root Test

Augmented Dickey-Fuller test statistic				
Parameters	Level with no intercept	Level with intercept	1st Difference	Status
INF	-1.192831(0.2083)	-2.180137(0.2169)	-4.721594(0.0000) *	I (1)
GDPGR	-2.642561 (0.0099) *			I (0)
CIC	2.345770(0.9942)	1.659483(0.9993)	-3.602466(0.0008) *	I (1)
LR	-1.126527(0.2309)	-2.506886(0.1230)	-7.153263(0.0000) *	I (1)
REER	-0.814401(0.3555)	-2.655193(0.0926) ***		I (0)
RIR	-2.002343(0.0449) **			I (0)

GDPGR, REER and RIR are stationary at levels. Other variables are I (1). Probability values at each level of stationarity are in parenthesis. *, ** and *** indicate that the variables are significant at 1%, 5% and 10%. Estimation was carried out with EVIEWS 13.

have ADF test statistic of -2.641389, -2.002343, and -2.6552 that are lesser than their critical values at 1%, 5%, and 10% levels of significance, with associating p-values of 0.0099, 0.0449, and 0.0926 in that order. This shows the parameters are stationary at level or that they require no differencing before attaining stationarity. The remaining three variables which are CIC, Lending Rate (LR) and Inflation (INF) are stationary after first differencing.

Cointegration Test Results

Cointegration is required in this analysis to establish that a set of non-stationary variables move together

over time, exhibiting a long-term association even in the face of short-term fluctuations. A stand out benefit of this method is its ability to address spurious correlation among the non-stationary data towards ensuring that the identified association among the variables under study is not because of random walk features of the data.

Bounds Test- Cointegration Results

Based on the Bounds Test results presented above, the F-statistic indicates if there is an existence of cointegration or otherwise among the indicators. Put differently, the metric shows if the existence of long-term equilibrium

Table 3: Bounds Test- Cointegration Results

F-Bounds Test		Null Hypothesis	No level relationship	
Test statistic	Value	Significance	I (0)	I (1)
F- statistic	9.9788	10%	2.331	3.417
K	5	5%	2.894	4.013

K stands for the number of independent variables

association is present among the parameters under study. The F-statistic derived from the analysis is 9.9788. If the F-statistic falls below the lower bound I (0), it shows there is no cointegration. The lower bound values are 3.900(1%); 2.894 (5%), and 2.331 (10%). The figures indicate the F-statistic is higher than any of the aforementioned lower bound values. The second interpretation is that if the F-statistic falls between the lower and upper bound values, the test is indeterminate. The third interpretation is that if the F-statistic is higher than the upper bound values, this indicates the existence of cointegration. The above outcomes show that the F-statistic of 9.9788 is higher than any of the upper bound values of 5.419(1%),

4.013 (5%), and 3.417 (10%). The appropriate decision here is to reject the null hypothesis and affirm that there is cointegration which shows the existence of a long run association among the parameters under study.

Model Estimation and Discussion of Results
Criteria for selecting Lag length

One of the essential requirements of the ARDL model is the determination of the number of lags to subject each variable to. The outcomes indicate a maximum lag of 3 and are displayed in Table 4 below

The cointegration equation in Table 5 below, COINTEQ*, is an essential component of the ARDL model because it

Table 4: Lag length selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-996.243	NA	4.86e+20	64.661	64.938	64.751
1	-899.496	149.804	1.01e+19	60.742	62.684	61.375
2	-848.583	59.125	5.14e+18	59.780	63.388	60.956
3	-761.184	67.664*	.48e+17*	56.463*	61.737*	58.182*
* Shows lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike Information Criterion						
SC: Schwarz Information Criterion						
HQ: Hannan-Quinn Information Criterion						

Table 5: ARDL-ECM Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-0.1727	0.0707	-2.4415	0.0240
D(CIC)	0.0000	0.0000	-1.2076	0.2413
D(CIC(-1))	0.0000	0.0000	6.8038	0.0000
D(LR)	1.6909	0.2357	7.1737	0.0000
D(REER)	-0.0356	0.0154	-2.3198	0.0310
D(REER(-1))	0.0529	0.0156	3.3806	0.0030
D(REER(-2))	-0.0470	0.0151	-3.1049	0.0056
D(RIR)	-0.6091	0.0752	-8.0968	0.0000
D(RIR(-1))	0.4780	0.1020	4.6872	0.0001
D(RIR(-2))	0.6079	0.0754	8.0618	0.0000
COINTEQ*	-0.3827	0.0353	-10.8442	0.0000
R-squared	0.9464	Mean dependent var		-0.6571
Adjusted R-squared	0.9195	S.D. dependent var		10.3401
S.E. of regression	2.9329	Akaike info criterion		5.2613
Sum squared resid	172.0404	Schwarz criterion		5.7701
Log likelihood	-70.5501	Hannan-Quinn criter.		5.4272
F-statistic	35.2884	Durbin-Watson stat		2.0711
Prob(F-statistic)	0.0000			
Long Run Estimate				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
CIC	0.0000	0.0000	2.4658	0.0201
GDPGR	-0.6675	0.3510	-1.9018	0.0675
LR	2.3637	0.5241	4.5099	0.0001
REER	0.0621	0.0294	2.1122	0.0437
RIR	-1.1820	0.1359	-8.6971	0.0000
C	-31.5672	13.7501	-2.2958	0.0294

Authors' computation using EViews 13 (2025)

indicates the speed that variables converge to long term equilibrium following a brief or short-term volatility. Consequently, the cointegration coefficient is -0.3827 with a t-statistic of -10.8442, with a probability of 0.0000, which all indicates a statistical significance. It is essential that COINTEQ* has a negative value which indicates

that the variables under study display convergent characteristics towards the long-term equilibrium. At -0.3827, it indicates that 38.3% of the disequilibrium in inflation rate or deviation from the long-run path will return to equilibrium within a year. This indicates a not too strong relationship between price stability via

inflation control and interest rate hikes in Nigeria.

The ARDL long run estimates show the variable coefficients and their level of statistical significance, further indicating their long run relationship with monetary instruments so as to bring about price stability. The coefficient of the CIC is positive and significant at 5% level with a p-value of 0.0201 which indicates that a rise in CIC will bring about inflation and the current dataset supports this assertion.

The variable GDPGR and inflation are inversely related in that an increase in one brings about a decrease in the other. A unit rise in the GDP growth rate will bring about a 0.7% decrease in inflation, and this is significant at 10% level with a p-value of 0.0675 in the study. The lending rate (LR) and inflation are positively related. The results of this research show that a unit rise in LR could cause a 2.36% rise in inflation in Nigeria. This is also significant at 1% level with a p-value of 0.0001.

REER and inflation display a positive relationship and significant level at 5% level with a p-value of 0.0437. The results show that if REER increases by 1%, the inflation rate will grow by 0.06%. The Real Interest Rate (RIR) and inflation display a negative relationship and are significant at 1% with a p-value of 0.000, showing that a unit rise in RIR will bring about a 1.18% decrease in inflation.

Discussion of Results

This study has been able to reveal the implications of persistent interest rate hikes on the Nigerian economy. The motive for raising interest rates is to attain price stability which is one of the major policy drives of the CBN. This is to support the fact that the Nigerian economy is being positioned to be a fully market-oriented economy where the private sector will be the engine room of growth. Indisputably, any hawkish stance of the CBN will affect borrowings of government, firms and households. While it is given that an increase in the borrowing cost is one of the implications of interest rate hikes, it is doubtful if the policy will achieve the major focus which is price stability using the results obtained in this research.

The research shows that currency in circulation, lending rate, and the real effective rate of interest have positive and significant effects on price stability in the long run. Put differently, an increase in any of the aforementioned variables will bring about higher inflation in the country. A unit rise in inflation rate will bring about a 2.36% additional rise in the lending rate. Further, if inflation rate increases by a unit, this will cause 0.06% additional hike in REER.

However, the GDP growth rate and real interest rate manifested an inverse and significant impact on the

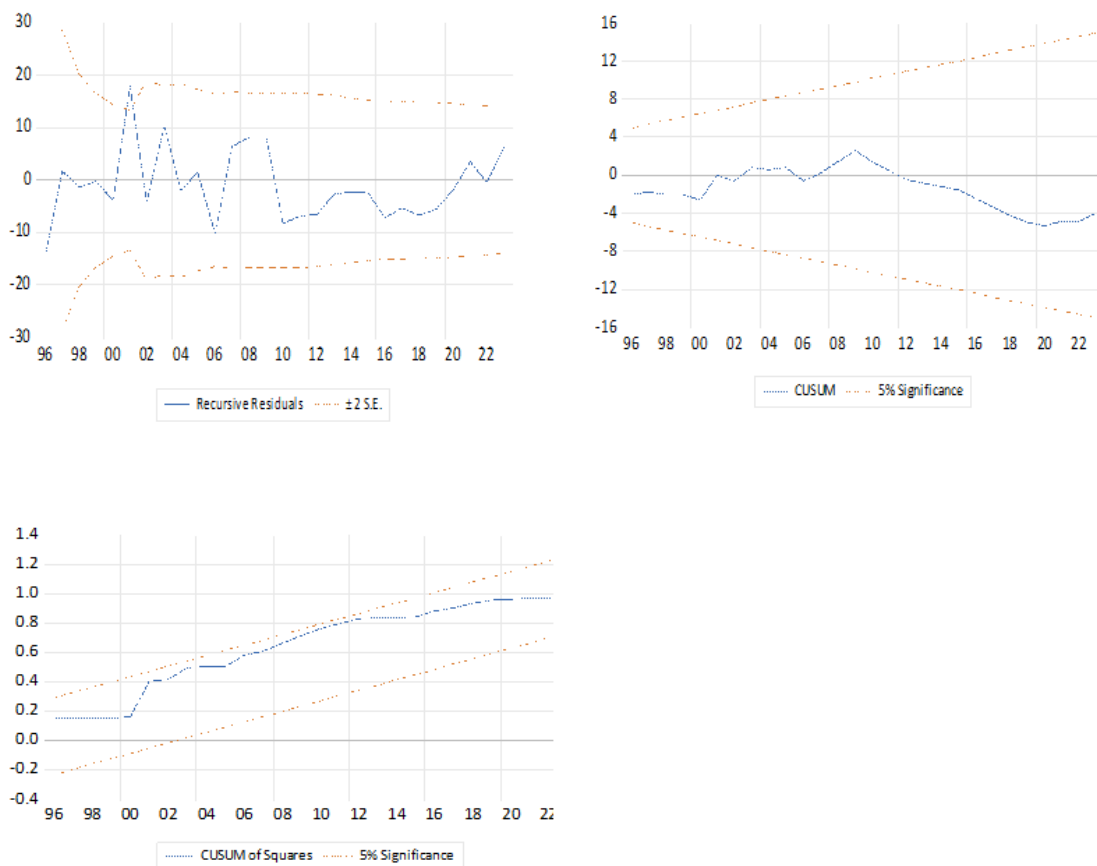


Figure 3:

Table 6: Granger Causality Test

Null Hypothesis	Obs	F-Statistic	Prob.	Decision
LR does not Granger Cause INF	32	6.0673	0.0067	Reject null hypothesis
INF does not Granger Cause LR	32	3.0816	0.0623	Reject null hypothesis
INF does not Granger Cause REER	32	12.1035	0.0002	Reject null hypothesis
INF does not Granger Cause RIR	32	5.8356	0.0078	Reject null hypothesis
CIC does not Granger Cause LR	32	3.1381	0.0595	Reject null hypothesis
GDPGR does not Granger Cause RIR	32	5.6050	0.0092	Reject null hypothesis
LR does not Granger Cause RIR	32	6.0313	0.0068	Reject null hypothesis
RIR does not Granger Cause REER	32	7.6062	0.0024	Reject null hypothesis

inflation rate in the long run. If inflation rate increases by a unit, this will cause the growth rate of the nation's GDP to reduce by 0.7%. This implies that if the policy makers in Nigeria focus on price stability through persistent hikes in the benchmark rate of interest, the rate of growth of Nigeria's GDP will reduce by 0.7%. Also, a rise in the interest rate will manifest a 1.18 percent decline in real interest rate in the long run.

The research outcomes present some contracting features to the findings of Haruna *et al.* (2022). On one hand, their findings showed that the exchange rate (EXR), money supply (M2-proxied by currency in circulation), and the MPR have negative and insignificant impact on price stability. On the other hand, this current study corroborates the findings of Haruna (2022) whose results showed that the RIR had an inverse and significant effect on price stability. The authors submitted that only 1.51% of the disequilibrium in inflation is adjusted within one year.

An important contribution of this study is to identify the lending rate as the variable with the most significant and positive effect on price stability in the long run. Ajisafe and Folorunso (2021) identified the exchange rate link as the dominant transmission mechanism of monetary policy on price stability in Nigeria. This aligns with Obegh and Nwagu (2021) who found out that monetary policy had positive impact on economic growth. However, the findings of this research show that the real effective exchange rate has positive and significant influence on price stability but the impact is not as much as the effect the lending rate has on price stability in Nigeria.

In terms of the direction of movement, this study shows the existence of a bi-directional movement between lending rate and inflation rate in Nigeria at between 1% and 10% significance level. This means the lending rate granger causes inflation while inflation also granger causes the lending rate.

However, there is unidirectional movement from inflation to real effective exchange rate and another unidirectional movement from inflation to real interest rate each at 1% significance level. Further, at 1% level of significance, there is a unidirectional movement from the GDP growth rate to RIR, and from the real interest rate to REER. There is also a unidirectional movement from the lending rate to real interest rate. There is also a unidirectional movement at 5% level of significance from

the currency in circulation to the lending rate.

CONCLUSION

The research was carried out to evaluate the influence of persistent interest rate hikes on price stability in Nigeria, with data covering from 1990 to 2023. The research has established that manipulating interest rates through persistent hikes may not bring about the desired outcome which is price stability. It should be noted that one of the major goals of Nigeria's apex monetary authority, the CBN, is to ensure price stability. This is required for long term planning and economic certainty. This study has established that price stability will be achieved in Nigeria by focusing on the GDP growth rate and RIR.

In terms of granger causality, this research has shown that there is a bidirectional movement from inflation rate to lending rate, and vice versa. However, there is a one-way movement from inflation to REER, and from inflation to RIR. There is also a unidirectional movement from GDP growth rate to RIR and from lending rate to RIR. Further, this study showed that there is also a unidirectional movement from currency in circulation to the lending rate, and from the RIR to the REER.

Utilising the research findings, it will be beneficial to the CBN to focus on policies that will boost GDP growth rate in Nigeria. A clear path to achieve this is through concessionary loans to firms and investors in the real sector particularly the manufacturing and agricultural sectors. It is also necessary to diversify Nigeria's external reserve basket in order to have more of other currencies such as the Chinese Yuan so as to moderate the perennial volatility in the country's foreign exchange market.

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