

GOVERNMENT EXPENDITURE AND INFLATION RATE IN NIGERIA: AN EMPIRICAL ASSESSMENT

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Abstract

This paper investigates the correlation between Nigeria's government expenditure and inflation rate within a multivariate framework from 1970-2020. Data sourced from the National Bureau of Statistics, the Central Bank of Nigeria and the World Bank were utilized for this investigation. To ascertain if there exists any relationship among the variables, in the long run, the ARDL test was used. From the result, a long-run relationship exists between the variables in the model; the influence of government expenditure on the inflation rate in the short and long run is negative and insignificant, while that of exchange rate on the inflation rate is positive and insignificant in both periods; the influence of money supply on inflation rate both in the short and long run is positive and significant. Consequently, the research proposed that more government expenditure should go into productive activities, thus, boosting aggregate production in the economy as this tends to reduce the level of inflation. Furthermore, the increase in money supply has to be incessantly moderated by the CBN as a result of its ability to cause needless inflationary pressures in the Nigerian economy.

Keywords: Inflation Rate, Government Expenditure, Money Supply, Exchange Rate, ARDL Test

JEL Codes: E31; E51; E62

1. INTRODUCTION

Globally, the need for government expenditure in any economy varies occasionally. It is a standard presumption that government expenditure supports the growth objectives of all economies worldwide (Ajudua, 2018) and as such is an important macroeconomic policy instrument available to the government for promoting growth. Generally, the government carries out expenditures on numerous projects or programs such as roads, power, education, health care, economic welfare of its citizens, protection of life and properties, etc. Given that government

expenditure has been suggested to contribute to growth, the relationship between government expenditure and economic growth in developing nations is an essential issue. Government expenditure on social and economic infrastructure can boost emerging industries, lower unemployment and poverty rates, stabilize general prices in the economy, raise people's standards of living, and encourage higher productivity, all of which can improve the economy's performance (Ajudua & Ojima, 2015). The Keynesian economists were of the opinion that the obligation of governments to carry out their expenditure is to guarantee that the economy is stable, intensify productive activities and assure the reallocation of income between the wealthy and indigent. On the other hand, the assertion that rising government expenditure might decelerate how the economy functions generally are the perception of classical economists. For instance, if the government attempts to finance its increasing expenditures, it may raise taxes and/or borrow, reducing individuals' disposable income. From the perspective of neo-classical economists, government expenditure by means of intervention programs could lead to high levels of inflation based on the assumption of full employment (Olayungbo, 2013). The neo-classical believed enhanced government expenditure makes economic tightening worse by transferring incomes from the private to the public sector.

Inflation is the incessant rise in the general price level in an economy; it is a key trepidation for policymakers (Bawa, Abdullahi & Ibrahim, 2016). Even when macroeconomic shocks are non-existent, inflation exhibits the propensity of making a replica of itself from one phase to the other (Novaes 1993; Durevall 1999; Campêlo & Cribari-Neto 2003). Inflation is a conventional macroeconomic snag bedevilling both developed and less developed nations. Over the past decades, this phenomenon has been on the increase in developing economies and Nigeria is not an exception. In Nigeria, several factors have been recognized to be accountable for causing inflation. These include exchange rate (Akinbobola, 2012; Ogundipe & Egbetokun 2013; Audu & Amaegberi 2013), fiscal deficits (Ezeabasili, Mojekwu & Herbert 2012; Medee & Nenbee 2012; Ozurumba 2012), government spending (Olayungbo 2013; Ojarikre, Ezie & Torke 2015; Ogbole & Momodu 2015), money supply (Olorunfemi & Adeleke, 2013; Maku & Adelowokan 2013; Dikeogu, 2018). In addition, other factors such as social, economic, political and business have been identified as increasing the rate of inflation in Nigeria (Masha, 2000; Mordi, Essien, Adenuga, Omanukwue, Ononugbo, Oguntade, Abeng, & Ajao 2007; Udo, Ben, Abner, Okoh, & Okolo 2019).

Appraising the Nigerian economy from the 1970s, specifically, 1974, when the nation's monetary policy transformed to a direct monetary targeting programme from exchange rate targeting in reaction to inflationary pressure that resulted from augmented government expenditure due to the reconstruction works after the civil war as well as the monetization of the petrodollars, to 2013 depicts that the economy might be whatever but steady inflation one (Asekunowo, 2016).

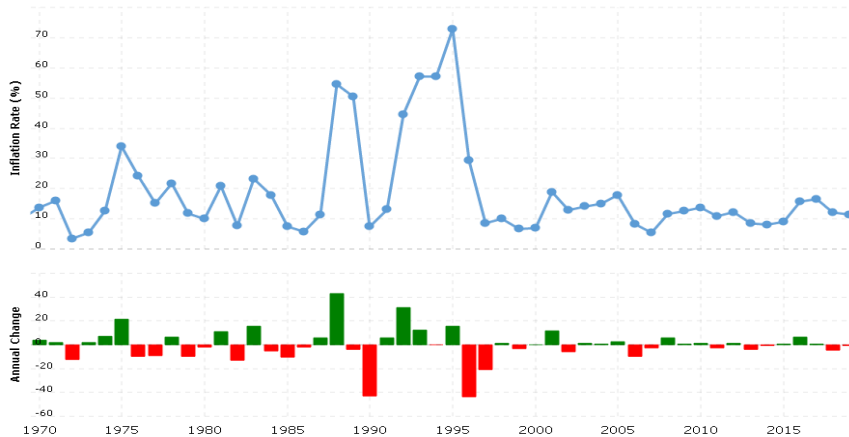


Figure 1. Trend on Inflation Rate and Annual Change in Nigeria

As shown in figure 1 above, the rate of Nigeria’s inflation has been unstable. It has been mutable over the years. For example, it was 13.76% and 20.81% in 1970 and 1981, respectively. In 1990 and 2000 it was 7.36% and 6.93%. According to a CBN report in 2010, Nigeria’s inflation rate was high in 1993 at 57.17% and 72.84% was the highest rate up to now in 1995. By 2015, twenty years later, it reduced to 8.06% (IMF, 2022).

Table 1. Trend Analysis of Government Expenditure

Years	Government Expenditure (N Million)	Government Expenditure Growth Rate (%)
1970 – 1979	4566.60	31.70
1980 – 1989	17,793	23.20
1990 – 1999	302,098	41.24
2000 – 2009	1,833,034	15.82
2010 – 2019	6,945,644.32	5.22

Source: CBN Statistical Bulletin 2020 and World Bank.

The trend of government expenditure in Nigeria as shown in Table 1 indicates that it has been on the increase over the years. For instance, it was N4566.60 million in 1970 – 1979 with a growth rate of 31.70% and rose to N17,793 million in 1980 – 1989 with a growth rate of 23.20. By 1990 – 1999, the period the country returned to democracy after years of military rule, government expenditure was N302,098 million with a growth rate of 41.24%; it increased to NN1,833,034million in 2000 – 2009 and further increased to N6,945,644.32 million in 2010 – 2019 with growth rates of 15.82% and 5.22% respectively. Given this background, this paper seeks to scrutinize the connexion between government expenditure and inflation in Nigeria and to inspect if there exists any long-run relationship between these macroeconomic variables using the bounds test approach of cointegration. In addition, this study enhances the literature on government expenditure and inflation rate in Nigeria by varying the period of study covered, the methodology adopted for this study, variables employed as well as the frequency of data amongst other factors. This will assist in validating previous findings as well as give rise to new matters on

the issue for further research. This paper is prepared as follows: literature review, methodology, discussion of results, conclusion and recommendations.

2. LITERATURE REVIEW

In previous decades, economists from various schools of thought have developed numerous theories on public expenditure. In this section, we shall be examining but a few.

2.1 THEORETICAL LITERATURE

2.1.1 THE CLASSICAL THEORY OF PUBLIC EXPENDITURE

This school of thought opined that in any country, for the most part, the private sector ought to perform economic activities because the involvement of government in an economy does more damage than good. Adam Smith's "Wealth of Nations" was of the view that the government should address defense against external hostilities, retain intramural peace and stability, community expansion work and provide enabling environments for businesses to strive. These activities cannot be sufficiently made available by private corporations owing to their extreme risk which is astronomical and insolvent (Jibir & Aluthge, 2019). The classical enunciated that a rise in aggregate cash level results in proportional changes in costs within the same direction, with the distribution of inputs unaffected.

2.1.2 KEYNESIAN APPROACH TO PUBLIC EXPENDITURE

Following the Great Depression between 1929 -1932, classical economists contended that strong trade unions were responsible for the high unemployment rate as they thwarted wages flexibility. However, Keynesians advocated for government involvement to fix the failures of the market. Keynes panned the classical economists for excessively highlighting the long-run period. He maintained that the production of commodities and employment of labor was extremely beneath their budding level owing to inadequate aggregate demand (Onuchuku & Adoghor, 2000). A rise in aggregate demand would enlarge productivity and employment opportunities, reverting the economy to a full employment level. Keynes asserted that with an expansionary fiscal policy, this is possible. He advocated for a budget deficit; government should cut taxes and increase expenditure rather than harmonizing the government budget. In his view, as government increase its spending levels, it would directly increase aggregate demand. In addition, lowering taxes increases households' disposable incomes.

2.1.3 WAGNER'S APPROACH TO PUBLIC EXPENDITURE

Adolph Wagner developed the law of increasing state activity after an experiential study of Western Europe in the last part of the 19th century. He made a case that the progress of government relies on improved industrialization and economic advancement. The reason is that in the course of industrialization, the nation's real per capita earnings rise, and part of its government spending in aggregate expenditure surges. According to this theory, the dawn of contemporary industrial civilization would cause escalating governmental stress for communal

advancement as well as increase the margin for societal deliberation. The major parts where government need to raise its spending according to Wagner include: First, in the course of industrialization, the dominance of public acts by private acts; an upsurge in state-owned protective and administrative obligations. The second is the establishment of social welfare facilities. Third, improved industrialization will cause scientific transformation and well-built corporations will tend to monopolize. These effects will be offset by the government through the provision of social and merit goods via budgetary means (Kuckuck, 2014).

2.1.4 PEACOCK AND WISEMAN APPROACH TO PUBLIC EXPENDITURE

Novel research on the basis of Wagner law was carried out by Peacock and Wiseman. The public expenditure in the UK for the period of 1891 to 1955 was examined by these scholars. In their view, incidents in the growth of public expenditure did not support Wagner’s theory. There might exist divergences in contemplations concerning appropriate public costs as well as a controlled tax system although these are able to be restricted by strives that are all-encompassing, for instance, warfare; Peacock and Wiseman opined that these strives will bring about a displacement effect, moving government revenue and expenditure to another height. Also, they expounded that there is no tendency in the composition of public expenditure, however, growths occur in strides or jolts. The displacement, inspection and concentration effects were employed in clarifying their postulation. The displacement effect comes about as soon as government revenue is deficient and there is an upward review of the tax system to augment income directed to the social disturbance, shifting revenue and expenditure to improved heights. Principally, residents have the inclination to initiate displeasure, although sooner or later, they are left with no option than accepting the state of affairs, generating a new cheek-by-jowl tax broadmindedness. As soon as the economy restores, in the absence of no recent disturbances, the incentive to revert to the erstwhile tax cut is non-existent. The revenue gotten by the recently formed tax is utilized in elevated echelons of public expenditure by an understanding general public; this process is the inspection effect (Olowofeso, Ankoma-Forkuo, Zirra, Falade & Nsonwu 2020). This difference in growth known as the concentration effect is seen by Peacock and Wiseman as the aeon of displacement and economic growth.

2.2. EMPIRICAL LITERATURE

The table below shows a summary of the reviewed empirical literature

Table 2: Summary of Reviewed Empirical Literature

Authors & Title	Scope	Objective	Methodology	Findings
Ezirim, Muoghalu & Elike. (2008). Inflation versus Public Expenditure in the US: An	United States of America; 1970 – 2002	Assess the long-run relationship between public expenditure and inflation	Johansen co-integration and Granger Causality test	Public expenditure and inflation are co-integrated. Also, the association between the variables is bi-causal.

Empirical Analysis.				
Magazzino (2011). The Nexus between Public Expenditure and Inflation in the Mediterranean Countries	Mediterranean countries; 1970-2009.	Examine the connection between public expenditure and the inflation rate	Unit Root and Granger Causality test	In Cyprus, France, Greece, and Portugal, inflation and public expenditure are co-integrated. For Cyprus, France, and Spain, there is a directional movement from inflation to expenditure; for Italy, Malta, and Portugal, there is a bidirectional movement.
Muhammad & Attiya (2013). Inflation, Economic Growth and Government Expenditure of Pakistan: 1980-2010	Pakistan; 1980 – 2010	Explore the connexion between the rate of inflation, economic growth and government expenditure	ARDL, Johansen co-integration and Granger-causality	Co-integration exists among the inflation rate, economic growth, and government expenditure; in the short run, the inflation rate has no impact on economic growth, but government expenditure does. Furthermore, both the inflation rate and government expenditure granger cause economic growth in Pakistan.
Olayungbo (2013). Government Spending and Inflation in Nigeria: An Asymmetry Causality Test	Nigeria; 1970 – 2010	Examine an asymmetry causal link between government expenditure and inflation	Granger Causality test and Vector Autoregression (VAR) modelling techniques	The causality from negative contractionary government expenditure to positive inflation changes is unidirectional
Ogbonna (2014). Inflation Dynamics and Government Size in Nigeria	Nigeria; 1981 – 2013	Assess the link between government size and developments in the consumer price index	Johansen co-integration test and VECM	(i) Nigerian government size and the consumer price index are co-integrated. (ii) In Nigeria, there was no long-term correlation between the consumer price index and government expenditure. (iii) There is no causality between Nigeria's consumer price index and government expenditure. Moreover, changes in the consumer price index in Nigeria depend on expectations for inflation and the exchange rate of the local currency.
Ogbole & Momodu (2015). Government Expenditure and Inflation Rate in Nigeria: An Empirical Analyses of Pairwise Causal Relationship.	Nigeria; 1970 – 2011	Investigate the description and scope of causal relationship between government expenditure and inflation rate	Descriptive and inferential analysis.	Government expenditure and inflation are stationary, inversely correlated, and co-integrated. Yet, they did not have a pairwise causal relationship with one another.

Ojarikre, Ezie, & Torka (2015). Public expenditure growth and inflation in Nigeria: The causality approach.	Nigeria; 1981 – 2012	Examine the causal association between public expenditure growth and inflation	Johansen Co-integration and Granger Causality test	The variables are not co-integrated. Also, there is no statistical relationship between government expenditure and inflation in Nigeria.
Mehrraraa, Soufianib, & Rezaei (2016). The Effect of Government Spending on Inflation through the STR Approach	Quarterly data; 1990 – 2013.	Scrutinize the nonlinear connexion between inflation and government spending.	Smooth Transition Regression Model.	When there is an insufficient rise in liquidity, government spending is not inflationary, has a low inflationary impact and probably stimulates economic growth. In an expansionary regime, a rise in money supply has added influence on inflation instead of production.
Dikeogu (2018). Public spending and inflation in Nigeria	Nigeria; 1980 - 2017.	X-rayed the impact of Nigeria's public spending on inflation	Descriptive statistics, Stationary test and ARDL modelling techniques.	Government capital and recurrent spending influence inflation negatively. Money supply has a positive influence on inflation while exchange rate has a positive effect on inflation.
George-Anokwuru & Ekpenyong (2020). Government Expenditure and Inflation in Nigeria.	Nigeria; 1999 - 2019.	Examine the effect of government spending on Nigeria's rate of inflation	Unit Root and ARDL test	Government spending and the inflation rate have a direct but insignificant relationship in the short run and an inverse and statistically insignificant relationship in the long run. Also, in the short run money supply and inflation rate have an insignificant and inverse relationship. There is an inverse relationship both in the short run and long run between GDP and inflation rate. Exchange rate has an inverse and significant relationship with inflation rate in the short run and a direct and significant relationship in the long run. Population is directly and statistically significant to inflation rate in both the short and long run. Lastly, investment has a direct but insignificant relationship with inflation rate but a significant and inverse relationship in the long run
Olowofeso et al. (2020). Symmetric and Asymmetric Effects of Inflation on	Nigeria; 1981 – 2018.	Examined the symmetric and asymmetric effects of Nigeria's inflation on	Linear and non-linear Auto Regressive Distributive Lag (ARDL) framework	Symmetric and asymmetric co-integration exist between inflation and government expenditure. Nigeria's inflation raised government expenditure. Furthermore,

Government Expenditure in Nigeria.		government expenditure		government expenditure brought to bear direct influences on economic output in both the short and long run.
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3. METHODOLOGY

This article utilized the quasi-experimental design and annual secondary times series data from 1970 – 2020 for the evaluation. Descriptive statistics, stationarity test, ARDL test plus stability test were utilized by the researcher in examining the connection between inflation, government expenditure, money supply and exchange rate. The data were obtained from the World Bank National Bureau of Statistics and the Central Bank of Nigeria.

3.1 MODEL SPECIFICATION

The variables adopted by the researcher were gotten from numerous works of literature reviewed. Thus, the model follows the assertion of Dikeogu (2018); George-Anokwuru and Ekpenyong (2020). This study explicitly assesses inflation and government expenditure in Nigeria. Based on the foregoing, the operational connexion between the variables is specified thus:

$$INFL = f(TGEX, MS, EXCR) \tag{3.1}$$

Stating equation 3.1 in linear form becomes

$$INFL = \alpha_0 + \alpha_1 TGEX + \alpha_2 MS + \alpha_3 EXCR \tag{3.2}$$

Where INFL = Inflation Rate; TGEX = Total Government Expenditure; MS = Money Supply; EXCR = Exchange Rate; $\alpha_0, \alpha_1, \alpha_2, \alpha_3$ = Parameter estimates and μ = Error term. It is anticipated that: $\alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0$

3.2 ESTIMATION TECHNIQUE

This paper applied the ARDL analysis method by Pesaran, Shin, and Smith (2001) to test the presence of a long-run relationship among the variables. The fundamental basis for taking up this method is the competence of this procedure in estimating short-run and long-run dynamical connections in minute sample sizes (Narayan & Smyth, 2005; Imoisi, 2022). Before evaluating the long-run relationship, a stationarity/unit root test was carried out on the variables. Consequently, the approximated ARDL is stated thus:

$$\begin{aligned} \Delta(INFL) = & \omega_1 + \sum_{i=1}^n \Phi_1 \Delta(INFL)_{t-1} + \sum_{i=1}^n \Phi_2 \Delta(TGEX)_{t-1} \\ & + \sum_{i=1}^n \Phi_3 \Delta(MS)_{t-1} + \sum_{i=1}^n \Phi_4 \Delta(EXCR)_{t-1} + \psi_1 INFL_{t-1} \\ & + \psi_2 TGEX_{t-1} + \psi_3 MS_{t-1} + \psi_4 EXCR_{t-1} + \mu_{t1} \end{aligned} \tag{3.3}$$

The variables are described in 3.2 and ω_1 is the constant, $\Phi_1 - \Phi_4$ represents the corresponding short-run coefficients, $\psi_1 - \psi_4$ represent the relevant long-run

coefficients, μ_t is the white-noise residuals, Δ signifies the difference, n is the lag length and t is the time. From equation 3.3 above, the estimators in the long-run were exposed to the F-test to detect if there exists co-integration among the variables. The calculated F-statistic was measured up with the critical values by Pesaran, Shin, and Smith (2001) to enable us to accept or reject the null hypothesis of no co-integration. The error correction model of equation 3.3 is specified in equation 3.4.

$$\Delta(INFL) = \hat{\omega}_1 + \sum_{i=1}^n \Phi_1 \Delta(INFL)_{t-1} + \sum_{i=1}^n \Phi_2 \Delta(TGEX)_{t-1} + \sum_{i=1}^n \Phi_3 \Delta(MS)_{t-1} + \sum_{i=1}^n \Phi_4 \Delta(EXCR)_{t-1} + \psi_1 ECM_{t-1} + \mu_t \tag{3.4}$$

The error-correction model is lagged once (ECM_{t-1}) and gotten from the estimated co-integrated equation. The lagged error correction model ψ_1 is expected to have a negative value and statistically significant, denoting the speed of adjustment to equilibrium after a macroeconomic shock to the system.

4. RESULT ANALYSIS AND INTERPRETATION

4.1 TREND ANALYSIS OF THE VARIABLES IN THE MODEL

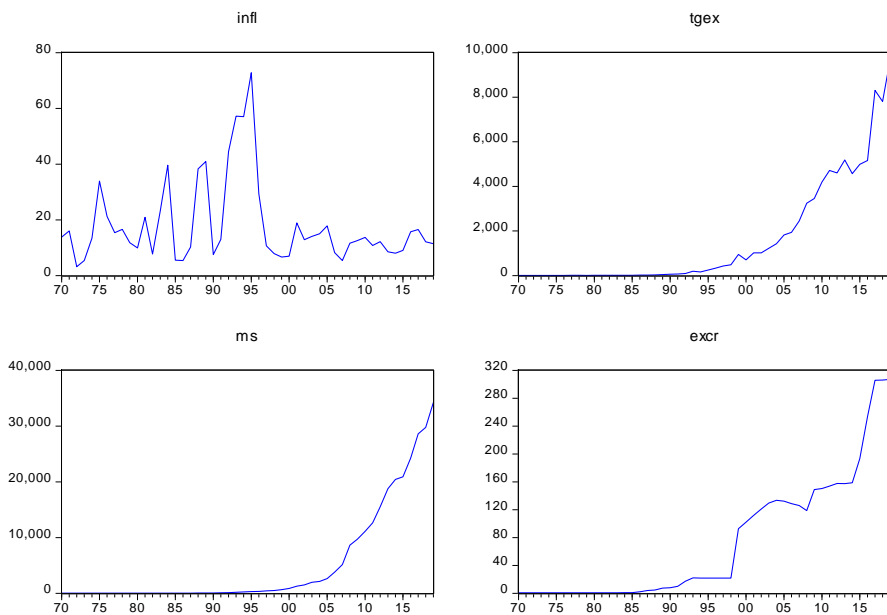


Figure 2. Trends of Inflation Rate, Government Expenditure, Money Supply and Exchange Rate from 1970 – 2020

The graphs above depict the data for Inflation rate (INFL), Total Government Expenditure (TGEX), Money Supply (MS) and Exchange rate (EXCR) from 1970 - 2020. It can be observed that Nigeria’s inflation rate fluctuated for the period under review. For instance, it was 13.76% in 1970 with an annual change of 3.60%; it rose to 21.71% in 1978 with an annual change of 6.62% and later reduced

to 5.72% in 1986, the period when the Structural Adjustment Programme was implemented by the Nigeria government with an annual change of -1.72%. It rose to a peak of 72.84% in 1995 with an annual change of 15.80% and fell again to 6.93% in 2000 with an annual change of 0.31%. It was inclined to reduce across 2001 - 2020 winding up at 13.2 % in 2020.

Government expenditure in Nigeria for the period under study is typified by an incessant increase. On average, between 1960 and 1970, government expenditure was ₦314.41 billion but between 1971 and 1980, it rose to ₦5972.90 billion signifying 1799.7% increase. On average, between 1981 and 1985, it was ₦11,188.42 billion indicating 87.3% rise (CBN, 2017). Government outlay sustained a continuous and upwards trend from 1986 to 1991. There was a 10% increase in aggregate government spending of ₦11,413.7 billion to ₦66,584.4 billion from 1986 to 1990 (CBN, 2017). However, government expenditure decreased from ₦191,228.90 billion to ₦160,893.20 billion from 1993 to 1994 denoting a -15.9% growth rate in government expenditure. Finally, from 2000 to 2020, it persistently rose, for instance, it increased massively from ₦701,059.40 billion to ₦4,813,380.00 billion from 2000 to 2016.

It can be seen from fig 2 above that from 1970 - 1985 exchange rate was relatively stable with its highest exchange rate value of 0.8938. In 1973, there was a change in the local currency (Nigerian pound to Naira) and its value with the American dollar was N0.65/US. This period was characterized by a pegged arrangement. However, in 1986, the flexible exchange rate was adopted by the nation via the framework of the Structural Adjustment Programme. In 1987, in spite of the flexible exchange rate, the naira reduced greatly from a yearly average rate of ₦17.30/US\$1 in 1992 to ₦22.05/US\$1 in 1993. Additionally, the naira US dollar exchange rate was pegged at ₦21.89/US\$1 between 1994 and 1998. This was a result of the CBN controlling excessive demand through the launch of the Dutch Auction System in 1990. In 1999, after the return to democracy, there was an erratic upsurge in the depreciation of the exchange rate; it rose from ₦21.89 in 1998 to ₦92.69 in 1999 and later to ₦133.5 in 2004. However, the naira appreciated against the US dollar from ₦132.15/US\$1 in 2005 to ₦118.57/US\$1 in 2008. Though the trend later changed with a depreciation of the naira at ₦148.88 in 2009 and ₦358.8 in 2020.

Money supply in Nigeria averaged about 33% from 1970 to 1980 and 13% from 1981 to 1989 while the rate of inflation was 19% and 16% respectively. In 1990, the money supply was 32.70% while the inflation rate reduced to 9.29%. A rise in inflation was witnessed in the early 1990s with an unprecedented figure in 1995. Similarly, there was a rising trend in the growth of money supply with 37.38%, 63.26%, 53.75% 34.49% and 19.41% for 1991, 1992, 1993, 1994, and 1995, respectively. Negative inflation rate was in 1998, 2001, 2004 and 2009 with values -5.66%, -0.32%, - 0.15%, -4.32% respectively. Furthermore, the years 2000, 2002, 2005, 2010 experienced positive inflation rate with values 35.22%, 39.89%, 22.02%, 103.82% respectively. In the meantime, money supply annual growth fluctuated

around double-digit; 22.31% in 1998, 48.06% in 2000, 20.67% in 2004, 13.22% in 2013, just in 2010 the annual growth rate of the money supply was 6.81%.

4.2 DESCRIPTIVE STATISTICS ANALYSIS OF VARIABLES

Table 3 below provides the descriptive analysis of the variables employed in the study.

Table 3. *Descriptive Statistics Analysis of Variables*

	INFL	TGEX	MS	EXCR
Mean	18.00002	1615.746	5137.370	73.66171
Median	12.94143	220.0000	259.6919	21.88610
Maximum	72.80000	9714.840	34251.70	306.9206
Minimum	3.200000	0.900000	0.789558	0.546358
Std. Dev.	14.97514	2463.305	9152.354	90.67951
Skewness	1.929049	1.652670	1.810251	1.120707
Kurtosis	6.294941	4.924785	5.078194	3.384134
Jarque-Bera	53.62825	30.47931	36.30608	10.77394
Probability	0.000000	0.000000	0.000000	0.004576
Sum	900.0011	80787.29	256868.5	3683.085
Sum Sq. Dev.	10988.48	2.97E+08	4.10E+09	402915.9
Observations	50	50	50	50

Source: Researchers' computation 2022

The idiosyncratic features of the variables have to be comprehended prior to proceeding to the econometric methods. Therefore, the data were examined to divulge their statistical properties and thus act as a guide for suitable modelling techniques to be accepted for assessing the relationships. In Table 3 above, the descriptive analyses of the series showed that the average value of INFL is 18%; average value of TGEX is ₦ 1,615.746 billion, average value of MS is ₦ 5,137.370 billion and average value of EXCR is ₦ 73.66171 to \$1 between 1970 – 2020. Further analyses suggested the series are positively skewed denoting that they have a long right tail; the kurtosis of the variables is leptokurtic. MS was the most volatile with a standard deviation value of 9152.35 while INFL was the least volatile with a standard value of 14.98. Furthermore, the Jarque-Bera tests shows that the null hypothesis is rejected for INFL, TGEX, MS and EXCR. On the basis of these analyses, it thus signifies that the series has unit root. Hence, assessing these variables at this level may not provide suitable outcome, consequently, there is a necessity to perform a unit root test to check if the variables were stationary or not.

4.3 UNIT ROOT TEST RESULTS

The ADF results in table 4 reveal that the variables are of a different order, respectively. Consequently, this study rejects the null hypothesis at the 5% level of significance. The combination of different order of the variables would not be plausible under the Johansen cointegration technique, as a result, we are justified to perform an ARDL test or bounds test on the variables (Salisu, 2016).

Table 4. Unit Root Test Result

Variables	ADF – statistics	Critical values		Order of Integration
LINFL	-4.721104	1% level	-3.574446	I(0)
		5% level	-2.923780	
		10% level	-	
		2.599925		
LTGEX	-8.059373	1% level	-3.574446	I(1)
		5% level	-2.923780	
		10% level	-	
		2.599925		
LMS	-4.293526	1% level	-3.574446	I(1)
		5% level	-2.923780	
		10% level	-	
		2.599925		
LEXCR	-5.600235	1% level	-3.574446	I(1)
		5% level	-2.923780	
		10% level	-	
		2.599925		

Source: Researchers' computation 2022

With the time series properties of the data established, the long run relationship between the variables is next to be evaluated. Nonetheless, selecting an appropriate lag length is a decisive factor before advancing to the co-integration test. Lag 2 in table 3 is regarded as appropriate and it is used in the computation of the F-statistics for co-integration.

Table 5. Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-225.16001	NA	1065205	14.50956	14.88649	13.56833
1	- 196.54932	78.02368	58859.68	11.32584	11.56849	11.40955
2	- 193.8645*	5.806309*	40582.89*	11.14085*	11.42019*	11.23950*
3	-193.8640	0.000408	42509.60	11.20659	11.53343	11.31118
4	-192.0463	1.849526	442555.21	11.22532	11.82118	11.34584
5	-190.9884	2.802831	42366.81	11.25944	11.81002	11.38292
6	-199.8554	0.808139	442690.40	11.21260	12.80187	11.36201

Source: Researchers' computation 2022

4.4 ARDL BOUNDS CO-INTEGRATION TEST

The ARDL bounds co-integration test results is presented in table 5. It helps determine whether the variables have a long run relationship.

Table 6. ARDL Bounds Co-integration Test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.722615	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89

	1%	4.29	5.61
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Source: Researchers' computation 2022

It can be seen from table 5 that 4.722615 is greater than 4.35 at 5% level of significance employing the unrestricted intercept. Consequently, the study rejects the null hypothesis of no co-integration, implying the presence of a long-run relationship between inflation, government expenditure, money supply and exchange rate.

4.5. LONG-RUN AND SHORT-RUN ESTIMATES

The long run and short run estimates are shown in table 6 below.

Table 7. Long-Run and Short-Run Estimates

Panel A: Long-run coefficients (dependent variable is INFL)			
Regressors	Coefficient	T-statistic	P-value
Constant	0.670862	1.357278	0.1821
Government Expenditure	-0.746276	-1.719903	0.0930
Money Supply	3.637569	4.056778	0.0002
Exchange Rate	0.435671	1.277009	0.2088
Panel B: Short-run results (dependent variable ΔINFL)			
Regressors	Coefficient	T-statistic	P-value
Constant	0.447539	2.091493	0.0427
Δ Government Expenditure	-0.524054	2.184902	0.0347
Δ Money Supply	2.526458	5.417749	0.0000
Δ Exchange Rate	1.546782	1.442515	0.1568
ECM _{t-1}	-0.377901	-4.502520	0.0001
R² = 0.486839		Adjusted R ² = 0.440187	
F – statistic = 10.43575		Prob (F statistic) = 0.000005	

Source: Researchers' computation 2022

The result shown in table 6 expose that government expenditure does not conform to the apriori expectation; it is negative and insignificant, notwithstanding the period. A unit rise in government expenditure results in a 0.75 unit decrease in inflation in the long run and a 0.52 unit decrease in inflation in the short run. It is likely to interpret these findings as thus; that government expenditure in Nigeria does not lead to inflationary pressure in the short-run and long-run as an upsurge in total government spending led to a growth in the overall output as aggregate quantity demanded is pushed back to equilibrium owing to producers' expansion in their total output. Therefore, allocating additional resources for government expenditure should not to be seen as inflationary since it will promote the growth of the Nigerian economy.

This inverse relationship between inflation and government expenditure as shown from the result is supported by the findings of Dikeogu (2018) who found a negative correlation between government expenditure (capital and recurrent) and inflation in Nigeria. Also, our findings which reveals that government spending does not play a key role in causing inflation in Nigeria, in the long-run or in the short-run

is supported by the findings of Mehrara & Sujoudi (2015) who discovered that government spending had no significant effect on inflation rate in Iran.

In addition, money supply is positive and statistically significant in the long run and short run. A unit rise in money supply leads to a 3.64 unit rise in inflation during the long run and a 2.53 unit rise in inflation during the short run. These results suggest that the money supply performs a key function in the inflation rate in Nigeria irrespective of the period. This result is supported by the findings of Arikawe (2002), Obadan (2010), Oladapo and Akinbobola (2011), Immoles and Enoma (2011) who were of the opinion that growth in money supply results in a surge in inflation.

Lastly, exchange rate was positive and insignificant notwithstanding the period. A unit rise in the exchange rate causes a 0.44 unit rise in inflation in the long run and a 1.55 unit rise in inflation in the short run. This result is reinforced by the findings of Abdullahi and Kime (2016) who discovered a positive relationship between exchange rate and inflation in Nigeria from 1980 – 2012.

The ECM coefficient from the result is -0.377901 and with a P value of 0.0001 is significant. This denotes that the adjustment speed between the short run dynamics and the long run equilibrium is 37.79% in absolute terms. The $R^2 = 0.486839$ implies that approximately 49% of the variation in inflation is explained by the variation in government expenditure, money supply and exchange rate while 51% of the variation in inflation is due to other factors not captured in the model. The F – statistics of 10.43575, with p value of 0.000005 indicates that the overall model is statistically significant.

4.6 RESIDUAL DIAGNOSTIC RESULT

In order to guarantee the robustness of the estimates, several diagnostic tests were carried out. These include the Serial Correlation test, Heteroscedasticity test and Normality. Table 8 below exposes these results from the diagnostic tests.

Table 8. Diagnostic Test Result

Test	Statistics	P value
Heteroskedasticity	0.708143	0.4051
Serial Correlation	1.088302	0.3884
Normality	3.934151	0.139865

Source: Researchers' computation 2022

From the above table, the coefficient of the Breusch-Godfrey Serial Correlation LM Test statistically confirms the absence of serial correlation at 5% level of significance. Also, the probability value of the heteroscedasticity test illustrates that it is homoscedastic for each outcome of the estimated equations. Lastly, the probability value of Jarque-Bera shows that the residuals are normally distributed.

4.7 STABILITY TESTS

In order to perform the stability test, the cumulative sum (CUSUM) is employed. A graphical representation of CUSUM is portrayed in fig 3 below.

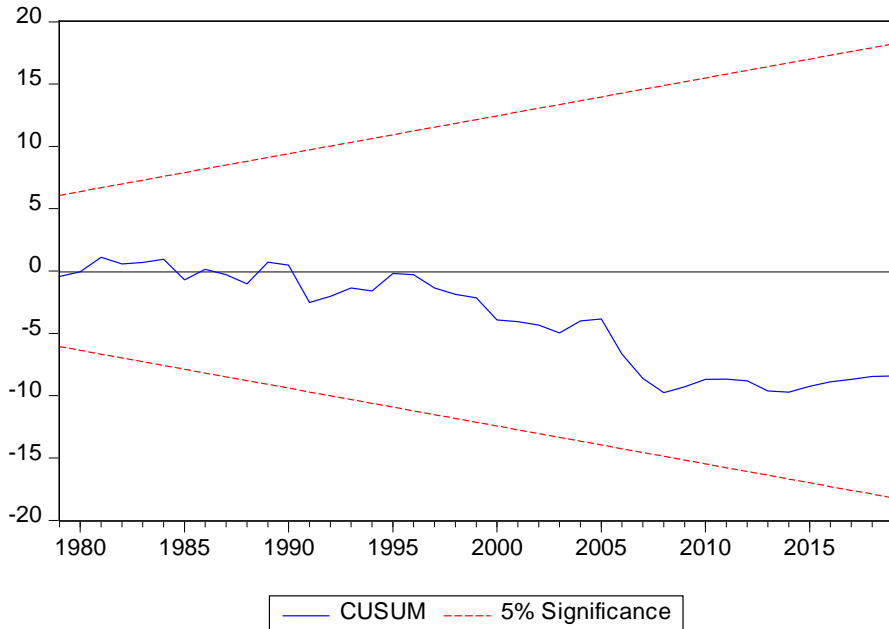


Figure 3. Graphical Representation of the Cumulative Sum (CUSUM)
 Source: Researchers' computation 2022 using E-views10

In the Figure above, the cumulative sum (CUSUM) test is revealed and it indicates no structural instability in the residuals of the equation which describes the changing aspects of inflation regarding government expenditure, money supply and exchange rate. Furthermore, figure 3 illustrates that the plot of the CUSUM varies within the 5% critical bounds. Consequently, the estimated coefficients are stable from 1970 to 2020.

5. CONCLUSION AND RECOMMENDATION

This article looked at the relationship between government expenditure and the rate of inflation in Nigeria from 1970 - 2020 by making use of the ARDL method to unearth the long-run equilibrium relationship. Money supply and exchange rate were added to government expenditure to create a multivariate framework. The result of the ARDL test divulges the existence of a long-run relationship between government expenditure, money supply, exchange rate and inflation rate. The coefficient of government expenditure is negative and statistically insignificant in the short and long run, inferring that a rise in government expenditure decreases the inflation rate. However, it was realized that the money supply was positive and significant regardless of the period and thus had an effect on the inflation rate, while the exchange rate was positive and statistically insignificant. The outcomes from this paper offer macroeconomic policymakers an enhanced insight into the significance of effective government expenditure on projects or amenities that can cut down production cost and hence, boost the total output of the economy. This is because when government expenditure is well-organized in an economy, it tends to be non-

inflationary. Also, the Central Bank of Nigeria, which is the apex monetary authority in the country has not efficiently managed the total money supply in the economy, thus, causing inflation. Based on these, it was recommended that: Government have to enhance its expenditure on productive and fecund activities that will increase the total output of the economy as this tends to reduce the rate of inflation in the economy rather than exacerbate it. Also, the Central Bank of Nigeria ought to unceasingly moderate the increase in money supply because of its capacity of exerting unnecessary inflationary pressures on the Nigerian economy.

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