

Public expenditure and inflation rate in Nigeria: An empirical analysis

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World Journal of Advanced Research and Reviews, 2022, 16(03), 411–418

Publication history: Received on 02 November 2022; revised on 10 December 2022; accepted on 12 December 2022

Article DOI: <https://doi.org/10.30574/wjarr.2022.16.3.1049>

Abstract

The study investigated the impact of public expenditure on inflation rate in Nigeria. Time series data spanning from 1981 to 2021 was sourced from the Central Bank of Nigeria statistical bulletin. The ARDL bounds testing approach to co-integration was used to analyse the data. Autoregressive Distributed Lag (ARDL) model and Error Correction Model (ECM) were utilized to address the main objectives of the study. The estimated short run coefficient result revealed that one period lag of CAP has a negative and insignificant impact on inflation rate. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 19.7 percent as shown by the coefficient of ECM. The long run result showed that capital expenditure has no impact on inflation rate while recurrent expenditure has a positive and significant impact on inflation rate. The result also showed that debt servicing has a positive and insignificant impact on inflation rate. Based on these findings, the study recommended that government should reduce its rate of borrowing and also ensure that borrowed funds and greater part of its expenditures are strictly channeled to productive ventures that are capable of transforming the economy.

Keywords: Inflation rate; Capital expenditure; Recurrent expenditure; Debt servicing

1. Introduction

Public expenditure involves all the expenses which the public sector incurs for its maintenance, for the benefit of the economy, external bodies and for other countries [4]. According to [7] government expenditure is the expenses of the government for its own maintenance and on the society and the economy as a whole while [14] opined that public expenditure refers to all expenditures, both recurrent and capital expenditures which the government incurs in the course of performing its functions. Government expenditures include both recurrent expenses and capital expenses. [10]. [16] see government expenditure as money spent by the government of any nation in carrying out its constitutional responsibilities of providing social amenities for its citizenry and protecting its territorial integrity.

1.1. Statement of problem

In Nigeria, the rate of inflation has increased continuously over the years. For instance, inflation rate increased from 6.9 % in 1982 to 23% in 1991. It also increased from 11.9 % in 1998 to 13.9 % in 2009 and also increased further to 15.6 % in 2021. Evidence from records also showed that government expenditures also increased continuously within the given period of time. For instance capital expenditure increased from N6.42 billion 1982 to N28.34 billion in 1991 while recurrent expenditure increased from N5.51 billion in 1982 to N38.24 billion 1991. The record also showed that capital expenditure increased from N309.02 billion in 1998 to N1152.8 billion in 2009 and also increased further to N2522.50 billion while recurrent expenditure increased from N178.1 billion in 1998 to N2127.97 billion in 2009 and also further increased to N7593.16 billion in 2021 [6]. Empirical works do not have a uniform outcome on the effect of government spending on the rate of inflation. For instance, [9] concludes that both capital expenditures and recurrent expenditures have a negative relationship on inflation while [17] conclude that government capital spending has a negative effect on

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inflation while recurrent spending has no effect on inflation but [11] conclude that there exist a positive relationship between government expenditure and inflation. Given that there is no uniform outcome on the impact of government expenditure on inflation rate, the study therefore investigated the impact of public expenditure on inflation rate in Nigeria.

1.2. Objectives of the study

The broad objective of the study was to investigate the impact of public expenditure on inflation rate in Nigeria. The specific objectives of the study were:

- To examine the impact of capital expenditure on inflation rate in Nigeria.
- To investigate the impact of recurrent expenditure on inflation rate in Nigeria.
- To explore the impact of debt servicing on inflation rate in Nigeria.

1.3. Hypothesis of the study

In order to guide the study, the following null hypotheses were formulated:

- HO1: Capital expenditure does not have any impact on inflation rate in Nigeria.
- HO2: Recurrent expenditure does not have any impact on inflation rate in Nigeria.
- HO3: Debt servicing does not have any impact on inflation rate in Nigeria.

2. Literature review

2.1. Theoretical Framework

2.1.1. Keynesian theory of demand-pull inflation

Demand -pull inflation represents a situation where the basic factor at work is the increase in aggregate demand for output either from the government or the entrepreneurs or the households. The result is that the pressure of demand is such that it cannot be met by the currently available supply of output. Keynes explained that inflation arises when there occurs an inflationary gap in the economy which comes to exist when aggregate demand exceeds aggregate supply at full employment level of output. Basically, inflation is caused by a situation whereby the pressure of aggregate demand for goods and services exceeds the available supply of output. In such a situation, the rise in price level is the natural consequence [1].

2.1.2. Monetarist theory of inflation

The monetarist explained the emergence of excess demand and the resultant rise in prices on account of the increase in money supply than in output. Friedman holds when money supply is increased in the economy, then there emerges an excess supply of real money balances with the public over the demand for money. This disturbs the equilibrium. In order to restore the equilibrium, the public will reduce their money balances by increasing expenditure on goods and services. The excess supply of real monetary balances results in the increase in aggregate demand for goods and services. If there is no proportionate increase in output, then extra money supply leads to excess demand for goods and services. This causes inflation or rise in prices [1].

2.2. Conceptual literature

Public expenditure is the expenses or cost that government usually incurs for maintenance of itself as an institution, the economy and the society [13] as cited in [15]. Public expenditure involves all the expenses which the public sector incurs for its maintenance, for the benefit of the economy, external bodies and for other countries [4]. [5] defined public expenditure as the expenses which a government incurs for its own maintenance the society and the economy and helping other countries. [7] opined that public expenditure is structured into two major categories which make for easy accounting and efficient fiscal management. The two categories of public expenditure are recurrent expenditure and capital expenditure. Recurrent expenditures are expenditures that occur regularly throughout the year. They must be made regularly if the functions of government must be maintained. They include regular salaries of all employees, money spent on the running of essential services or regular maintenance of infrastructural facilities and money spent on administration. Capital expenditures are all the expenditures on capital projects such as buildings, construction of

roads, bridges and all permanent structures and assets. These usually involve large sums of money and also form the basis of the physical development of a nation.

According to [7], there are principles that also govern the public expenditure decision. They include: (i) canon of sanction which advocates that public fund can only be used by proper authorization and for the purpose for which it approved. In a democratic set up, it is the legislature that sanctions the expenditure on demand by the executive authorities. The rationale is that such a restriction would avoid unscrupulous and unwanted expenditure and it will observe as a check against misappropriation of public funds. (ii) canon of economy which suggests that necessary care must be taken to avoid wasteful usage of public funds. The process of public expenditure should not involve the use of resources more than what are just necessary. (iii) canon of benefit which suggests that expenditure is to incurred only if it is beneficial to the society. Expenditure is therefore judged by the benefit that will accrue from it. (iv) canon of surplus which emphasizes on the fact that government should avoid deficit budgeting at least for the greater part of the time, that is, persistent one. Government should be prudent and try to meet its current expenditure from current revenue. Government should not spend beyond its available resources into a debt.

Public expenditures have some effect on the economy and they include: making for economic stabilization. As income, employment and prices always experience fluctuations in the economy in terms of depression and boom from time. During periods of depression, there is the need for a continuous injection of additional purchasing power in the market when the economy is experiencing depression by stimulating investment and consumption activities and through direct public investment which a part of public expenditure as such a government expenditures will be meant to directly add to the effective demand in the market and generate a high value multiplier effect in the economy but during periods of boom, there is a reduction in government expenditure while the rate of taxation can be increased slightly or leaving at the same rate (ii) the level of development in economic activities can be accelerated through public expenditure thereby leading to higher levels of production and growth (iii) public expenditure can be used to create human skills through education and training. The federal government has developed infrastructures like classroom blocks, laboratories, libraries, computer centers in many tertiary institutions through the education tax fund public expenditure aids the development of basic infrastructures [7].

A situation is described as inflationary when either the prices or supply of money are rising, because in practice both will rise together. In the Keynesian sense, true inflation begins when the elasticity of supply of output in response to increase in money supply has fallen to zero or when output is unresponsive to changes in money supply. When there exist a state of full employment the conditions will be clearly inflationary if there is increase in the supply of money. But since the classical view that there is full employment is not subscribed, it can be said that when money supply increases it results partly in the increase the increase of output and it partly feeds the rise in prices. And when the supply of output lags far behind, the rise in prices is described as inflationary [8]. Inflation means any persistent increase in the general price level which is non-seasonal in nature [10].

Different names has been given to inflation depending upon the rate of rise in prices.(i) creeping inflation is the type of inflation experienced when the rise in prices is very slow like that of a snail or creeper. In terms of speed, a sustained rise in prices of annual increase of less than 3 per cent per annum is characterized as creeping inflation. (ii) walking or trotting inflation is the type of inflation experienced when prices rise moderately and the annual inflation rate is a single digit. The rate of rise in prices is in the intermediate range of 3 to 7 percent or less than 10 percent (iii) running inflation is the type of inflation experienced when prices rise rapidly like the running of a horse at a rate of speed 10 to 20 percent annum (iv) hyperinflation is the type inflation that is experienced when prices rise very fast at double or triple digit rates from more than 20 percent to 100 percent per annum or more [12].

2.3. Empirical literature

[2] examined the effect of government expenditure on inflation rate in Nigeria within a period of 39 years spanning (1981-2019). The study specifically sought to ascertain the extent to which government expenditure on agriculture, government expenditure on education, government expenditure on health and government expenditure on telecommunications affected inflation rate in Nigeria. Data were collected from [6]. Government expenditure was broken into Government Expenditure on Agriculture (GOA), Government Expenditure on Education (GOE), Government Expenditure on Health (GOH) and Government Expenditure on Telecommunication (GOT) as the independent variables while inflation rate (INF) was the dependent variable. Multivariate regression based on Johansson Co-integration and Error Correction Model (ECM) were used to analyze the data. The findings of the study revealed that government expenditure on education has a positive and insignificant effect on the inflation rate. The study also revealed that government expenditure on agriculture and government expenditure on education have positive but insignificant effect on the inflation rate, while government expenditure on health and government expenditure on telecommunications

have positive and significant effect on inflation rate. The study recommended among others that government should increase the allocation to the health and education sectors to increase the skill and health of economic operators which will enhance productivity.

[3] Investigated the impact of Nigerian government expenditure (disaggregated into capital and recurrent) on economic growth using time series data for the period 1970-2019. The study employed Autoregressive Distributed Lag (ARDL) model. To ensure robustness of results, the study accounts for structural breaks in the unit root test and the co-integration analysis. The key findings of the study were that capital expenditure has positive and significant impact on economic growth both in the short run and long run while recurrent expenditure does not have significant impact on economic growth both in the short run and long run. The study recommended among others that government should increase the share of the capital expenditure especially on meaningful projects that have direct bearing on the citizen's welfare.

[17] Examined asymmetry causal relationship between government spending and inflation in Nigeria from the period of 1970 to 2010. Data used in the study were collected from [6]. The asymmetry causality test showed that a uni-directional causality exists from negative government expenditure changes (low or contractionary government spending) to positive inflation changes (high inflation) in the Vector Auto-regression (VAR) model. The findings of the study implied that inflationary pressure in Nigeria is state dependent, that is high inflation is caused by low or contractionary government spending.

[17] examined the relationship between monetary inflation and fiscal spending in Nigeria using time series data from 1981 to 2016. Following ex post facto research design, the study employed Least Squares (LS) technique in the estimation while line graph, normality test, correlation analysis were used in the preliminary analysis. Data for the study were collected from [6]. The findings of the study showed that government capital spending exerted a significant negative effect on monetary inflation in Nigeria; money supply exerted a significant positive effect on monetary inflation in Nigeria. However, government recurrent spending exerted no effect on monetary inflation in Nigeria. The result suggested that inflation do not grow with the growth in fiscal spending a result which implied that government fiscal spending has not reach a level that it can stimulate inflation and that, inflation is indeed monetary phenomena in the country. The recommended among others that government needed to discourage all non-productive expenditures since fiscal spending has been shown to be ineffective neither in raising aggregate demand nor stimulating inflation.

[9] examined the effect of public spending on inflation in Nigeria from 1980 to 2017. Data used in the study were sourced from [6] (various issues). The study used public capital (GCE) and recurrent (GRE) spending as the main explanatory variables while money supply (MSS) and exchange rate (EXR) were added as check variables. The Auto Regressive Distributed Lag (ARDL) was used to analyze the relationship between public spending and inflation in Nigeria. The result of the study showed that government capital spending impacts negatively on inflation; government recurrent spending has a negative and an insignificant impact on inflation. Also, money supply has both a positive and negative impact on inflation while exchange rate has a positive and an insignificant impact on inflation. Based on these findings, the study recommended that government needed to ensure appropriate channeling of its expenditure to infrastructural development in order to stimulate investment and production thereby stabilizing price.

3. Method

Multiple regression analysis was used in the study. Time series data spanning from 1981 to 2021 was sourced from [6]. The data were analysed using E-views 10.

3.1. Model specification

In order to investigate the impact of government expenditure on inflation rate in Nigeria, the model for the study was specified thus:

$$\text{INFL} = f(\text{CAP}, \text{REC}, \text{DBTS}) \dots (1)$$

Where:

INFL = Inflation rate
 CAP = Capital expenditure
 REC = Recurrent expenditure
 DBTS = Debt servicing

The model in its econometric linear form can be written as:

$$INFL = b_0 + b_1CAP + b_2REC + b_3DBTS + U \dots (2)$$

U = stochastic or random error term

b₀ = constant intercept

b₁ – b₃ = coefficients of associated variables

The model in the log linear form can be expressed as:

$$\text{LogINFL} = b_0 + b_1\text{LogCAP} + b_2\text{LogREC} + b_3\text{LogDBTS} + U \dots (3)$$

Where: Log = natural logarithm

The theoretical expectations about the signs of the coefficients of the parameters are as follows: b₁>0, b₂>0, b₃>0

Since the data for the analysis is time series, the Augmented Dickey-Fuller (ADF) unit root test was employed to ensure data stationarity and avoid the problem of spurious regression. The Augmented-Dickey Fuller (ADF) unit root test was employed to ensure data stationarity and avoid the problem of spurious regression since the data for the analysis is time series. Bound test was applied to determine the existence of long run equilibrium relationship among the variables

Table 1 Result of Augmented Dickey-Fuller unit root test

Variable	ADF test statistic	1% critical value	5% critical value	10% critical value	Order of integration
LOG(CAP)	-6.105199	-3.610453	-2.938987	-2.607932	1(1)
LOG(REC)	-8.358559	-3.610453	-2.938987	-2.607932	1(1)
LOG(DBTS)	-6.946570	-3.610453	-2.938987	-2.607932	1(1)
LOG(INFL)	-5.386894	-3.605593	-2.936942	-2.606857	1(0)

Source: Author’s computation using E-Views 10

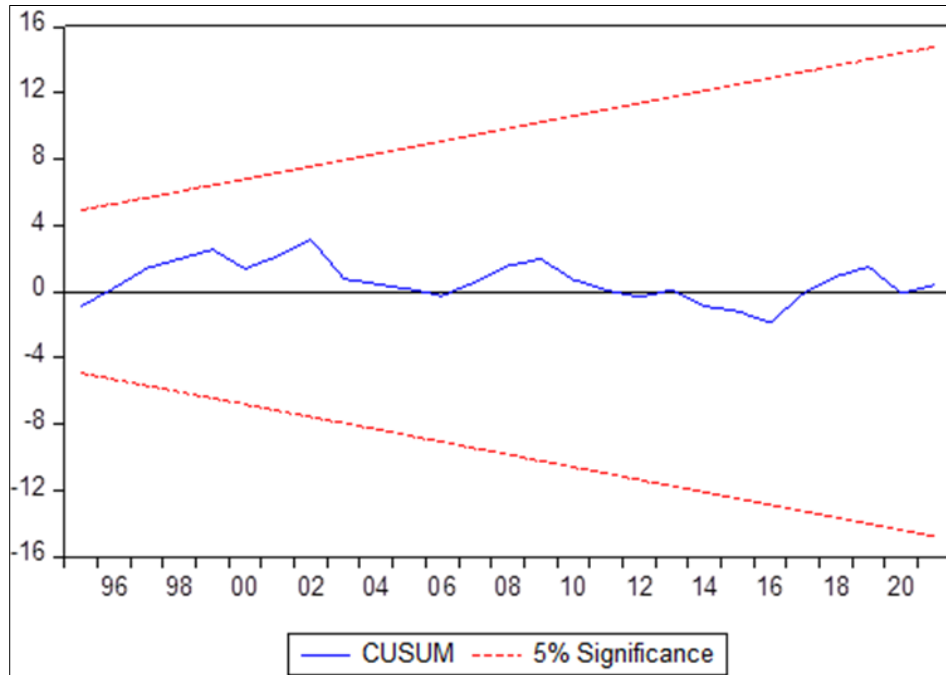
The unit test result presented on table 1 showed that LOG(CAP), LOG(REC) and LOG(DBTS) were stationary at first difference while LOG(INFL) was stationary at levels. This is because their various ADF test statistic were greater than their various 1%, 5% and 10% critical values in absolute terms.

Table 2 ARDL Bounds Test

Sample: 1981-2021		
Included observations: 37		
Null Hypothesis: No long run -relationships exist		
Test Statistic	Value	K
F-statistic	6.444662	3
Critical value bounds		
Significance	1(0) bound	1(1) bound
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.68

Source: Author’s computation using EViews 10

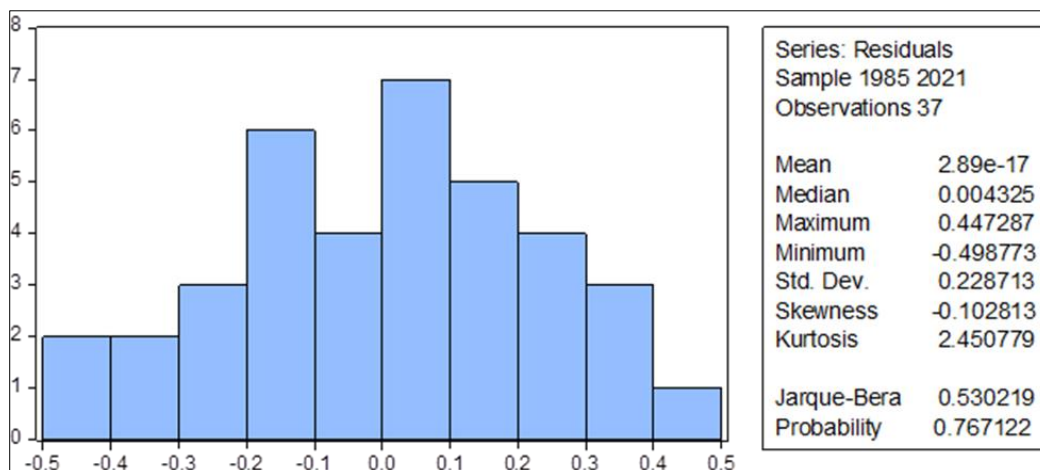
The unit test result showed that the data employed in the work is a combination of 1(0) and 1(1) meaning that the data set is a combination of stationarity and non-stationarity data as a result the applied Bound test to determine the existence of long run equilibrium relationship among the Variables. Table 2 shows that there is a presence of co-integrating relationship among the Variables in the model since the Null hypothesis of no long run relationship could not be accepted because the upper and lower Critical Value Bounds at all level of significance is less than the value of F-Statistic. This implies that LOG(INFL), LOG(CAP), LOG(REC) and LOG(DBTS) have a long run relationship. This justifies the need to estimate both short run and long run relationship among these variables in this study.



Source: Author’s computation using EViews 10

Figure 1 Structural stability test

To investigate the existence of a possible structural instability, the study used the Cusum test on figure 1 and found that the cumulative sum remained within the area between the two critical lines showing that test did not detect any systematic eventual movements and that the coefficients values reflect structural stability.



Source: Author’s computation using E-Views 10

Figure 2 Normality test

Figure 2 above, shows that there exists normal distribution of the residuals as the probability (0.530219) of Jaque-Bera statistics is greater than 5%. This is encouraging as it exposes that our OLS estimates are unbiased, t-statistics and confidence intervals are robust as well as prediction intervals.

Table 3 Estimated Short Run ARDL (2, 0, 0, 4) Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(CAP(-1))	-0.255942	0.138867	-1.843080	0.0763
DLOG(INFL)	-0.027011	0.035425	-0.762477	0.4524
DLOG(INFL(-1))	-0.177237	0.055950	-3.167792	0.0038
DLOG(INFL(-2))	-0.143215	0.045169	-3.170657	0.0038
DLOG(INFL(-3))	-0.058756	0.037229	-1.578230	0.1262
ECM(-1)*	-0.196681	0.032335	-6.082527	0.0000
R-squared	0.517175	Mean dependent var		0.173568
Adjusted R-squared	0.439300	S.D. dependent var		0.329152
S.E. of regression	0.246469	Akaike info criterion		0.184231
Sum squared resid	1.883154	Schwarz criterion		0.445461
Log likelihood	2.591722	Hannan-Quinn criter.		0.276327
Durbin-Watson stat	2.293618			

Source: Author's computation using E-Views 10

The estimated short run coefficient result as showed in table 3 revealed that one period lag of CAP has a negative and insignificant impact on inflation rate. The error correction model (ECM) showed that the speed of adjustments back to equilibrium in the estimated model is correctly sign and is significant. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 19.7 percent as shown by the coefficient of ECM. In another words, this implies that an approximately 19.7 percent of disequilibrium from the previous year's shock converge to the long-run equilibrium in the current year.

Table 4 Estimated Long Run Coefficient of ARDL (2, 0, 0, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(REC)	0.774073	0.132748	5.831144	0.0000
LOG(DBTS)	0.336219	0.323780	1.038419	0.3083
LOG(INFL)	1.369129	0.962717	1.422151	0.1664
C	-9.001596	7.837153	-1.148580	0.2608
EC = LOG(CAP) - (0.7741*LOG(REC) + 0.3362*LOG(DBTS) + 1.3691				
*LOG(INFL) -9.0016)				

Source: Author's computation using EViews 10

The estimated long run coefficient result in table 4 showed that capital expenditure (CAP) has no impact on inflation rate while recurrent expenditure (TEXP) has a positive and significant impact on inflation rate. The result also showed that debt servicing has a positive and insignificant impact on inflation rate. The result also showed that a percentage increase in recurrent expenditure will on the average bring about 77.4073 percent increase in inflation rate while a percent increase in debt servicing will on the average bring about 33.6219 percent increase in inflation rate.

4. Conclusion

The study examined the impact of government expenditure on inflation rate in Nigeria for the period 1981–2021. The estimated short run coefficient result revealed that one period lag of CAP has a negative and insignificant impact on inflation rate. The error correction model (ECM) which shows that the speed of adjustments back to equilibrium in the estimated model is correctly sign and is significant. The speed of adjustment for correcting disequilibrium from the previous year to equilibrium in current year is 19.7 percent. The long run result showed that capital expenditure (CAP) has no impact on inflation rate while recurrent expenditure (TEXP) has a positive and significant impact on inflation rate. The result also showed that debt servicing has a positive and insignificant impact on inflation rate.

Recommendations

Based on these findings, the study recommended that government should reduce its rate of borrowing because of the cost of such borrowing and also ensure that borrowed funds and all its expenditures should strictly be channeled to productive ventures that are capable of transforming the economy.

Compliance with ethical standards

Acknowledgments

The author of this article wishes to acknowledge all the authors whose works were consulted in preparing this article. The author also wishes to acknowledge the Central Bank of Nigeria from where the data used in this work were sourced.

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