



EFFECT OF GOVERNMENT EXPENDITURE ON INFLATION IN NIGERIA

Fasewa Yemi Olaide and Aderinto Esther Ranmilowo*

Department of Economics, Lead City University, Ibadan, Oyo State, Nigeria.

*E-mail: esthercareer@yahoo.com

Cite this article:

Fasewa Y.O., Aderinto E.R. (2023), Effect of Government Expenditure on Inflation in Nigeria. African Journal of Accounting and Financial Research 6(4), 1-28. DOI: 10.52589/AJAFR-5YXMDYAT

Manuscript History

Received: 29 June 2023

Accepted: 17 Aug 2023

Published: 8 Sept 2023

Copyright © 2023 The Author(s).

This is an Open Access article distributed under the terms of Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0), which permits anyone to share, use, reproduce and redistribute in any medium, provided the original author and source are credited.

ABSTRACT: *This study examined the effect of government expenditure on inflation in Nigeria while disaggregating expenditure into capital and recurrent. The study also examined the response of inflation to changes in government expenditure in Nigeria. Secondary data collected from the Central Bank of Nigeria Statistical Bulletin was employed for a period of thirty-eight years (i.e. 1981-2019). The Auto Regressive Distributed Lag technique was employed. For the first model explaining government capital expenditure, short run estimates reveal that in the current period, government capital expenditure has a significantly negative relationship with inflation. For government recurrent expenditure, it was established that government recurrent expenditure has a positive relationship with inflation. The impulse response test used in analyzing the effect of an unanticipated change in government expenditure (capital and recurrent) on inflation shows that the effects of the change in both cases are temporary as they are seen to revert to the mean. The study recommends that the government should maintain a good strategic balance between capital and recurrent expenditure to prevent the economy from being consumption - based.*

KEYWORDS: Capital expenditure, Exchange rate, Inflation, Recurrent expenditure, Nigeria.



INTRODUCTION

Government expenditure plays an important role in determining the level of national income; providing the right needs for potential output and sustaining the welfare of every economy, given that the main macroeconomic objective of every country is to sustain high economic growth with low inflation (Liu, Hsu & Younis, 2008). In both developed and developing countries, there is a concern for raising living standards overtime, but this need is much more pronounced in developing countries, given the extent and depth of poverty in these countries.

Increasing government expenditure has a long run detrimental effect on inflation because the various modes of financing government expenditure, such as tax revenues, government borrowing (local and external) and borrowing from the central bank could have negative effects. According to the Keynesians school of thought, one of the principal causes of high rates of inflation in developing economies is excessive government spending. Excessive government spending raises aggregate demand over supply, thereby causing prices to rise.

Inflation is inevitable to all economies of the world with its attendant negative influence, both in developed and developing countries. Inflation is an important economic factor which if uncontrolled, might lead to social and economic instability and disorder (Anyanwu, 2016). Inflation imposes negative externalities on the economy as it interferes with the economy's efficiency by reducing international competitiveness, making exports relatively smaller to imports and thus impacting on the balance of payments (Komain & Brahmasrene, 2007).

Over the years, there has been steady increases in government spending without a corresponding increase in economic growth and development for developing countries. Nigeria, being a developing country, suffers from price instability given its double-digits inflation rate. Moreover, Nigerian governments at all levels often incur expenditure on unproductive and growth-enhancing projects, and this stirs inflationary pressure on the economy. The inability of the government to incur expenditure in a prudential manner has contributed to high rate of inflation in Nigeria. Fiscal recklessness has impeded the economy of Nigeria from having a low rate of inflation that fosters economic growth.

In Nigeria for instance, despite the huge expenditures, there is still an insignificant level of development witnessed. Public expenditures on all sectors of Nigeria's economy are expected to lead to economic growth in the sense that the capital and recurrent expenditure will boost the productive base of the economy which in turn will lead to growth. Over the years, government capital expenditure has been unstable. In 1984, the amount spent on capital projects was ₦4.10 billion while it increased to ₦24.05 billion in 1990. During this period, the highest level of inflation was in 1984. From 1991 till date, capital expenditure has been on a constant rise from ₦28.34 billion in 1991, ₦121.14 billion in 1995, ₦552.39 billion in 2006 and ₦1,152.80 billion in 2009 after which it became fairly unstable with rise and fall until 2017 when it was at ₦1242 billion, before reaching ₦2522 billion in 2021 (CBN Statistical Bulletin, 2021).

Similarly, huge chunks of the Nigerian federal government expenditure have been channeled into recurrent expenditure over the years due to some factors such as expansion in the size of the civil service and disproportionate emoluments for political office holders among others. Recurrent expenditure grew from ₦36.21 billion (about \$4.5 bn) in 1990 to about ₦3.109 trillion (about \$20.68 bn) by the year 2010, while increasing to ₦3831 bn in 2015 and surging



consistently to ₦9145 bn in 2021 (CBN Statistical Bulletin, 2021). These periods have also been witnessed with fluctuating rates of inflation. It is against this background that this study examines the relationship between government expenditure and inflation in Nigeria from 1981 to 2021. The study deviates from other studies by particularly examining which expenditure (recurrent or capital) has a higher influence on inflation in Nigeria, as well as determining the response of inflation to shocks in government expenditure.

LITERATURE REVIEW

There exists a plethora of studies on the effect of government expenditure on economic growth for several countries, while a few studies have examined the nexus between government expenditure and inflation. However, there is no consensus in literature on the relationship between government expenditure and inflation. Similarly, the response of inflation to government spending shocks has typically received limited attention in the empirical literature.

Nguyen (2019) examined the short and long run effect of government expenditure on inflation for three Asian countries. The study employed the Vector Error Correction Model using data from 1970 to 2010. Findings revealed that government expenditure negatively influences inflation in China, while a positive relationship was established for India and Indonesia. Rangkuty, Lia and Patmawati (2020) also analyzed the causal and cointegration relationship between government expenditure and inflation in Indonesia. While employing the Granger Causality test, a one-way causality was discovered, showing that government expenditure affects inflation. Following the pervasively high inflation rate in Indonesia, Sriyana (2019) employed the Non-Linear Autoregressive Distributed Lag (NARDL) model to examine asymmetries in the relationship between government expenditure and inflation from 1970-2017. Long run asymmetry was discovered with a positive relationship recorded between government expenditure and inflation.

In a similar study for Sri Lanka and India, Shifaniya et al. (2022) analyzed the effect of government expenditure on inflation by employing the ARDL methodology. Results showed a positive relationship between government expenditure and inflation for both countries in the long run. In a study for Iran, Kia and Jafari (2020) recorded a negative association between government expenditure and inflation in the short run.

In a study for South Africa, Madito and Odhiambo (2018) examined the determinants of inflation using quarterly data from 1970Q1 to 2015Q4. The study employed the Error Correction Model technique and empirical results revealed that inflation expectations, labor costs, government expenditure and import prices positively determine inflation, while GDP and exchange rates are negative determinants of inflation. Sirah (2020) examined the impact of external debt, government expenditure, government budget deficit and tax revenue on inflation rate in Ethiopia using the ARDL model. Short run results showed that budget deficit and government expenditure has positive impact, but tax revenue and external debt has negative impact on inflation rate.

Oyerinde (2019) examined the relationship between government expenditure and inflation in Nigeria using data from 1980 to 2017. Johansen Cointegration analysis and vector error correction model results showed that apart from the bi-directional relationship that exists between the variables, there exists a strong relationship between government expenditure and



inflation rate and that a significant impact is sustained from the short run through the long run. Ebisine and Oki (2021) also examined the effect of public expenditure on inflation in Nigeria from 1981 to 2018. The study adopted descriptive statistics, Co-integration and Error Correction Mechanism techniques for the analysis. Results indicated a long run relationship exists among the variables. In a similar study for Nigeria, Abdullahi et al. (2022) analyzed the effects of government expenditure on inflation, unemployment, consumption and investment using the ARDL technique. The long run results show that both recurrent and capital expenditures have negative effects on inflation but positive effects on investment.

George-Anokwuru and Ekpenyong (2020) analyzed the impact of government spending on inflation in Nigeria between 1999 and 2019. ARDL results revealed a positive but insignificant relationship between government expenditure and inflation rate in the short-run. Moreover, in the long-run, government expenditure has a negative and statistically significant relationship with inflation rate. Akobi et al. (2021) also examined the effect of government expenditure on inflation rate in Nigeria from 1981-2019. Findings indicate that government expenditure on education has a positive and insignificant effect on the inflation rate. It was also discovered that government expenditure on agriculture and government expenditure on education have positive but insignificant effects on the inflation rate, while government expenditure on health and government expenditure on telecommunications have positive and significant effects on inflation rate.

Dada and Abalaba (2018) also examined the causal-relationship between government expenditure growth and inflation in Nigeria during the period 1961-2011. The results showed that there exists a long-run unidirectional causality from inflation to government spending. There is no support for the feedback hypothesis. Dikeogu (2018) examined the effect of public spending on inflation in Nigeria from 1980 to 2017. The Auto Regressive Distributed Lag (ARDL) was used to analyze the relationship between public spending and inflation in Nigeria. The result shows that government capital spending impacts negatively on inflation; government recurrent spending has a negative and an insignificant impact on inflation.

Maku et al. (2022) employed the Bayesian Vector Autoregressive to investigate the impact of government expenditure on macroeconomic variables in Nigeria from 1986 to 2020. Empirical results indicated a positive shock in government recurrent expenditure has no statistically significant effect on inflation rate and interest rate. This shows that government recurrent expenditure does not give rise to inflation rate and interest rate. However, an increase in government capital expenditure has a negative impact on the inflation rate.

Okeke et al. (2022) examined the determinants of inflation in Nigeria using data from 1981 to 2017. The study employed the ARDL methodology and short-run results of both models revealed that government expenditure is a major determinant of inflation in Nigeria. In a similar study, Adeleye et al. (2019) examined the internal and external factors that affect inflation in Nigeria between 1981 and 2017. The study employed the vector error correction mechanism and the impulse response function and results showed that external drivers such as exchange rate, imported inflation and openness directly affect inflation while internal factors like government expenditures, net food exports and lending interest rate reduce inflation significantly.

Iwuoha (2020) employed the Auto Regressive Distributed Lag Model in analyzing the impact of fiscal policy measures on macroeconomic variables for Nigeria. Results showed that



government expenditure increases inflation in Nigeria. Similarly, Nwamuo (2022) analyzed the effect of public expenditure on inflation in Nigeria from 1981 to 2021. Using the ARDL technique, long run results showed that capital expenditure has no impact on inflation rate while recurrent expenditure has a positive and significant impact on inflation rate.

Review of empirical literature has shown that most literature did not disaggregate government expenditure into recurrent and capital. Most studies in Nigeria used total government expenditure. The very few studies that disaggregated government expenditure examined the effect of the disaggregated variables on investment and economic growth and not on inflation. This research will contribute to existing studies by decomposing government expenditure into recurrent and capital, to ascertain the effect of each spending on inflation in Nigeria between 1981 and 2019. The study also differs from previous works by examining the effect of shocks in government expenditure, both capital and recurrent on inflation in Nigeria.

METHODOLOGY

In this study, demand pull theory was used to justify the Keynesian approach to inflation. According to the theory, demand-pull inflation occurs when aggregate demand exceeds aggregate supply at full employment level of output. Keynes explained inflation through the inflationary gap, which exists when the aggregate demand exceeds the level of output at full employment level (Vaish, 1978). This implies that once an economy has reached the point of full employment, any slight increase in aggregate demand over the available output will obviously lead to a rise in price. Government spending is a tool that brings stability in the short run but needs to be done cautiously as too much of public expenditure would lead to inflationary situation while too little of it would lead to unemployment. From Keynesian thought, public expenditure can contribute positively to economic growth. Hence, an increase in the government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government expenditure augments the aggregate demand, which provokes an increased output depending on expenditure multiplier. Thus, the study hinges on the Keynesian theory of inflation.

Model Specification

The conceptual representation of the model is given as follows:

$$INF = f(GCXP, EXR, IR) \dots\dots\dots (3.1)$$

$$INF = f(GRXP, EXR, IR) \dots\dots\dots (3.2)$$

Where INF is inflation rate (annual consumer prices %), GCXP is Government capital expenditure (N Billion). GRXP is Government recurrent expenditure (N Billion), EXR is official exchange Rate (N/US\$), IR is interest Rate (annual Interest Rate)

The econometric representation of the first model becomes:

$$INF = \alpha_0 + \alpha_1 \ln GCXP + \alpha_2 EXR + \alpha_3 \ln IR + \mu \dots\dots\dots (3.3)$$

Where:



α_0 = Constant of the regression model, α_1 =Coefficient of log of government capital expenditure in the model (keeping other variables constant). α_2 = Coefficient of log of official exchange rate in the model (keeping other variables constant), α_3 = Coefficient of official interest rate in the model (keeping other variables constant), μ =Error term (capture exogenous factors)

The econometric representation of the second model becomes:

$$INF = \alpha_0 + \alpha_1 \ln GRXP + \alpha_2 \ln EXR + \alpha_3 IR + \mu \dots \dots \dots (3.4)$$

Where: α_1 = Coefficient of log of government recurrent expenditure in the model (keeping other variables constant) and other variables are as defined in the first model. Data is sourced from Central Bank of Nigeria Statistical bulletin,

Estimation Technique

Auto Regressive Distributed Lag Method (ARDL)

In analyzing the effect of government expenditure (capital and recurrent) on inflation in Nigeria, an Auto Regressive Distributed Lag (ARDL) model framework is employed. The ARDL approach yields consistent estimates of the long-run coefficients that are asymptotically normal, irrespective of whether the underlying regressors are I(1) or I(0), and also works well with small samples. It estimates simultaneously the long-run and short-run parameters. Two ARDL models are estimated to decompose the effect of government capital and recurrent expenditure on inflation in Nigeria. . The first ARDL model is given as:

$$INF_t = \sum_{i=1}^n \beta_1 \Delta \ln GCXP_{t-1} + \sum_{i=1}^n \beta_2 \Delta \ln EXR_{t-1} + \sum_{i=1}^n \beta_3 \Delta IR_{t-1} + \alpha_1 \ln GCXP_{t-1} + \alpha_2 \ln EXR_{t-1} + \alpha_3 IR_{t-1} + \mu_t \dots \dots \dots (3.5)$$

The second ARDL model is given as:

$$INF_t = \sum_{i=1}^n \beta_1 \Delta \ln GRXP_{t-1} + \sum_{i=1}^n \beta_2 \Delta \ln EXR_{t-1} + \sum_{i=1}^n \beta_3 \Delta IR_{t-1} + \alpha_1 \ln GRXP_{t-1} + \alpha_2 \ln EXR_{t-1} + \alpha_3 IR_{t-1} + \mu_t \dots \dots \dots (3.6)$$

Where β_1 to β_3 are the short run coefficients and α_1 to α_3 are the long run coefficients of the variables.



VAR Variance Decomposition and Impulse Response Function

To determine the response of inflation to unanticipated changes in government expenditures, the VAR variance decomposition and impulse response function is employed. The impulse response function graphs give more understanding about the interaction between variables in the short-run. At large IRF analysis in time series analysis is important in determining the effects of external innovations on the variables of the system (i.e. how an unexpected change in one variable at the beginning affects another variable through time). The VAR system of equations is given as:

$$\begin{aligned}
 \begin{bmatrix} INF_t \\ LGCP_t \\ LGRXP_t \\ INT_t \\ LEXC_t \end{bmatrix} &= \begin{bmatrix} \phi_0 \\ \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \end{bmatrix} + \begin{bmatrix} \beta_{11t} & \gamma_{12t} & \alpha_{13t} & \lambda_{14t} \\ \beta_{21t} & \gamma_{22t} & \alpha_{23t} & \lambda_{24t} \\ \beta_{31t} & \gamma_{32t} & \alpha_{33t} & \lambda_{34t} \\ \beta_{41t} & \gamma_{42t} & \alpha_{43t} & \lambda_{44t} \\ \beta_{51t} & \gamma_{52t} & \alpha_{53t} & \lambda_{54t} \end{bmatrix} \begin{bmatrix} INF_{t-p} \\ LGCP_{t-p} \\ LGRXP_{t-p} \\ INT_{t-p} \\ LEXC_{t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon INF_t \\ \varepsilon LGCP_t \\ \varepsilon LGRXP_t \\ \varepsilon INT_t \\ \varepsilon LEXC_t \end{bmatrix} \\
 \begin{bmatrix} INF_t \\ LGCP_t \\ LGRXP_t \\ INT_t \\ LEXC_t \end{bmatrix} &= \begin{bmatrix} \phi_0 \\ \phi_1 \\ \phi_2 \\ \phi_3 \\ \phi_4 \\ \phi_5 \end{bmatrix} + \begin{bmatrix} \beta_{11t} & \gamma_{12t} & \alpha_{13t} & \lambda_{14t} \\ \beta_{21t} & \gamma_{22t} & \alpha_{23t} & \lambda_{24t} \\ \beta_{31t} & \gamma_{32t} & \alpha_{33t} & \lambda_{34t} \\ \beta_{41t} & \gamma_{42t} & \alpha_{43t} & \lambda_{44t} \\ \beta_{51t} & \gamma_{52t} & \alpha_{53t} & \lambda_{54t} \end{bmatrix} \begin{bmatrix} INF_{t-p} \\ LGCP_{t-p} \\ LGRXP_{t-p} \\ INT_{t-p} \\ LEXC_{t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon INF_t \\ \varepsilon LGCP_t \\ \varepsilon LGRXP_t \\ \varepsilon INT_t \\ \varepsilon LEXC_t \end{bmatrix}
 \end{aligned}
 \tag{3.7}$$

Equation (3.7) is used to trace the variance decomposition and impulse response and is regarded as the Vector Autoregressive (VAR) model. The impulse response functions, that is, the effects of the various shocks of the explanatory variables on the dependent variables can be determined by differentiating equation (3.7) with respect to each of the shocks ($\varepsilon_{1t}, \dots, \varepsilon_{nt}$).



RESULTS AND DISCUSSION

Descriptive Statistics

This is done to summarize the basic features of the data. The results of the descriptive statistics are presented in Table 4.1.

Table 4.1: Descriptive Statistics

	INF	GCP	GRXP	EXC	INTEREST
Means	19.3207	418.8153	1391.228	90.17979	16.76974
Median	12.55000	289.3340	455.6310	97.39930	16.92000
Maximum	72.80000	1682.100	7138.900	364.5000	31.65000
Minimum	5.400000	1.410987	1.558145	0.494296	2.230000
Std. Dev.	17.25642	430.4223	1893.602	1.977721	5.862368
Skewness	1.725642	0.569952	1.459473	0.753943	-0.158070
Kurtosis	4.831534	1.782570	1.737908	2.277680	3.312029
Jarque-Bera	24.51014	4.404071	3.165204	4.426155	0.312403
Probability	0.000005	0.110578	0.205440	0.109364	0.855387

Source: Author's Computation (2023)

From the summary statistics presented above, it is evident that each of the variables has a positive mean value with government recurrent expenditure and interest rate having the highest and the lowest mean values, respectively. Also, the standard deviation of each variable gives a more accurate and comprehensive estimate of dispersion, because an outlier can largely overstate the range of observations. The probability values of the Jarque–Bera statistics suggest the non-rejection of the null hypothesis, for most of the variables – implying the normality of the residual. Finally, the minimum and maximum values describe each variable as it appears, in terms of the lowest and highest values in each series.

Correlation Matrix

The correlation matrix shows the association between variables. It explains the degree of association existing among the variables, whether positive or negative. It is also used to know the level of multicollinearity in the model analyzed.

Table 4.2.1: Correlation Matrix for Model I

	INF	GCXP	EXCH	INT
INF	1	-0.376	-0.331	0.076
GCXP	-0.376	1	0.496	-0.118
EXCH	-0.331	0.496	1	-0.107
INT	0.076	-0.118	-0.107	1

Source: Author's Computation (2023)

The table shown above depicts the correlation matrix for the first model. However, there is no correlation coefficient that exceeds or is even close to 0.70. For this reason, in this model, there is no problem of multicollinearity which enhances the reliability for regression analysis.

**Table 4.2.2: Correlation Matrix for Model II**

	INF	EXCH	INT	GRXP
INF	1	0.331	0.076	-0.285
EXCH	-0.331	1	-0.107	0.536
INT	0.076	-0.107	1	-0.234
GRXP	-0.285	0.536	-0.234	1

Source: Author's Computation (2023)

The table shown above depicts the correlation matrix for the second model. Similarly, for this model, there is no correlation coefficient that exceeds or is even close to 0.70. For this reason, there is no problem of multicollinearity which enhances the reliability of the model for regression analysis.

4.3 Unit Root Test

The unit root test is essential in order to ensure that the variables are estimated in their stationary forms to avoid spurious results. To do this, the Augmented Dickey-Fuller (ADF) and Phillip Perron (PP) tests are employed. The essence is to test the null hypothesis of unit root or non-stationary stochastic processes. To reject this, the ADF and PP statistic must be more negative than the critical values at either 1%, 5% & 10% significance levels respectively.

Table 4.3: Unit Root Test Result

Variable	ADF Test Statistic at level (I ₀)	ADF Test Statistic at first difference (I ₁)	PP Test at level (I ₀)	PP Test at first difference (I ₁)	Decision value
INT RATE	-3.313	-----	-3.615	-----	1(0)
INFLATION	-2.930	-5.685	-2.801	-9.848	1(1)
RECURRENT EXPENDITURE	-2.144	-8.087	-1.619	-8.082	1(1)
CAPITAL EXPENDITURE	0.693	-7.141	0.046	-7.941	1(1)
EXCHANGE RATE	-1.500	-4.099	-1.306	-4.130	1(1)
CRITICAL VALUES					
1%	-3.615	-3.621	-3.615	-3.621	
5%	-2.941	-2.943	-2.941	-2.943	
10%	-2.609	-2.610	-2.609	-2.610	

Source: Author's Computation (2023)

Table 4.3.1 shown above reports unit root test for all our variables using the ADF and PP Test. Interest rate is integrated of order zero 1(0), while inflation, government recurrent expenditure,



government capital expenditure and exchange rate are integrated of order one I (1). This justifies our choice of ARDL methodology as variables exhibit a mix of integration order 1(0) and 1(1).

4.4 Bound Test for Linear Co-integration

In this study, we test the null hypothesis by means of F-statistics, given that:

Null Hypothesis $H_0: \phi_1 = \phi_2 = \phi_3 = \phi_4 = 0$

Alternative Hypothesis $H_1: \phi_1 \neq \phi_2 \neq \phi_3 \neq \phi_4 \neq 0$

The F-statistic value is compared against the two critical value bounds (upper and lower bounds). The upper bound applies when all the variables are integrated of order one, I (1) while the lower bound assumes all the variables are integrated of order zero, I (0). If the calculated F-statistics value exceeds the upper bound, then the null hypothesis of no cointegration is rejected. If the calculated F-statistics value is lower than the lower bound critical value, then the null hypothesis cannot be rejected. However, conclusive inference with regards to cointegration cannot be reached if the calculated F-statistics falls within the critical bounds.

The bounds test is more efficient for a small sample size and is applicable even when variables show any signs of endogenous properties as it makes corrections for any residual serial correlation.

Table 4.4.1: Bound Test Result for Model I:

F-Statistic	9.520***		
Critical Values	1%	5%	10%
Lower Bound	3.65	2.79	2.37
Upper Bound	4.66	3.67	3.20

Note: *** indicates significance and rejection of the null hypothesis of no cointegration at 1% significance level.

Source: Author's Computation (2023)

Table 4.4.1 reported above shows the Bound-Test for linear co-integration. This approach is used for testing whether or not there is a long-run relationship (co-integration) between the variables employed. The criterion for rejecting the null hypothesis of no cointegration is that the F-Statistic should be greater than the lower and upper bound at 1%, 5% or 10%. Since the calculated F-Statistic (9.520) is greater than the upper bound at 1%, 5% and 10%, we therefore establish a long-run relationship between the variables.

Table 4.4.2: Bound Test Result for Model II:

F-Statistic	5.070***		
-------------	----------	--	--



Critical Values	1%	5%	10%
Lower Bound	3.65	2.79	2.37
Upper Bound	4.66	3.67	3.20

Note: *** indicates significance and rejection of the null hypothesis of no cointegration at 1% significance level.

Source: Author's Computation (2023)

Table 4.4.2 reported above shows the Bound-Test for linear co-integration. This approach is used for testing whether or not there is a long-run relationship (co-integration) between the variables employed. The criterion for rejecting the null hypothesis of no cointegration is that the F-Statistic should be greater than the lower and upper bound at 1%, 5% or 10%. Since the calculated F-Statistic (5.070) is greater than the upper bound at 1%, 5% and 10%, we therefore establish a long-run relationship between the variables.

ARDL Estimation Results

ARDL results to evaluate the effect of government capital expenditure on inflation in Nigeria.

Results of the ARDL are reported in this section. This explains the effect of government capital expenditure on inflation in Nigeria. The short and long-run estimates for all variables are presented using the ARDL framework.

Table 4.5.1.1: ARDL Result for Model I

Dependent Variable: Inflation				
Selected Model: 2,4,4,4				
Variable	Coefficient	Standard Error	T-Statistics	Probability
LONG RUN ESTIMATES				
LNGCP	-7.948	5.691	-1.396	0.188
LNEXC	-2.830	6.528	-0.433	0.672
LNINT	0.825	14.654	0.056	0.956
C	73.616	55.851	1.318	0.212
SHORT RUN ESTIMATES				
DLNINF(-1)	0.762	0.113	6.719	0.000**
DLNGCP	-15.382	4.075	-3.774	0.003***
DLNGCP(-1)	5.259	4.568	1.151	0.272
DLNGCP(-2)	-1.059	3.802	-0.279	0.785
DLNGCP(-3)	7.718	3.486	2.214	0.047**
DLNEXC	20.079	6.898	2.911	0.013***
DLNEXC(-1)	-12.875	4.224	-3.048	0.010***
DLNEXC(-2)	13.371	4.537	2.947	0.012***
DLNEXC(-3)	-11.383	4.182	-2.722	0.018**
DLNINT	-21.011	2.318	-9.062	0.000***
DLNINT(-1)	-16.771	3.420	-4.904	0.000***



DLNINT(-2)	-19.233	3.693	-5.208	0.000***
DLNINT(-3)	-18.614	3.924	-4.743	0.000***
ECM	-0.939	0.118	-7.966	0.000***
R ² = 0.92				
Adjusted R ² = 0.86				
D.W. Statistics = 2.33				

Note: ***, ** and * indicate probability values at 1%, 5% and 10% respectively.

Source: Author's Computation (2023)

The ARDL results shown above depicts the short and long run relationship existing among the variables. In the long run, all the independent variables (government capital expenditure, exchange rate and interest rate) do not have a significant relationship with inflation. However, short run estimates reveal that one lagged value of inflation has a significant relationship with current inflation at 1% significance level. One lagged value of inflation has a positive relationship with current inflation as a percentage increase in the one lagged value of inflation will increase current inflation by 0.76 units.

Similarly, in the short run, current government capital expenditure has a negative and significant relationship with inflation at 1% level of significance. A percentage increase in government capital expenditure in the current period will reduce inflation by 15.38 units. Conversely, three lagged value of government capital expenditure show significant and positive relationship with inflation at 5% significance level. A percentage increase in government capital expenditure in this period will increase inflation by 7.72 units.

Exchange rates in the current, one, two and three lagged periods, have significant relationship with inflation at 1% level of significance. In the current and two lagged periods, a percentage increase in exchange rate will increase inflation by 20.08 and 13.37 units respectively. This can be justified by the fact that the Nigerian economy was largely import-driven in this period. The findings by Babatunde (2017), Adenuga et al. (2013), and Inyama and Ekwe (2014) amongst others conforms with a-priori expectation for an import-driven economy like Nigeria. In the one and three lagged periods, a percentage increase in exchange rate reduced inflation by 12.87 and 11.38 units respectively. The negative relationship could be as a result of the Central Bank's intervention in the foreign exchange market to control inflation. It could be as a result of the sustained reform in the foreign exchange market to curb spurious demand for foreign exchange. This can also be justified by the fact that imports are being discouraged as a result of the increase in exchange rate, thereby encouraging consumers to purchase locally-made products. This in turn will enhance domestic production and reduce domestic prices.

Interest rate is seen to have negatively significant relationship with inflation in the current period, one, two and three lagged periods at 1% respectively. A unit increase in interest rate in these periods will reduce inflation by 21.01, 16.77, 19.23, and 18.61 units respectively. This conforms with a-priori expectation because interest rate is a powerful tool used by the monetary authorities in controlling inflation and corroborates findings by Ahiabor (2013).

The error correction term is statistically significant, negative and less than one. This means that the speed of adjustment from short-run to long-run equilibrium given any shock in the model is about 94 percent.

Post Estimation Diagnostic Test on Model I

Some diagnostic tests are carried out after estimating the ARDL result to validate findings.

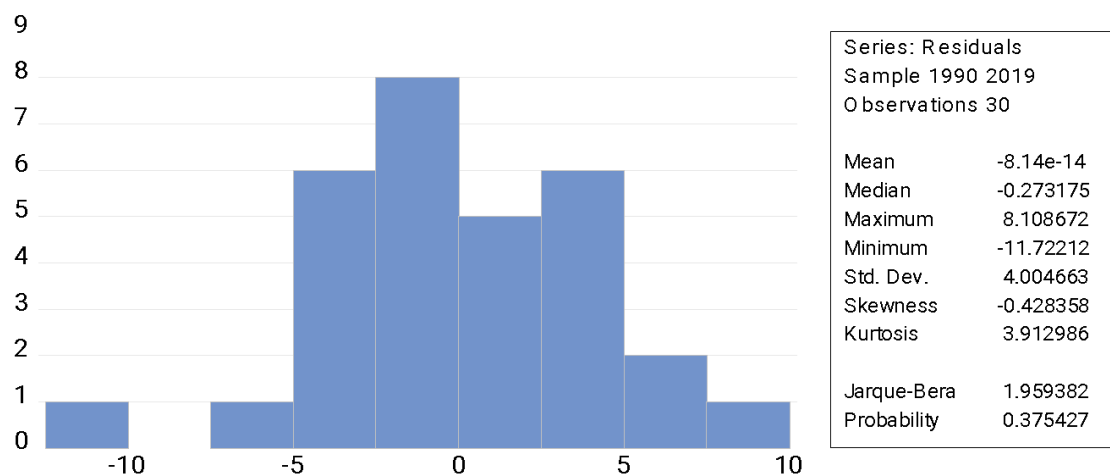


Fig 4.6.1: Jarque Bera Normality Test

Source: Author's Illustration (2023)

The figure shown above depicts the Jarque-Bera test for normality of the distribution. Since the probability value is greater than 0.05%, we conclude that the data is normally distributed.

Breusch-Godfrey Serial Correlation Test

Table 4.6.2.1: Breusch-Godfrey Serial Correlation Test

F-Statistic	0.374	Prob. F (2,10)	0.697
-------------	-------	----------------	-------

Source: Author's Computation (2023)

Since the probability value (0.697) is greater than 0.05, we conclude that there is no evidence of serial correlation in our estimation.

Breusch-Pagan Godfrey Heteroskedasticity Test

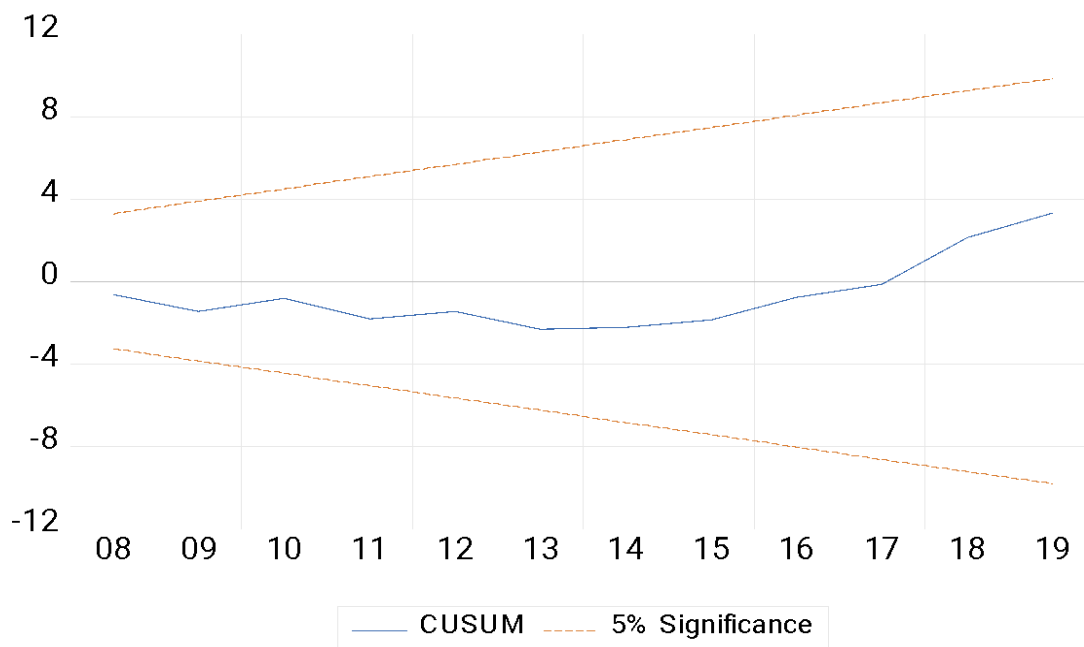
Table 4.6.3.1: Breusch-Pagan Godfrey Heteroskedasticity Test

F-Statistic	0.274	Prob. F (17,12)	0.992
-------------	-------	-----------------	-------

Source: Author's Computation (2023)



Since the probability value (0.992) is greater than 0.05, we conclude that there is no evidence of heteroskedasticity in our estimation.



ARDL results to evaluate the effect of government recurrent expenditure on inflation in Nigeria.

Results of the ARDL of model II are reported in this section. This explains the effect of government recurrent expenditure on inflation in Nigeria. The short and long-run estimates for all variables are presented using the ARDL framework.

Table 4.6.4.1: ARDL Result for Model II

Dependent Variable: Inflation				
Selected Model: 3,3,3,4				
Variable	Coefficient	Standard Error	T-Statistics	Probability
LONG RUN ESTIMATES				
LNGRXP	2424.152	210370.3	0.011	0.991
LNEXC	-2887.239	249630.7	-0.011	0.991
LNINT	9360.947	812517.7	0.011	0.991
C	-31937.54	2777536	-0.011	0.991
SHORT RUN ESTIMATES				
DLNINF(-1)	0.020	0.108	0.184	0.857
DLNINF(-2)	-0.561	0.104	-5.409	0.000***
DLNGRXP	8.883	5.350	1.660	0.121*
DLNGRXP(-1)	-5.456	5.457	-0.999	0.336
DLNGRXP(-2)	13.620	6.656	2.046	0.061*
DLNEXC	11.507	10.195	1.129	0.279



DLNEXC(-1)	12.549	4.884	2.569	0.023**
DLNEXC(-2)	8.222	5.211	1.578	0.139*
DLNINT	-3.153	3.086	-1.022	0.326
DLNINT(-1)	-33.739	7.822	-4.313	0.000***
DLNINT(-2)	-25.557	5.567	-4.591	0.000***
DLNINT(-3)	-17.435	6.048	-2.882	0.013***
ECM	-0.005	0.001	-5.758	0.000***
R ² = 0.92				
Adjusted R ² = 0.87				
D.W. Statistics = 1.8				

Note: ***, ** and * indicate probability value at 1%, 5% and 10% respectively.

Source: Author's Computation (2023)

The ARDL results shown above depict the short and long run relationship existing among the variables. In the long run, all the independent variables (government recurrent expenditure, exchange rate and interest rate) do not have a significant relationship with inflation. However, short run estimates reveal that two lagged value of inflation has a significant relationship with current inflation at 1% level of significance as a percentage increase in the two-lagged value of inflation will reduce current inflation by 0.56 units.

Similarly, in the short run, government recurrent expenditure has a positive and significant relationship with inflation at 10% level of significance. A percentage increase in government recurrent expenditure in the current period will increase inflation by 8.88 units. In the same vein, two lagged values of government recurrent expenditure show significant and positive relationship with inflation at 5% significance level. A percentage increase in government recurrent expenditure in this period will increase inflation by 13.63 units.

Exchange rate can be seen to have a positive relationship with inflation in the one and two lagged periods at 5% and 10% level of significance respectively. A percentage increase in exchange rate in these periods will increase inflation by 12.55 and 8.22 units respectively. Interest rate is seen to have a negatively significant relationship with inflation in one, two and three lagged periods at 1% respectively. A unit increase in interest rate in these periods will reduce inflation by 33.74, 25.56 and 17.43 units respectively. This conforms to a-priori expectation because interest rate is a powerful tool used by the monetary authorities in controlling inflation and corroborates findings by Ahiabor, 2013.

The error correction term is statistically significant, negative and less than one. This means that the speed of adjustment from short-run to long-run equilibrium given any shock in the model is about 0.5 percent.

Post Estimation Diagnostic Test on Model I

Some diagnostic tests are carried out after estimating the ARDL result to validate findings.

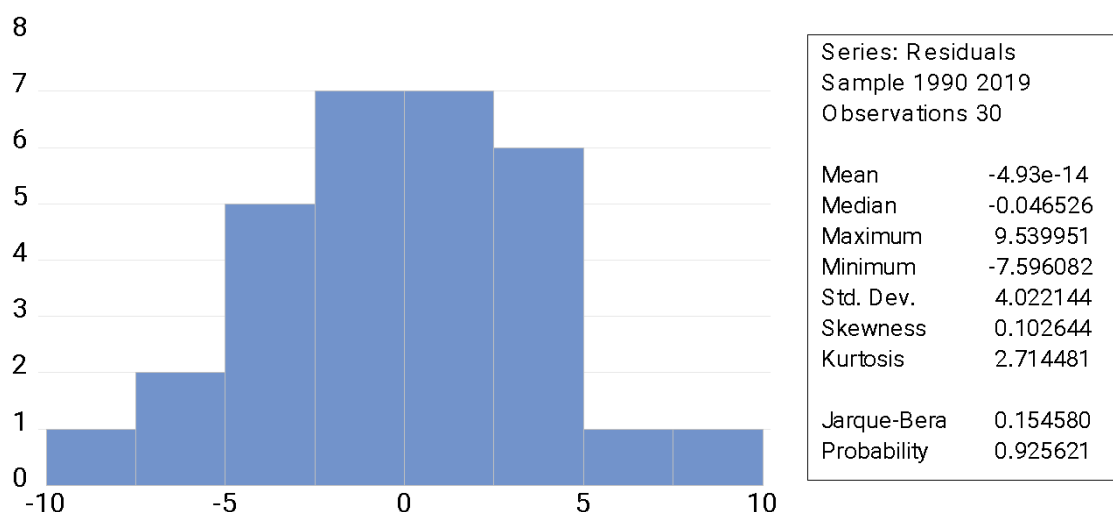


Fig 4.6.5.2: Jarque Bera Normality Test

Source: Author's Illustration (2023)

The figure shown above depicts the Jarque-Bera test for normality of the distribution. Since the probability value is greater than 0.05%, we conclude that the data is normally distributed.

Breusch-Godfrey Serial Correlation Test

Table 4.6.6.1: Breusch-Godfrey Serial Correlation Test

F-Statistic	0.027	Prob. F (2,11)	0.974
-------------	-------	----------------	-------

Source: Author's Computation (2023)

Since the probability value (0.974) is greater than 0.05, we conclude that there is no evidence of serial correlation in our estimation.

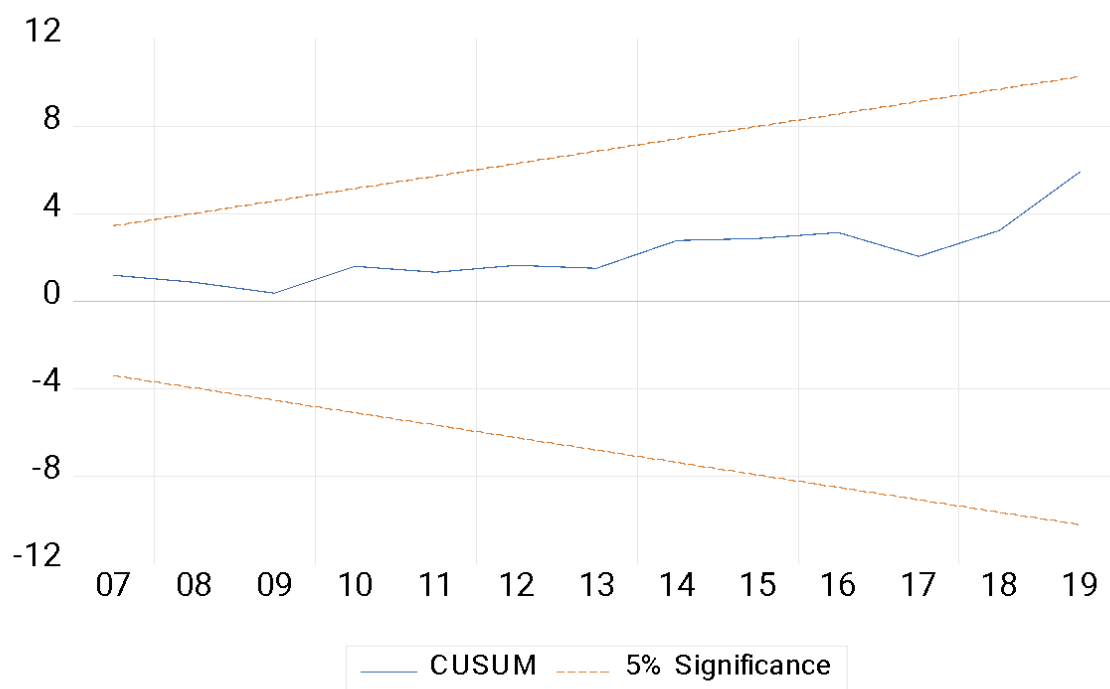
Breusch-Pagan Godfrey Heteroskedasticity Test

Table 4.6.7.1: Breusch-Pagan Godfrey Heteroskedasticity Test.

F-Statistic	0.683	Prob. F (16,13)	0.767
-------------	-------	-----------------	-------

Source: Author's Computation (2023)

Since the probability value (0.767) is greater than 0.05, we conclude that there is no evidence of heteroskedasticity in our estimation.



4.7: Variance Decomposition and Impulse Response to evaluate the response of inflation to an unanticipated change in government capital and recurrent expenditure.

Variance Decomposition Analysis

Variance Decomposition test is used to analyze the percentage of unexpected variation in each variable that is produced by shocks from other variables. This test is therefore suitable for examining the effect of an unanticipated shock in capital and recurrent expenditure on inflation in Nigeria. The table below presents the result of the Forecast Error Variance Decomposition result.

Table 4.7.1.1: Forecast Error Variance Decomposition (FEVD) Result

Variance Decomposition: Inflation						
Period	S.E	GCP	GRXP	INF	EXC	INT
1	12.621	0.000	0.000	100.000	0.000	0.000
2	15.330	5.822	1.308	90.861	0.533	1.474
3	15.833	7.426	1.991	85.868	0.581	4.133
4	16.267	7.263	2.081	85.241	0.991	4.424
5	16.599	6.989	2.019	85.381	1.091	4.519
6	16.697	6.942	2.098	84.950	1.089	4.921
7	16.731	6.914	2.140	84.822	1.094	5.029
8	16.820	6.955	2.164	84.794	1.104	4.982
9	16.872	7.112	2.152	84.581	1.125	5.029



10	16.894	7.246	2.147	84.366	1.156	5.086
----	--------	-------	-------	--------	-------	-------

Source: Author's Computation (2023)

From the table shown above, the variance decomposition result suggests that from short run to long run, forecast error variance of inflation is mostly explained by itself and therefore exerts strong endogeneity on itself. Shocks to government capital expenditure as presented in table 4.11 above accounts for about 5.8 percent of shocks to inflation in the second year, rising to 7.4 percent in the third year, and then exhibiting slight declining effects to about 6.9 percent in the eighth year, before rising again to 7.1 and 7.2 percent in the ninth and tenth years consecutively. FEVD results also reveal that the effect of an unanticipated shock in government recurrent expenditure on inflation is lower than the effect of an unanticipated shock in government capital expenditure. Shocks in government recurrent expenditure contributed 1.3 percent to shocks in inflation in the second year, whilst rising consistently to 2.1 percent in the tenth year.

For interest rate, it exhibits a weak influence on inflation in the second year with a shock to interest rate accounting for 1.4 percent of shocks to inflation in this period. The influence is seen to be increasing consistently from the seventh year, showing about 5.0 percent in the seventh year before declining marginally to 4.9 percent in the eighth year and rising again marginally in the ninth and tenth years. Exchange rate has a dismal influence on inflation in the short and long run. Results show less than 1 per cent contribution in the second and third year to 1.1 percent in the tenth year.

Impulse Response test

Impulse response functions (IRFs) show the effects of shocks on the adjustment path of the variables in the VAR model. IRFs can be graphically presented showing the effect of shocks on the current and future path of the variables under consideration. In essence, IRs show how these variables react to different shocks in the model. In the impulse response graphs, the solid blue lines show the responses of the endogenous variables to an innovation, while the dashed lines indicate the boundaries of 95% confidence intervals. If both the upper bound and the lower bound limit does not cross the zero line, then an innovation to an endogenous variable under consideration has no effect on that particular variable (meaning the innovation is not statistically significant).

Also, the effect of a one-time innovation is regarded as transitory shock if the variable shows a tendency to converge to zero; but if it does not, then it is considered to be a permanent shock. The IRF graphs below show the response of inflation to shocks in government capital and recurrent expenditure.

Response to Cholesky One S.D. (d.f. adjusted) Innovations – 2 S.E.

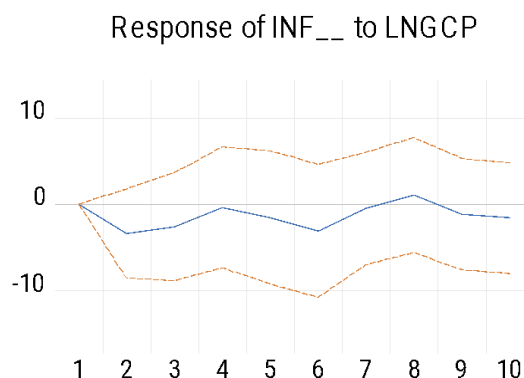


Fig. 4.8.1: Impulse response of inflation to government capital expenditure

Source: Author's Illustration (2023)

The figure shown above depicts the response of inflation to a one standard deviation shock of government capital expenditure. It shows that the shocks to government capital expenditure are statistically significant and exert a negative effect on inflation in most periods. A shock to government capital expenditure causes inflation to reduce in the initial period, before becoming mean reverting in the fourth period. The fifth and sixth period are again witnessed by negative effects until the seventh period is reached where it reverts to zero, becoming slightly positive in the eighth period and declining negatively again in the ninth and tenth periods. It can therefore be concluded that shocks to government capital expenditure majorly have negative effects on inflation.

Response to Cholesky One S.D. (d.f. adjusted) Innovations – 2 S.E.

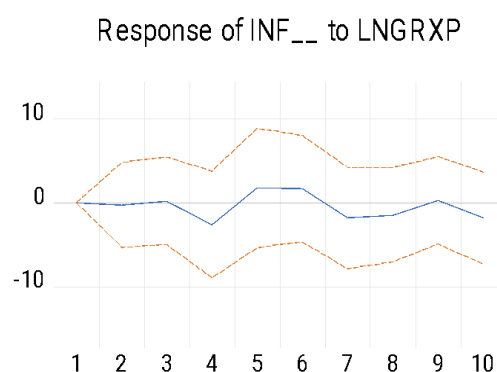


Fig. 4.8.2: Impulse response of inflation to government recurrent expenditure

Source: Author's Illustration (2023)



The figure shown above depicts the response of inflation to a one standard deviation shock of government recurrent expenditure. It shows that the shocks to government recurrent expenditure are statistically significant and exert both positive and negative effects on inflation. In the initial period, given a shock to government recurrent expenditure, inflation tends to be stable in the steady state before declining into the negative state in the fourth period. Inflation is seen to be gradually increasing and becoming positive in the fifth period where it remains relatively stable for some time. Inflation again entered the negative region in the seventh period and remained negative until the ninth period, where it reverted to the mean before the sharp decline in the tenth period. It can therefore be concluded that shocks to government recurrent expenditure majorly have asymmetric effects on inflation.

CONCLUSION AND RECOMMENDATION

The study examined the effect of government expenditure, both recurrent and capital on inflation in Nigeria by analyzing them in two different models. Similarly, the study also examined the effect of shocks in government expenditure (recurrent and capital) on inflation in Nigeria. In achieving this, the ARDL and VAR Variance Decomposition and Impulse Response tests were employed for yearly time series data spanning from 1981 to 2021. The study found that long and short run relationships exist among the variables.

In the short run, government recurrent expenditure in its current and two lagged periods were seen to have significantly positive relationship with inflation. Government capital expenditure on the other hand has a negative relationship with inflation in the current period and positive relationship with inflation in the three lagged period. Exchange rate was also seen to significantly affect inflation in the current period at 5% level of significance. In the same vein, interest rate has a negatively significant relationship with inflation in the current period, one and two lagged periods respectively. Unanticipated shocks from government expenditure to inflation are also seen to be temporary as they mean reverting. It is therefore recommended that the government should maintain a good strategic balance between capital and recurrent expenditure to prevent the economy from being consumption-based. Similarly, an increase in exchange rate was seen to affect inflation positively, thus establishing imported inflation. Therefore, an Import-Substitution strategy for reducing imported inflation should be embraced. This will encourage and promote domestic production and reduce the effect of exchange rate fluctuations on inflation. Following the negative influence of interest rate on inflation, a contractionary monetary policy should be maintained by the monetary authority to control inflationary pressure.

REFERENCES

- Abdullahi, S. I., Shuaibu, M., Abubakar, B. U., Muhammad, H. M., & Oluwafemi, K. I. (2022). Public expenditure profile and Economic dynamism in Nigeria: A quasi general equilibrium analysis, *J Eco Res & Rev*, 2 (3), 241-251.
- Adeleye, N., Ogundipe, A. A., Ogundipe, O., Ogunrinola, I., & Adediran, O. (2019). Internal and external drivers of inflation in Nigeria. *Banks Bank Syst*, 14(4), 206-218.
- Adenuga, A.O., Hilili, M.J and Evbuomwan O.O. Oil price pass-through into inflation: Empirical evidence from Nigeria. *CBN Economic and Financial Review* 50: 1-28. 2012.



- Ahiabor, Godwin. The effects of monetary policy on inflation in Ghana. *Developing Country Studies*, 3.12: 82-89. (2013).
- Akobi, K. C., Umeora, C. E., & Atueyi, C. L. (2021). Government Expenditure and Inflation Rate in Nigeria. *International Journal of Business Systems and Economics*, 13(4), 276-293.
- Anyanwu, J. (2016). Government Expenditure and Economic Growth Nexus – Quest Journals (2016).
- Babatunde, Musiliu .A. Trade openness and inflation in Nigeria: A Non-linear ARDL analysis. *Journal of Economics and Sustainable Development* Vol.8.24:129-135. 2017.
- Dada, M. A., & Abalaba, B. P. (2018). Government Expenditure Growth and Inflation in Nigeria; Any Evidence of Causality?. In *Proceedings of Second Interdisciplinary International Conference* (Vol. 2, No. 3).
- Dikeogu, C. C. (2018). Public spending and inflation in Nigeria. *International Journal of Advanced Academic Research. Social and Management Sciences*, 4, 12.
- Ebisine, L., & Oki, B. Public Expenditure and Inflation in Nigeria. *INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS* ISSN(print): 2643-9840, ISSN(online): 2643-9875 Volume 04 Issue 07 July 2021 DOI: 10.47191/ijmra/v4-i7-10, Impact Factor: 6.072 Page No.- 929-938 IJMRA, Volume 4 Issue 7 July 2021 www.ijmra.in Page 929 Public Expenditure and Inflation in Nigeria
- George-Anokwuru, C. C., & Ekpenyong, B. I. (2020). Government expenditure and inflation in Nigeria. *Journal of Economics and Management Sciences*, 3(2), p29-p29.
- Inyiama, O.I. and Ekwe, M.C. Exchange Rate and Inflationary Rate: Do They Interact? Evidence from Nigeria. *International Journal of Economics and Finance*; Vol. 6.3:80-87. 2014.
- Iwuoha, J. C. (2020). Impact of Fiscal Policy on Nigeria's Macro-Economic Performance. *Impact of Fiscal Policy on Nigeria's Macro-Economic Performance. Electronic Research Journal of Social Sciences and Humanities*, 2.
- Kia, A., & Jafari, M. (2020). Forward-looking agents and inflation in an oil-producing country: Evidence from Iran. *Journal of Asian Economics*, 69, 101217.
- Komain, J., & Brahmasrene, T. (2007). The relationship between government expenditures and economic growth in Thailand. *Journal of Economics and Economic Education Research*, 8(1), 93-102.
- Liu, L. C. H., Hsu, C. E., & Younis, M. Z. (2008). The association between government expenditure and economic growth: Granger causality test of US data, 1947-2002. *Journal of Public Budgeting, Accounting & Financial Management*, 20(4), 439-452.
- Madito O. and Odhiambo N. M. (2018) "The Main Determinants of Inflation in South Africa: an Empirical Investigation", *Organizations and Markets in Emerging Economies*, 9(2), pp. 212-232. doi: 10.15388/omee.2018.10.00011.
- Maku, O. E., Mustapha, B. H., Okutimiren, A. O., Oshinowo, B. O., & Ajike, E. O. (2022). Government Expenditure and Selected Macroeconomic Variables in Nigeria: A Bayesian VAR Approach. *Asian Journal of Economics, Finance and Management*, 21-30.
- Nguyen, T. D. (2019). Impact of government spending on inflation in Asian emerging economies: Evidence from India, China, and Indonesia. *The Singapore Economic Review*, 64(05), 1171-1200.
- Nwamuo. C. (2022) Public expenditure and inflation rate in Nigeria: An empirical analysis. *World Journal of Advanced Research and Reviews*, 2022, 16(03), 411–418



-
- Okeke C.C., Ohazulume C.G., Emerenini F. (2022), The Determinants of Inflation in Nigeria. *African Journal of Economics and Sustainable Development* 5(3), 54-72. DOI: 10.52589/AJESDVLI3AGIB
- Oyerinde, A. A. (2019). An assessment of the nexus between government expenditure and inflation in Nigeria. *Folia Oeconomica Stetinensia*, 19(2), 102-116.
- Rangkuty, D. M., Nasution, L. N., & Patmawati, K. How do the Causality of Inflation and Government Expenditure in Indonesia?. *International Journal of Economics and Management Studies (SSRG-IJEMS)* – Volume 7 Issue 5 – May 2020 ISSN: 2393 - 9125
- Sriyana, J. (2019). Price stabilization policy in an emerging economy: An asymmetric approach. *Journal of International Studies*, 12(2), 165-181.