EFFECT OF MONETARY POLICY ON PRICE STABILIZATION IN NIGERIA 1981 – 2021

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Abstract: This study examined the effect of monetary policy on price stabilization in Nigeria during the period 1981-2021. Data for the study were extracted from the Central Bank of Nigeria (CBN) statistical bulletin and world development index (WDI) 2021. The method of data analysis used is linear regression method with application of Error Correction Model (ECM). The major findings of the study reveal that liquidity ratio has negative and non-significant effect on price stabilization in Nigeria. Cash reserve ratio has a positive but non-significant effect on price stabilization in Nigeria. Monetary policy rate has a positive but non-significant effect on price stabilization in Nigeria. Finally, there exists no causal relationship amongst the variables under investigation. It is therefore the recommendation of the study that to maintain a relatively stable economy, monetary authorities should increase their liquid assets over liabilities so that it will be significant to stabilize price in the Nigerian economy. Secondly, that the Central Bank of Nigeria should modify their regulations to deposit money banks to make sure that they don't keep more than the required cash for creation of money. Thirdly, that the Central Bank of Nigeria needs to reduce monetary policy rate and enforce deposit money banks to charge different interest rates for borrowing purposes. This will relatively make monetary policy rate significant in the Nigerian economy. Finally, the study recommends that government needs to evaluate these monetary policy instruments so that they can be engaged optimally.

Keywords: Monetary Policy, Price Stabilization, Inflation, Consumer Price Index, Nigeria Economy

1.1 Background to the Study

Monetary policy, as a vital tool for macroeconomic management, operates under the purview of monetary authorities with the overarching goal of achieving government economic objectives (CBN, 2011). Historically, these objectives encompass full employment, high output growth, stable prices, and a desirable balance of payments. In the Nigerian context, one of the primary objectives of monetary policy is the attainment of price stability. Despite the various monetary policy regimes implemented by the Central Bank of Nigeria (CBN) over the years, inflation remains a persistent threat to the nation's economic growth.

The roots of Nigeria's inflation challenges can be traced back to the early 1970s when the country experienced high inflation rates. Notably, the inflationary pressures intensified in 1976, partly attributed to a drought in Northern Nigeria that disrupted agricultural production and elevated the costs of food items. Additionally, excessive monetization of oil export reserves may have contributed to the inflationary trends. Subsequent decades saw other factors, such as the effects of wage increases during the Structural Adjustment Programme in the late 1980s, further exacerbating inflationary pressures.

Price stability is widely recognized as a crucial objective in macroeconomic management globally. Economic scholars unanimously emphasize the importance of mitigating frequent price fluctuations, be it persistent increases (inflation) or decreases (deflation). Price instability introduces uncertainties about future prices, heightens business risks, and results in unanticipated changes in wealth distribution (Fielding, 2008). Such uncertainties impede planning for both consumers and producers, undermining the efficiency of free markets in resource allocation and problem-solving.

While moderate and gradual changes in the price level can have positive implications, excessive inflation can discourage savings when prices rise above interest rates. This, in turn, reduces loanable funds for investment, leading to a decline in potential output and employment (Ajayi, 2016). On the other hand, steady price growth, around 3 percent, is believed to stimulate economic growth by motivating investors to allocate resources to the production of goods and services.

In the context of Nigeria, inflation has persisted as a significant economic challenge. Kumapayi (2017) attributes Nigeria's inflation problem to the oil boom of the 1970s and increased government expenditure for post-civil war reconstruction and development. This resulted in a surge in domestic money supply without a corresponding increase in the production of goods and services, adversely affecting investment, output, and employment.

To address the inflation problem, successive Nigerian governments have implemented policy measures, primarily through fiscal and monetary channels. However, undue reliance on fiscal policy has been observed, highlighting the need to restructure the money market to enhance the role of monetary policy instruments in macroeconomic management. The financial sector liberalization (deregulation) under the Structural Adjustment Programme (SAP) of 1986 aimed to achieve this restructuring (Ajisafe, 2012).

Before the deregulation exercise, the financial sector operated under stringent regulations, with ceilings imposed on deposit and lending nominal interest rates. The pre-reform period (1960-1986) was marked by financial repression, characterized by directed credits, interest rate ceilings, and restrictive monetary expansion (Soyibo and Olayiwola, 2016). Financial liberalization sought to develop the money market, laying the foundation for effective monetary policy implementation and control of inflation.

Despite these efforts, price instability continues to be a pressing issue in the Nigerian economic landscape. The Central Bank's annual single-digit inflation rate target remains elusive, raising questions about the efficacy of monetary policy in controlling inflation in Nigeria. This study seeks to investigate the effectiveness of monetary policy on price stabilization in Nigeria, covering the period 1981-2021.

1.2 Statement of the Problem

The Nigerian economy grapples with persistent inflationary pressures that hinder its growth. Gbadebo and Muhammed (2019) note that Nigeria experienced inflationary challenges from the 1970s, with the inflation rate reaching double digits. In the 1990s, inflation increased from 63.6% to 72.8%, indicating a troubling trend. Despite periods of stability in 2003 due to economic reforms, inflationary pressures resurfaced, with rates of 12.9% and 14% in 2000 and 2001, respectively. The headline inflation rate remained in double digits between 2002 and 2005, reaching 15% and 17.9%, respectively.

Although there was a dramatic decrease to 8.24% and 5.38% in 2006 and 2007, inflation surged again to 11.60% and 12.00% in 2015 and 2016. Subsequent years witnessed fluctuations, with a drop to 8.1% in 2019 but a sharp rise to 15.7% in 2020. Price stability, regardless of directional movements, can lead to capital flights or disincentives for potential investors, impacting employment and gross national products (Ezekiel, 2018).

Despite various fiscal, monetary, and macroeconomic policies, Nigeria has struggled to harness its economic potential for rapid development (Ogbole, 2010). Responding to changing macroeconomic conditions, the Central Bank has adopted different monetary policy frameworks over the years. Moving from a short-term to a medium-term framework, the study will assess the impact of monetary policy instruments on price stability in Nigeria, focusing on the period 1981-2021.

1.3   Specific Objectives:
1   To ascertain the impact of liquidity ratio on consumer price index in Nigeria.
2   To determine the impact of cash-reserve ratio on consumer price index in Nigeria.
3   To ascertain the monetary policy rate (MPR) on consumer price index in Nigeria.
4   To find out the causal relationship between monetary policy and consumer price index in Nigeria.

4.4 Research Questions
1. What is the impact of liquidity ratio on consumer price index in Nigeria?
2. How does of cash-reserve ratio impact consumer price index in Nigeria?
3. What is the impact of monetary policy rate (MPR) on consumer price index in Nigeria?
4. What is the causal relationship between monetary policy and consumer price index in Nigeria?

4.5 Hypothesis of the Study
H_{01}: Liquidity ratio does not have a significant impact on consumer price index in Nigeria.
H_{02}: Cash-reserve ratio does not a have significant impact on consumer price index in Nigeria.
H_{03}: Monetary policy rate (MPR) does not have significant impact on consumer price index in Nigeria.
H_{04}: There is no significant causal relationship between monetary policy and consumer price index in Nigeria

Conceptual Literature Review
Monetary Policy: Monetary policy, as defined by the Central Bank of Nigeria (CBN, 2019), is a deliberate action taken by monetary authorities to control the quantity, cost, and availability of money and credit. Sani (2018) further characterizes it as a combination of measures aimed at influencing both the supply of money and credit and the structure of interest rates for the overarching goals of economic growth, price stability, and balance of payments equilibrium. This policy is a crucial tool employed by monetary authorities, such as the CBN and the Ministry of Finance, to navigate macroeconomic challenges.

Monetary Policy Instruments
Reserve Requirement: One of the key instruments employed by the Central Bank is reserve requirements imposed on Deposit Money Banks. This strategy limits the amount of loans banks can extend to the domestic economy, thus controlling the money supply. Open Market Operations involve buying or selling securities, such as Treasury Bills, impacting the supply of reserves to influence the money supply. Lending by the Central Bank, interest rates, direct credit controls, moral suasion, prudential guidelines, and exchange rates are additional instruments, each serving specific purposes in the monetary policy toolkit (CBN, 2020).

Inflation: Inflation, characterized as a persistent and appreciable rise in the general price level (Jhingan, 2002), is a critical consideration in monetary policy. The Consumer Price Index (CPI) is a commonly used measure of inflation in Nigeria, and its persistent increase is viewed as undesirable (CBN, 1991). The study posits that controlling inflation is intricately linked to the effectiveness of monetary policy, emphasizing the need for a well-crafted and executed approach to maintain a tolerable inflation level.

The Concept of Price Stabilization
Definition and Benefits: Price stability is synonymous with a constant price level over time, signifying minimal inflation or deflation. According to the European Central Bank (2020), this stability enhances the transparency of the price mechanism, contributing to increased economic activity and employment. The CBN's monetary policy department (2012) identifies several benefits of price stability, including the promotion of a high standard of living, reduced uncertainty, avoidance of unnecessary hedging activities, increased cash holding benefits, prevention of arbitrary wealth distribution, contribution to financial stability, and alignment with broader economic goals.

2.2 Theoretical Review
Theoretical Framework:
Monetarist Theory of Monetary Policy
The Monetarist Theory, championed by Milton Friedman, stands as a modern variant of classical macroeconomics. This theory places a central focus on the quantity theory of money. Friedman (1963) asserts that the supply of money is a pivotal factor influencing the economy's well-being, emphasizing the necessity for an effective monetary policy to achieve stabilization. According to Monetarism, maintaining a fixed rate of growth in the money supply is crucial for promoting steady economic growth.

In the short-run, Monetarists acknowledge the potential of expansionary monetary policies to boost real GDP by increasing aggregate demand. However, they caution that in the long-run, when the economy operates at full employment, such policies only lead to inflation without impacting real GDP levels. Friedman's argument hinges on the idea that money supply, held in various forms, can influence aggregate money demand and, subsequently, output. The Monetarist perspective underscores the nuanced interplay between money supply, price levels, and real GDP in both short and long-run scenarios.

Keynesian Theory of Monetary Policy
In contrast to Monetarism, the Keynesian Theory rejects the direct and proportional relationship between money and prices. Keynesians, emphasizing the role of interest rates, contend that expansionary monetary policies increase the supply of loanable funds, leading to a reduction in interest rates. The lower interest rates, in turn, stimulate investment and consumption, thereby influencing real GDP positively. Unlike Monetarists, Keynesians reject the assumption of a constant velocity of circulation and posit that monetary policy can indirectly impact real GDP through changes in interest rates.

2.3 Empirical Review
The essence of the empirical literature review is to review past and related studies on the subject under study. Local and foreign studies were reviewed.

Ahmed and Sabo (2020) examined the impact of monetary policy management on inflation in Nigeria during the 1985- 2019. Autoregressive distributed lag analysis was employed on time series data covering the period. It was found that while monetary policy rate and foreign exchange rate impacted negatively on inflation; broad money supply impact positively on it.

Onyeiwu (2020) examined the impact of monetary policy on the Nigeria economy using Ordinary Least Squares (OLS) method. The result showed that monetary policy represented by money supply exert a positive impact on GDP growth and balance of payment but negative impact on rate of inflation and he concluded that CBN monetary policy is effective in regulating the liquidity of the economy which affects some macroeconomic variables such as output, employment and prices.

Adefeso and Mobolaji (2019) investigated monetary policy and economic growth in Nigerian by employing Johansen Maximum Likelihood Cointegration procedure. The result shows that there is a long-run relationship between economic growth, degree of openness, government expenditure and broad money supply (M2).

Owalabi and Adegbite (2014) examined the impact of monetary policy on industrial growth in Nigerian economy using multiple regression analysis. They analyzed the relationship between manufacturing output, treasury bills, deposit and lending, and rediscount rate and industrial growth, and found that the variables have significant effects on the industrial growth.

Chukwu (2019), analyzed the effect of monetary policy innovations in Nigeria. The study used a Structural Vector Auto-Regression (SVAR) approach to trace the effects monetary policy stocks on output and prices in Nigeria. The study also analyzed three alternative policy instruments, that is, broad money (M2), minimum rediscount rate

(MRR), and the real effective exchange rate (REER). The study found evidence that monetary policy innovations have both real and nominal effect on economic parameter depending on the policy variable selected.

Micheal and Ebibai (2019), examined the impact of monetary policy on selected macroeconomic variables such as gross domestic product, inflation and balance of payment in Nigeria using OLS regression analysis. The result shows that the provision of investment friendly environment in Nigeria will increase the growth rate of GDP.

Akujobi (2019), investigated the impact of monetary policy instrument on economic development of Nigeria using multiple regression technique and found that treasury bill, minimum rediscount rate and liquidity rate have significant impact on economic development of Nigeria.

Okwo (2019) examined the effect of monetary policy outcomes on macroeconomic stability in Nigeria. The study analyzed gross domestic product, credit to the private sector, net credit to the government and inflation using OLS technique. None of the variables were significant, which suggested that monetary policy as a policy option may have been inactive in influencing price stability.

Bernhard (2018) examined the channels of monetary transmission mechanism in Nigeria using Granger casualty test to estimate the relationship between the various channels and the selected macroeconomic aggregates. The study shows that three channels of transmission were functional for inflation targeting. They include the interest rate, exchange rate and credit channels.

Omoke and Ugwuanyi (2018) investigated the relationship between inflation and output using Co-integration and Granger Causality test analysis. They found that there was no existence of co- integrating vector in the series used. Thus, the result suggested that monetary stability can contribute towards price stability in Nigerian economy since the change in price level is mainly caused by money supply and thus concluded that inflation in Nigeria is to a large extent a monetary phenomenon.

Okoro (2019) examined the impact monetary policy on Nigeria economic growth by testing the influence of interest rate, inflation, exchange rate, money supply and credit on GDP. Augumented Dickey Fuller (ADF) test, Philips–Perron Unit Test, Co-integration test and Error Correction Model (ECM) techniques were employed. The results show the existence of long–run equilibrium relationship between monetary policy instruments and economic growth.

Umaru and Zubairu, (2019) investigated the impact of monetary policy on economic growth and development in Nigeria between 1970-2018 through the application of Augmented Dickey-Fuller technique in testing the unit root property of the series and Granger causality test of causation between GDP and monetary policy. The results of unit root suggest that all the variables in the model are stationary and the results of Causality suggest that GDP causes monetary policy and not monetary policy causing GDP. The results also revealed that monetary policy possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity. A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of monetary policy in the country.

METHODOLOGY

3.1 Research Design

This study adopted the *Ex post facto* design as the researcher made use of past data in the form of secondary data to investigate the impact of monetary policy on price stabilization in Nigeria.

3.2 Model Specification

T.he model that will guide this study is specified thus:

$$CP1 = \beta_0 + \beta_1 LIQR + \beta_2 CRR + \beta_3 MPR + \mu \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.1)$$

Where;

CPI = Consumer Price Index

LIQR = Liquidity Ratio

CRR = Cash Reserve Ratio

MPR = Monetary Policy Rate

$\beta's =$ The Parameters of the independent variables to be estimated.

μ = Stochastic Error Term

3.4 Method of Evaluation

3.4.1 Economic Criterion Test (a priori Test)

The a priori test of the analysis will be based on the regression coefficient based on the coefficient of the algebraic signs of the parameters. It is a test that will be based on evaluating the conformity of the relationship between the variables on economic theory.

3.4.2 Statistical Test of Significance (First Order Tests)

3.4.2.1 Test for Goodness of Fit

This test involves the test of the goodness of fit. To evaluate the working hypothesis of this study, R^2 the co-efficient of determination is used to test the explanatory power of the variable. R^2 lies between zero and one ($0 \leq R^2 \leq 1$). The closer R^2 is to 1 the greater the proportion of the variation in the dependent variables attributed to the independent variables.

3.4.2.2 t-Test of Significance

To test for the statistical significance of individual regression co-efficient, t-statistic is used. A two-tailed test will be conducted at 5% level of significance. The null hypothesis Ho will be tested against the alternative hypothesis H_1.

Decision Rule (T-Test)

If $t_{0.025} < t^*$ Ho will be rejected and the H_1 accepted. Otherwise, the alternative hypothesis H_1 will be rejected and the null hypothesis Ho be accepted.

3.4.2.3 F-TEST of Significance

To Test the statistical significance of the entire regression, the f-ratio is used. The test will be conducted at 5% level of significance.

Decision Rule (F-Test)

If $f^* > (f_{0.05})$, we say the regression is statistically significance but if otherwise, it implies that it is statistically insignificant

Note: t*   =   computed t – value

t_{0.025}   =   tabulated t – value

f*   =   Computed f-value

f_{0.05}   =   tabulated f – value

3.4.3 Econometrics Test of Significance (Second Order Tests)

Autocorrelation Test

To evaluate the reliability of the expected numerical estimates, the Durbin – Watson (D-W) statistics at 5% will be used to test for the presence of autocorrelation problem. The region of autocorrelation remains:

du < d* < (4-du)

Where:

du = Upper Durbin – Watson

d* = Computed Durbin-Watson

Decision Rule (Autocorrelation Test)

If the computed value of Durbin-Watson lies within the region, it means there is no presence of autocorrelation problem. But if the Durbin-Watson computed value lies outside the regions there is the presence of autocorrelation problem and a remedial measure like the use of first difference equation will be adopted.

3.5   Diagnostic Tests

3.5.1 Normality Test

The normality test will be carried out to ascertain if the residuals of the model are normally distributed. The basis of the decision will be based on the value of the Jaque-Berra [JB].

Decision Rule

If the JB statistics yields a value close to or equal to zero, we accept the null hypothesis of normal distribution, but if otherwise we reject the normal distribution hypothesized value.

3.5.2   Heteroscedasticity Test

The primary essence of this test is to evaluate if the variance of the residuals are constant overtime. It is thus based on ascertaining if the series possess the Homoscedasticity property. The basis of judging the heteroscedastic status of the residuals is based on comparing the values between the Computed Chi-Square [X^2] and the tabulated version.

Decision Rule

If the computed X^2 exceeds the tabulated X^2, we conclude that there is the presence of heteroscedasticity in the residuals but if otherwise, we conclude there is the presence of homoscedasticty in the residual series.

3.5.3   Unit Root/Stationary Test

This is will be used to test whether a variable's mean value and variance varies over time. It is necessary in time series variables in order to avoid the problem of spurious regression. The Augmented Dickey Fuller (ADF) test will be used for the analysis. Augmented Dickey-Fuller (ADF) test is used to test existence of unit root when there is autocorrelation in the series and lagged terms of the dependent variable are included in the equation. The following three models represent pure random walk, random walk with drift and random walk with drift and trend used in Augmented Dickey Fuller tests:

$$\Delta \psi_t = \Omega \psi_{t-1} + \sum_{i=1}^{p} \beta_i \Delta \psi_{t-1} + \varepsilon_t$$

$$\Delta \psi_t = \alpha_0 + \Omega \psi_{t-1} + \sum_{i=1}^{p} \beta_i \Delta \psi_{t-i} + \varepsilon_t$$

$$\Delta \psi_t = \alpha_0 + \Omega \Psi + \beta_2 t + \sum_{i=1}^{p} \beta_i \Delta \psi_{t-1} + \varepsilon_t$$

where: $\Omega = (\lambda - 1)$ The null hypothesis is $H_0 : \Omega = 0$ and the alternative hypothesis is $H_a : \Omega < 0$ If ADF test statistic (t-statistic of lagged dependent variable) is less than the critical value, we reject the null hypothesis and conclude that the series is stationary (there is no unit root).

3.5.4   Co-integration test

In an econometric analysis, there is the need to estimate the long-run relationship of the variables under consideration. This will be applied on the concept of Cointegration test. One of the most popular tests for cointegration has been suggested by Engel and Granger (1987). The process is demonstrated thus; given a multiple regression: $y_t = \beta' x_t + \mu_t, t = 1,...,T$, where $x_t = (x_{1t}, x_{2t},..., x_{kt})'$ is the k-dimensional I(1) regressors. For y_t and x_t to be cointegrated, μ_t must be I(0). Otherwise it is spurious. Thus, a basic idea is to test whether μ_t is I(0) or I(1).

3.5.5   Error Correction Model (ECM)

The error correction analysis is an econometric analysis carried out if the variables under investigation are seen to be cointegrated. The Error Correction Mechanism (ECM) will be used to estimate the speed of adjustment of the short-run dynamics of the variables and timing to long run convergence. The ECM is given by the equation:

Where Δ = First Difference Operator

3.5.6   Granger Causality Analysis

The Granger causality model is a statistical technique that was carried out to the direction of causality existing between the dependent variables and the specified independent variables.

Decision Rule

If the probability value of an estimated Granger causality is less than 0.05, we reject the null hypothesis and conclude that a Granger causality exists while if the probability value is greater than 0.05, we accept the null hypothesis and conclude that there exists no causality relationship among the variables.

3.6   Data Sources

The data required in this research are time series data on liquidity ratio, cash-reserve ratio, monetary policy rate, consumer price index and exchange rate covering the period 1981-2021. They will be sourced from the central bank of Nigeria Statistical Bulletin, 2021 edition and World Development Index (WDI) 2021.

3.7   Statistical Software

The software used in this research is the E-views version 10. The primary purpose of using this software is because it is user friendly.

4.1.1   Unit-Root Test Result

Table 4.1: *Unit Root Test Result*

VARIABLE	ADF STAT.	CRITICAL VAL.	ORDER
CPI	-5.752686	-2.941145	I(1)
LIQR	-7.563743	-2.941145	I(1)
CRR	-5.015690	-2.948404	I(1)
MPR	-6.919531	-2.943427	I(1)
EXR	-4.883468	-2.941145	I(1)

Source: *Author's Computation Using E-views 10.*

Table 4.1 clearly shows that all the variables are stationary at first difference (I(1)). This means that the variables have unit-root until differenced in the first order.

4.1.2 Cointegration Analysis (Johansen Methodology)

Table 4.2: Cointegration Test Result

Date: 11/09/22 Time: 14:33				
Sample (adjusted): 1983 2020				
Included observations: 38 after adjustments				
Trend assumption: Linear deterministic trend				
Series: CPI LIQR CRR MPR EXR				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.647721	74.02043	69.81889	0.0222
At most 1	0.336669	34.37383	47.85613	0.4815
At most 2	0.237106	18.77557	29.79707	0.5091

At most 3	0.168872	8.491380	15.49471	0.4144
At most 4	0.037754	1.462445	3.841466	0.2265
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: *Author's Computation Using E-views 10.*

The Johansen method of cointegration was used for the study because all the variables are stationary at first difference. The Johansen result as displayed in table 4.2 clearly shows evidence of cointegration as trace statistics test indicates 1 cointegrating equations as the trace statistic value is greater than that of 5% critical value (74.02043 > 69.81889). This entails that there exists a long-run relationship among monetary policy variables and consumer price index.

4.1.3 Regression Results

Table 4.3: ECM Result

Dependent Variable: D(CPI)				
Method: Least Squares				
Date: 11/09/22 Time: 14:38				
Sample (adjusted): 1982 2021				
Included observations: 39 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.283829	2.423665	-0.117107	0.9075
D(LIQR)	-0.118436	0.153919	-0.769472	0.4471
D(CRR)	0.171779	0.189513	0.906428	0.3713
D(MPR)	0.313425	0.515454	0.608056	0.5473
D(EXR)	-0.005823	0.128785	-0.045218	0.9642
ECM(-1)	-0.551338	0.157434	-3.502030	0.0013
R-squared	0.297036	Mean dependent var		-0.194020
Adjusted R-squared	0.190526	S.D. dependent var		14.98068
S.E. of regression	13.47823	Akaike info criterion		8.180667
Sum squared resid	5994.870	Schwarz criterion		8.436600
Log likelihood	-153.5230	Hannan-Quinn criter.		8.272494
F-statistic	2.788816	Durbin-Watson stat		1.574525
Prob(F-statistic)	0.032983			

Source: *Author's Computation Using E-views 10.*

It can be clearly seen from table 4.3 that the numerical coefficient of liquidity ratio (LIQR) a negative numerical coefficient at the magnitude of -0.118436 with a corresponding p-value of 0.4471 > 0,05. This entails that liquidity ratio contributes negatively and insignificantly to consumer price index as a measure of price stabilization. This further entails that a one percent increase liquidity ratio yielded a decrease in CPI by 0.118436. This conforms to economic a priori expectation.

The numerical coefficient of cash reserve ratio (CRR) yielded a positive value at the magnitude of 0.171779 with a corresponding probability value of 0.3713. This means that CRR contributes positive but insignificantly to price stabilization in Nigeria measured with CPI.

The numerical coefficient of monetary policy rate (MPR) yielded 0.313425 with a corresponding p-value of 0.5473. This entails that MPR contributes positively and insignificantly to consumer price index.

Exchange rate being a control variable yielded a negative numerical coefficient at the magnitude of -0.005823. This entails that there exists an adverse relationship between exchange rate and consumer price index for the period under analysis.

The F-statistics which is employed to test for the statistical significance of the entire regression plane yielded 2.788816 with a corresponding probability value of 0.000225< 0.032983. This entails that the test is statistically significant at the entire regression plane.

The coefficient of determination (R^2) which measures the explanatory power of the independent variables yielded 0.297036. This implies that approximately 30% of the variations in consumer price index are explained by changes in monetary policy variables used in the study.

The error correction mechanism (ECM) which measures the speed of the adjustment of the variables at which equilibrium is restored yielded -0.551338. This is correctly signed (negative) at 5 percent level, and therefore confirms our earlier proposition that the variables are co-integrated. The speed suggests that consumer price index in Nigeria adjusts relatively slowly to the long-run equilibrium changes in the explanatory variables and it gives the proportion of the disequilibrium error accumulated in the previous period that is corrected in the current period. The speed of adjustment is specifically at 55.1338% annually.

4.1.4 Serial Correlation LM Test Result

Table 4.4: Serial Correlation Test Result

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.049758	Prob. F(2,31)	0.0126
Obs*R-squared	9.583595	Prob. Chi-Square(2)	0.0083

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/09/22   Time: 15:04
Sample: 1982 2020
Included observations: 39
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.517960	2.185315	0.237019	0.8142
D(LIQR)	-0.038277	0.139562	-0.274262	0.7857
D(CCR)	-0.055028	0.173980	-0.316290	0.7539
D(MPR)	-0.560979	0.531893	-1.054684	0.2997
D(EXR)	-0.038496	0.116518	-0.330384	0.7433
ECM(-1)	-0.028164	0.377033	-0.074698	0.9409
RESID(-1)	0.358352	0.367195	0.975917	0.3367
RESID(-2)	-0.495292	0.254483	-1.946269	0.0607

R-squared	0.245733	Mean dependent var	-7.63E-16
Adjusted R-squared	0.075415	S.D. dependent var	12.56024
S.E. of regression	12.07735	Akaike info criterion	8.001222
Sum squared resid	4521.731	Schwarz criterion	8.342466
Log likelihood	-148.0238	Hannan-Quinn criter.	8.123657
F-statistic	1.442788	Durbin-Watson stat	2.069382

Prob(F-statistic)	0.224221

Source: *Author's Computation Using E-views 10*

The Breusch-Godfrey Serial Correlation LM Test was used to carry out the test of autocorrelation. It is clearly seen that the Obs*R-squared which follows the computed Chi-Square distribution yielded 9.583595 and it is clearly greater than the Chi-Square probability which yielded 0.0083. This compels us to accept the null hypothesis that there is no serial correlation of any order. Hence; there is no presence of autocorrelation problem in the model.

4.1.5 Granger Causality Test Result

Table 4.5: Causality Test Result

Pairwise Granger Causality Tests
Date: 11/09/22   Time: 15:31
Sample: 1981 2020
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LIQR does not Granger Cause CPI	38	0.92361	0.4071
CPI does not Granger Cause LIQR		0.32013	0.7283
CRR does not Granger Cause CPI	38	0.66803	0.5195
CPI does not Granger Cause CRR		0.11787	0.8892
MPR does not Granger Cause CPI	38	0.91318	0.4111
CPI does not Granger Cause MPR		2.80062	0.0753
EXR does not Granger Cause CPI	38	1.42907	0.2540
CPI does not Granger Cause EXR		0.58203	0.5644

Source: *Author's Computation Using E-views 10*

It can be clearly seen from the Granger causality table that none of the probability values yielded a value less than 0.05. This entails that there exists no causality relationship among the variables. Hence, monetary policy does not granger cause CPI and CPI does not granger-cause monetary policy.

It is therefore the recommendation of the study that to maintain a relatively stable economy, monetary authorities should increase their liquid assets over liabilities so that it will be significant to stabilize price in the Nigerian economy. Secondly, that the Central Bank of Nigeria should modify their regulations to deposit money banks to make sure that they don't keep more than the required cash for creation of money. Thirdly, that the Central Bank of Nigeria needs to reduce monetary policy rate and enforce deposit money banks to charge different interest rates for borrowing purposes. This will relatively make monetary policy rate significant in the Nigerian economy. Finally, the study recommends that government needs to evaluate these monetary policy instruments so that they can be engaged optimally.

5.1   Conclusion

The study has been able to carry out an empirical X-Ray of monetary policy and price stabilization in Nigeria. Based on the major findings of the study, it can be concluded that there are many other macroeconomic variables outside the monetary policy system that significantly influences price level in Nigeria. This is because based on the results, none of the monetary policy variables significantly influences price stabilization which is a measure

for price stabilization. Hence, policies directed at stabilizing the price level, should include other dimensions like fiscal policies and sectorial inclusion.

5.2   Recommendation

On the basis of the findings of this study, the following recommendations emerged;

1. To maintain a relatively stable economy, monetary authorities should increase their liquid assets over liabilities so that it will be significant to stabilize price in the Nigerian economy
2. The Central Bank of Nigeria should modify their regulations to deposit money banks to make sure that they don't keep more than the required cash for creation of money.
3. The Central Bank of Nigeria needs to reduce monetary policy rate and enforce deposit money banks to charge different interest rates for borrowing purposes
4. Finally, the study recommends that government needs to evaluate these monetary policy instruments so that they can be engaged optimally.

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