



Government Expenditure and Economic Growth in Nigeria 1970-2022: ARDL APPROACH

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ABSTRACT:

The study examined the effect of public sector expenditure on economic growth in Nigeria for the period 1970-2022 based on data obtain from central bank annual bulletin and world bank and using auto regressive distributive Lag to determine the short run and long run effects of the variable of study. Kernel test was conducted for normality of distribution of data set. the test for stationarity of the data series was performed using two different methods namely, the Augmented Dickey Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure. While the ADF test is an indirect process of testing for unit roots, the KPSS tests are more direct in terms of the null hypothesis. Recurrent expenditure and total expenditure have significant positive long run impacts on gross domestic product in Nigeria, the effect of capital expenditure is insignificant. Long run effects of public expenditure on economic growth are generally different from the long run effects. It was recommended that government should increase spending in recurrent expenditure to boost economic growth

KEYWORDS:

Recurrent Expenditure. Capital Expenditure. Total Expenditure. Gross Domestic Product.



Introduction

Government spending is used as a tool for economic growth. It plays a pivotal role in the functioning of any economy at all stages of growth. Currently, many countries use public expenditure to effectively redistribute income, influence resources allocation and determine the components of national income (World Bank, 2008; Vtyurina, 2020). Governments play dual roles in generating revenue and channelling these income through expenditure to fulfil its obligations to the citizenry. The government is entrusted with the management of the economy for common good which include provision of infrastructure such as road, electricity, health care, and employment, reduction of poverty, reduction of income inequality and redistribution of wealth as well as security for the citizens and protection of the sovereignty of the nation against external aggression. No country economy is free from imperfection because market failures occur (Nguyen & Bui, 2022). These failures are ignited by forces of demand and supply, inefficiencies in the economic system, poor policy implementation and external influences. Based on the foregoing, it is imperative for governmental intervention through fiscal policies in the economic system to stem the tide of this anomaly and stabilize the economy. The government regulates the growth of the economy by shaping economic growth through intervention and policies which help to prevent economic crises and mitigate negative effects.

The link between government spending and economic growth has long been studied and debated. These debates are hinged on two perspectives. The conventional effective demand theory argues that government expenditure, as an external component can be utilized as a major policy tool to boost economic growth within the Keynesian theoretical framework. Contrastingly, Wagner's theoretical perspective enthused that government spending occurs from economic progress rather than being the cause of economic progress (Tran et al, 2022). The influence of government expenditure on growth still remains unclear in Nigeria. Public sector expenditure impact the economic, social and private life of the people as well as the quality of goods and services introduced to and enjoyed by the people. However, the question presently agitating the minds of scholars, citizens and even the government of various economies in the world is whether governmental spending achieve the necessary economic goal of development and growth whilst at the same time achieving other economic goals such as poverty reduction and redistribution of wealth for even development of various segments of the economy. The risk associated with government expenditure is that partly the expenditure goal may be ineffective unproductive and unachievable thereby energising critics that often ask questions about its effectiveness. It is a common scenario that government expenditure ends up in investments that prove to be unproductive thereby lending support to opponents of fiscal interventions in the economy such as Milton Friedman.

The issue of effectiveness and efficiency of governmental expenditure has attracted rigorous political and academic discourse globally amongst researchers and policy makers irrespective of level of economic growth a country has achieved.. In many sub-Saharan African countries, the comprehensive use of public spending as a fiscal policy tool and its impacts on economic growth are still questionable. Nigeria is currently experiencing economic downturn due to dwindling oil revenue which the country relies for its sustenance. Government continue to increase spending on infrastructure with a view toward economic growth to ease the burden of citizens. The problem is that the economic growth recorded has not translated into improved welfare. Therefore based on the conflicting results obtained from prior studies, non-agreement of theoretical postulations and the increasing need of economic growth in developing countries where expected growth does not match expenditure there is need for studies on the subject of economic growth and expenditure.

Literature Review

Theoretical Perspectives

Many theoretical propositions have been made to situate the significance of public spending as a correlation of economic growth in a country. However, these propositions are conflicting. Theoretical

propositions such as Richardson equivalence principle, classical economic theory, Wagner's law, and Keynesian theory and associated theories derived therefrom contributes to the raging debate in the literature of public sector expenditure. These conflicting theoretical propositions ignite debate and discussions on the subject of governmental spending and relevance to economic development and growth.

Classical economic theory advocates that forces of demand and supply is the unseen hand that guides economic activities and the markets operate efficiently when they are unregulated thus advocating minimal intervention by the government in economic activities (Palley, 2013; Chen, Singh, and Aru, 2022). Extending this theoretical proposition imply that government spending is an inefficient and unproductive effort in improving economic growth and development as it stifles and crowd out private investments leading to depression. Classical economic proposition therefore means that government spending and economic growth correlates negatively (Saunders, 1985; Miftari, Kida, & Shala, 2021).

Contrastingly, **Wagner's law** posits that public expenditure occur as a result of economic growth or development and thus is an outcome, not a cause, of growth. According to this theory, an economy develops over time, which leads to an increase in government activities, which, in turn, results in an increase in public spending

Keynesian theory argues that governments need to intervene in order to enhance economic growth by spending more on social programs and projects, as well as providing valuable public goods such as education, healthcare, and infrastructure to beneficiaries. Arguing further the Keynesians postulates that government spending creates multiplier effect thereby stimulating private spending whilst simultaneously and synergistically enhancing economic growth (Liu et al., 2020). Thus, increase spending's by government spins the economy out of depression

Conceptual Framework

Recurrent Expenditure: Recurrent expenditure refers to spendings on goods and services and is expenditure that does not acquire or create assets and infrastructure. Its main components are payment for services and for administrative purposes such wages, salaries, public debt charges or interests for both internal and external debts, pensions and gratuities.

Capital Expenditure: Capital expenditure refers to spending on assets and creation of infrastructures. It is the purchase of items and creation of items that will last and will be used time and time again in the provision of a good or service. Examples include construction of roads, classroom blocks, housing, electricity and water. It creates public utilities to the advantage of citizens.

Economic Growth

Economic growth refers to increase in quantity and quality of economic goods and services produced by the society. According to Udoffia and Godson (2016). Economic growth refers to a long term rise in capacity to supply increasing diverse economic goods to its population. Haller (2012) defines economic growth as a process of expansion of economy size, its GDP per capita with beneficial impact to citizens in terms of welfare and economic well-being. The study therefore defines economic growth as the expansion in production and quality of goods and services, improvement of infrastructure, reduction of poverty and unemployment and general improvement in the welfare and standard of living of the citizens.

Empirical Review

Okoroigwe (2024) examined the effect of Government allocations and growth/development of the Nigerian economy for the period 2016 to 2022. The study found that government expenditure on

agriculture, government expenditure on education, government expenditure on health and government expenditure on security all have positive and significant effect on the gross domestic product in Nigeria. Shkodra, Krasniqi, and Ahmeti (2022) investigated the impact of government expenditure on economic development, the study have analyzed government expenditure for the period 2002-2019 in the countries of southeastern Europe (Bosnia, Kosovo, Northern Macedonia, Montenegro, Serbia and Albania).. The result shows that the beta coefficient of wages and salaries, social transfer, subsidies and capital interventions are positive, which means that the higher the investment in wages and salaries and social transfer, the higher would be the economic growth. As a result, the study conclude that our study supports the positive effect of government spending on economic growth. Chen, Singh, and Aru (2022) examined the impact of government expenditure on economic growth in Vanuatu for the period 1981 to 2016. The study observed that fiscal factors and investment have causal effects on economic growth in Vanuatu. More specifically, government expenditure negatively influences long-run economic growth when financed by tax revenues, but positively influences long-run economic growth when financed by other sources such as non-tax revenues and budget surplus/deficit.

Nguyen and Bui (2022) analyzed the role of corruption control in the impact of government expenditure on economic growth from 16 Emerging Markets and Developing Economies (EMDEs) in Asia over the period 2002- 2019. The estimation results show that government expenditure and corruption control have a negative impact on economic growth. Javed and Husain (2022) investigated the influence of government expenditure (GE) on Oman's economic growth by examining different government-spending dimensions as predictors of economic progression based on collected time-series data of Oman for 30 years., government and private consumption expenditures (PCEs) are significantly negative in the short run. Gross domestic investment is not a significant predictor in the long run, whereas public debt is a substantial positive predictor of Oman's economic growth in the short run

Natarajan, Haq, and Sankar (2022) tested the Keynes view that public expenditure caused economic growth in the context of the Kingdom of Bahrain. 1981 to 2016. Results show unidirectional causality between public expenditure and economic growth in the Kingdom of Bahrain. Moreover, the result supports the Keynesian view of public expenditure and economic growth in the Kingdom of Bahrain. Kirikkaleli and Ozbeser (2022) investigated the correlation between government expenditures and economic growth by applying the wavelet coherence approach for the period of 1960Q2 – 2019Q3 in the United States. The result indicate that economic growth leads government expenditures in the long run, whereas government expenditures only enhance economic growth in the short run and in periods of recession. Bounsaythip and Inthakason (2022) examined the direction of causality between the government expenditures and real GDP, in view of examining the nexus between government expenditure and real GDP from Laos' public expenditure between 1980 and 2018 confirm that there is a negative long-run relationship between government investment (capital) and administration (recurrent) spending and real GDP, but a positive short-run relation between government investment (capital) and administration (recurrent) spending and economic growth.

Nwankwo et al., (2022) presents an evaluation of the effect of federal government expenditure on economic growth in Nigeria during the period 1986-2020. The result of the analysis revealed that government recurrent expenditure has significant effect on real gross domestic product, gross fixed capital formation, and savings. Government recurrent expenditure is negatively related with real gross domestic product, gross fixed capital formation, savings, and manufacturing capacity utilization. Similarly, government capital has positive relationship with gross fixed capital formation and manufacturing capacity utilization, whereas it is negatively related with real gross domestic product and savings..

Aluthge, Jibir and Audu (2021) 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 key findings of the study are 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. Oanh et al., (2021) assessed the impact of public expenditure on the economic growth of the Southern Key Economic Zone (SKEZ) of Vietnam. The results, using data of 8 provinces and cities of SKEZ from 2005 to 2016, by following the Bayesian approach and Gibbs sampling algorithm, show that the larger scale of the public expenditures, the greater the economic growth rate, while the private investment is ineffective. Foreign direct investment and the population growth have positive impact on the economic growth. Size of the labor force and the import-export ratio had negative impact on growth

METHODOLOGY

Research Design

The study uses longitudinal ex-post facto design based on panel data obtained from World Bank, Central Bank of Nigeria Bulletin and Federal Office of Statistics for the period 1970-2022. Hence, the population comprises all observations on capital and recurrent expenditure components and economic growth from 1970 to 2022. The study period covers post war, military and civilian economic data on Nigeria. Shocks were introduced in the study to cover oil boom era, depression era, structural adjustment programme, military, second republic and third republic era. Thus, the sample consisted of 53 years (1970-2022) observations which was considered a good representative of the population and adequate for reliable empirical results based on data availability. The Purposive sampling method was employed in the study.

Measurement of Variables summarized on Table 1 below:

Independent Variable	Measurement	Expected Sign
Capital Expenditure (CAE)	ratio of total capital expenditure in a given fiscal year reported by CBN	Positive
Recurrent Expenditure (REX)	total recurrent expenditure reported by CBN	Positive
Total Expenditure	Total expenditure of government as reported by CBN	Positive
Dependent Variable		
Real Gross domestic product (RGDP)	Products (GDP) Defined as the value of the goods and services produced by the nation's economy less the value of the goods and services used up in production	Positive

control Variables:		
Money supply (MOS)	Amount of money is circulation as determined by CBN	Negative/positive

Model specification

$$RGDP = \beta_0 + \beta_1 \text{LogCAE} + \beta_2 \text{LogREX} + \beta_3 \text{LogTEX} + \beta_4 \text{LogMOS} + U_1, t, \dots \dots \dots (vi)$$

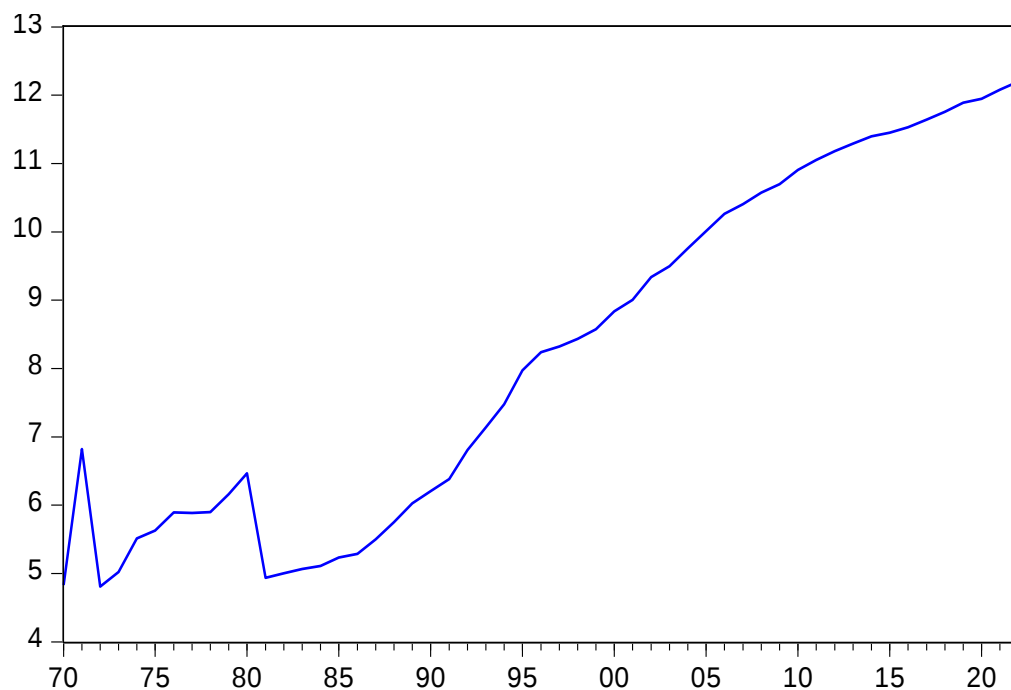
Results

Descriptive Statistics

Trend Analysis

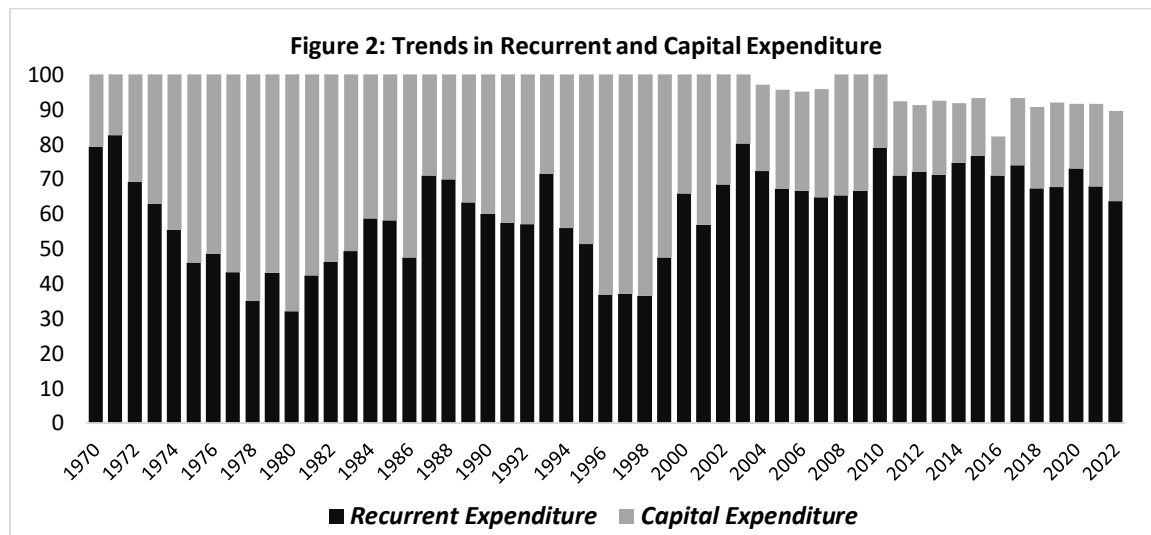
The trend in real GDP over the years, as shown in Figure 1, indicates that GDP has grown steadily over the years, apart from the recession of the early 1980s which was caused by massive reduction in expenditure due to lower revenues.

Figure1: Trends in GDP



The trend in public expenditure (in terms of recurrent and capital) is presented in Figure 2. Generally, recurrent expenditure has dominated government's fiscal application over the years. The proportion of

recurrent expenditure reached over 80 percent in 2003 and was well over 75 percent in many of the years. It is seen that the share of capital expenditure increased significantly in mid-1970s (following the oil boom), but it quickly reduced in the 1980s. The share of capital expenditure in total expenditure was higher than the share of recurrent expenditure between 1975 and in 1996 and 1997. For the other years, recurrent expenditure dominated. Also, the share of recurrent expenditure has remained very high since the advent of democracy in Nigeria from 1999. Thus, the less directly productive recurrent expenditure has been the main bulk of fiscal spending in Nigeria over the years.



Summary Statistics

The descriptive statistics for the variables used in the empirical analysis is presented in Table 2. Note that these statistics show the first and higher moment conditions of the dataset and seeks to explain the behaviour of the data.

Table 2: Descriptive Statistics for Panel Data

Variable	Mean	Max.	Min.	Std. Dev.	Skew.	Kurt.	J-B	Prob
GDPG	3.60	14.60	-13.13	5.57	-0.72	4.03	6.83	0.03
TEXG	23.77	176.36	-82.24	42.59	1.13	5.79	27.89	0.00
CEXG	27.39	166.67	-78.57	52.07	0.91	4.01	9.34	0.01
REXG	37.18	860.00	-87.80	123.74	5.81	39.17	3126.02	0.00
MOSG	120.59	5136.53	-99.88	709.62	6.99	49.91	5190.70	0.00
POPG	2.67	3.11	2.28	0.18	0.60	3.32	3.37	0.19
TOPEN	29.63	55.02	7.52	10.38	-0.19	2.72	0.50	0.78

Average annual growth in real GDP is 3.60 percent over the period, with a maximum of 14.6 percent and a minimum of -13.13 percent. This shows that the Nigerian economy has not grown smoothly

over the period and that the growth rate is generally low. The standard deviation of 5.57 for the real GDP growth variable is much larger than the mean value. This shows that annual growth rate for the years were generally disperse from the mean value. Indeed, there are large outliers in the GDP growth rates reported over the period. The average growth rates of the expenditure variables are reported in the Table. Average growth rate of recurrent expenditure at 37.18 percent per annum is highest among the expenditure components. Thus, it is seen that recurrent expenditure grows faster than total expenditure over the years. There were periods of very large increases in expenditure (especially recurrent expenditure as shown by a maximum growth rate of 860 percentage points). Population growth rate is 2.67 per annum over the study period. This population growth rate is less than the GDP growth rate of 3.6 percent, suggesting that per capital income growth rate in the country has been marginally positive over the years.

The correlation matrix is also reported in order to obtain the initial characterization of the dataset as well as the patterns of relationship among the variables. An important aspect to consider for the variables is the fact that the three measures of government spending are likely to be highly correlated. This is because, government expenditure is generally incremental in nature and tends to move both in capital and recurrent terms. This implies that variables used in a single estimation may exhibit the problem of multicollinearity. From the correlation results,

Table 3: Correlation Matrix

Probability	LGDP	TEX	CEX	REX	MOS	POP	TOPEN
LGDP	1.000						

	0.00						
TEX	0.707	1.000					
	0.00	-----					
CEX	0.673	0.985	1.000				
	0.00	0.00	-----				
REX	0.714	0.998	0.974	1.000			
	0.00	0.00	0.00	-----			
MOS	0.731	0.939	0.899	0.947	1.000		

	0.00	0.00	0.00	0.00	-----	
POP	0.962	0.804	0.765	0.812	0.808	1.000
	0.00	0.00	0.00	0.00	0.00	-----
TOPEN	0.225	-0.125	-0.081	-0.143	-0.177	0.037
	0.10	0.31	0.50	0.30	0.20	0.79

Among the expenditure variables, there is a strong positive correlation among the three variables. Indeed, the correlation coefficient between Tex and REX is 0.998, while it is 0.985 with CEX. Also, CEX is correlated with REX with a coefficient of 0.974. This shows that the correlations among the expenditure variables are too large for these variables to be included in a single equation. In order to minimise the problem of multicollinearity in the estimates, the three variables are estimated in a recursive way. With this method, the effects of each variable on economic growth are observed without encountering multicollinearity.

Test for Normality of Data

The normality (based on the Kernel tests) for the variables the charts shown in Figure 3a-3c indicate that none of the variables is normally distributed since the kernel plots are all concentrated away from the centre of the plot and there are also mostly widely spread. This outcome is to be expected since the datasets are widely obtained as a pool of different banks over different time periods. Thus, the OLS estimation of the relationship may not be feasible.

Figure3a: Kernel Density Test for GDP

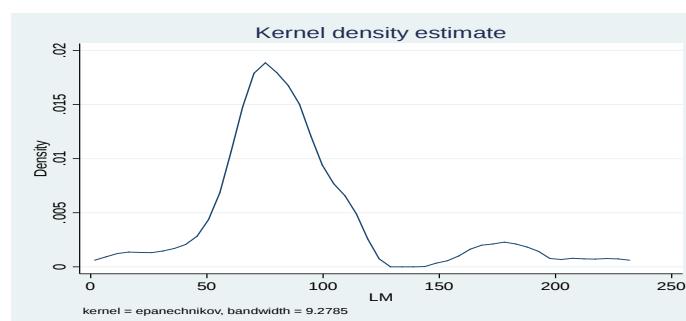


Figure3b: Kernel Density Test for TEX

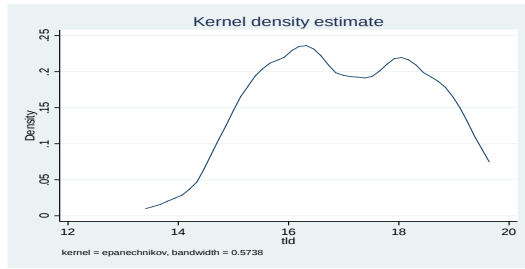
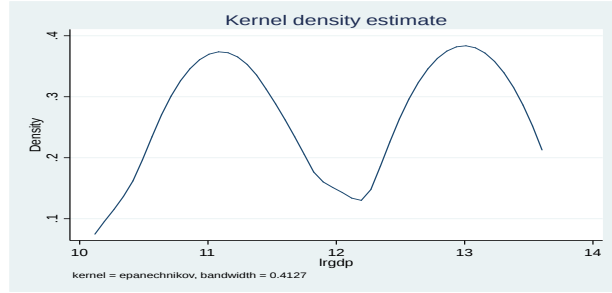


Figure3c: Kernel Density Test for CEX



Unit Root and Cointegration Analysis

In this study, the test for stationarity of the data series is performed using two different methods namely, the Augmented Dickey Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure. While the ADF test is an indirect process of testing for unit roots, the KPSS tests are more direct in terms of the null hypothesis. The results of the unit root tests are presented in Table 4.

Table 4: Unit Root test for Variables

Variable	ADF Test		KPSS		Order of Integration
	Levels	First Difference	Levels	First Difference	
GDP	-0.484	-6.592**	0.820**	0.119	I(1)
MOS	-1.012	-7.003**	0.512**	0.140	I(1)
TEX	-3.263*	-3.454*	0.586*	0.205	I(0)
CEX	-0.358	-8.727**	0.968*	0.193	I(1)
DEBT	0.219	-5.890**	0.771**	0.402	I(1)
REX	0.804	-5.373**	0.841**	0.273	I(1)
POP	-3.273*	-3.171*	0.144	0.991**	I(0)
TOPEN	-2.938*	-3.085*	0.252	0.498*	I(0)

Note: * indicates signifies at 5 percent; 95% critical values are reported in parentheses below each test value

Source: Author's computation

From the results of the ADF tests reported in the first panel of the Table, it can be seen that the ADF test statistics for each of the variables in levels (except for INFL, TEX, POP and TOPEN) are less than the 95 percent critical values indicating that they are insignificant. On the other hand, the test statistic values for the series in first differences are greater than the critical values at the 5 percent significance level . Thus, those variables are non-stationary in levels but their first differences were found to be stationary. This implies that most the variables in the study are integrated of order one (or I[1]).The result shown in the second panel of Table 4 indicates that for each of the series, the null

hypotheses of stationarity cannot be rejected for the variables in first differences (the tests statistics fail the test), apart from POP and TOPEN variables. This indicates that the series are difference-stationary and that all the variables are actually $I(1)$. This implies that a dynamic long run relationship may be estimated based on the ARDL approach to cointegration for the dynamic analysis. Essentially, it is appropriate to use cointegration analysis to estimate the relationships between the variables.

From the unit root tests, it is seen that most of the variables are $I(1)$ while three are essentially $I(0)$. Thus, there is the need to establish the cointegration status of the data in order to determine the long run equilibrium relationship among the variables. Note that not all variables in the model are integrated of the same order. Hence, the test for common stochastic trends or cointegration is performed using Bounds cointegration test procedure in order to further determine the long run time series properties. The evaluation of the Bounds cointegration results shown in Table 5 is based on the critical F-statistic values for the lower and upper bounds as also reported in the results.

Table 5: Bounds Cointegration Test

Test Statistic	Value	Signif.	I(0)	I(1)
<i>Eqn: GDP</i>				
F-statistic		10%	2.37	3.2
K		5%	2.79	3.67

Source: Author's computation

The results in Table 5 indicate that the computed F-values for the Bounds test for each of the equations are all larger than both the $I(0)$ and $I(1)$ Bounds tests at the 5 percent. The F-values therefore pass the significance test at the 5 percent level for all the sustainable development estimates equations. Thus, a long run relationship is established between economic growth and both the public expenditure variables and other variables in the model. This provides a strong background for the analysis of the ARDL model in the study.

Regression Analysis

In this section the ARDL technique is used to estimate the relationships between the expenditure variables and economic growth in the study. The process of ARDL analysis involves first examining the lag selection procedure in order to determine the optimal lag length that expresses the relationship.

Lag Length Selection

In the lag selection, optimality of the model was determined using both the Akaike Information Criterion (AIC) and Schwarz–Bayesian Criterion (SC). The results are presented in Table 4.5.

Table 6: Lag Length Selection Criteria

<i>No of Lags</i>	GDP	
	<i>AIC</i>	<i>SC</i>
0	1.2	0.51
1	-2.12	-0.66
2	-1.94	-1.77
3	-1.62	-1.63
4	-2.63*	-2.05*
5	-1.63	-0.92

Note: * indicates selected lag. Source: Author, computation.

Analysis of ARDL Results

In this section, the estimated ARDL results for economic growth is presented. As indicated earlier, the ARDL procedure generates two estimates for the equations: the short run estimates and the long run estimates. The diagnostic test in the equations is based on the adjusted R-squared values. This provides a consistent structure for the investigation of the dynamic relationship between the public expenditure and economic growth in Nigeria. As suggested earlier, the equation is estimated in a recursive manner with each of the three expenditure variables included in the estimated equation.

Public Expenditure and GDP

The dynamic effects expenditure on GDP growth is also estimated and the results are presented in Table 7. The diagnostic tests are also impressive since the results show that at least, 94 percent of the systematic variations in GDP was explained by the model. In the result the coefficients of total and capital expenditure do not feature in the short run estimates. This shows that total and capital expenditures do not have relationship with short run changes in GDP in Nigeria. The coefficient of the third lag of REX is significant in the model and is positive. This shows that recurrent expenditure has a delayed positive effect on GDP growth in Nigeria. A rise in recurrent expenditure tends to lead to increase in GDP in the short run. The coefficient of the error correction terms is significant and negative for the equations. This means that there is long run stability in the estimates. The error correction terms are generally low at about -0.3 for the equations. This means that adjustment to equilibrium is relatively slow for GDP, since only 30 percent is completed in the first period of adjustment.

Table 7: Results for Government Expenditure and Real GDP

Variable	<i>Total expenditure</i>			<i>Capital expenditure</i>			<i>Recurrent expenditure</i>		
	Coeff.	t-Stat.	Prob.	Coeff.	t-Stat.	Prob.	Coeff.	t-Stat.	Prob.
<i>Short run</i>									

REX							0.038	1.00	0.32
REX _{t-1}							-0.072	-1.40	0.17
REX _{t-2}							-0.001	-0.02	0.98
REX _{t-3}							0.093	2.13	0.04
LMOS	0.405	27.89	0.00	0.423	25.96	0.00	0.381	12.27	0.00
POP							-0.142	-4.97	0.00
ECM _{t-1}	-0.363	-14.02	0.00	-0.321	-13.29	0.00	-0.375	-5.08	0.00
<i>Long run</i>									
TEX	0.242	2.10	0.04						
CEX				0.067	0.75	0.46			
REX							0.386	2.09	0.04
LMOS	0.690	7.02	0.00	0.796	9.16	0.00	0.658	3.33	0.00
TOPEN	0.012	1.95	0.06	0.018	2.16	0.04	0.008	1.65	0.11
POP	-0.002	-0.45	0.65	0.001	0.14	0.89	0.000	0.03	0.97
Constant	2.668	12.07	0.00	2.612	9.63	0.00	3.312	9.33	0.00
Adj. R-sq.	0.945			0.940			0.956		
D-W stat	1.886			1.794			1.702		

The long run estimates for the effects of expenditure on GDP growth is also presented in the lower panel of the estimates in Table 7. In the result, the coefficients of TEX and REX both pass the significance test at the 5 percent level. This shows that total expenditure and recurrent expenditure are the main factors that improve GDP growth in Nigeria. The result shows that capital expenditure does not exert long run effects on GDP growth in Nigeria. On the other hand, a sustained increase in recurrent expenditure over time leads to increases in GDP growth by as much as 0.386 percentage points. Thus, it is recurrent expenditure that drives long run GDP growth rather than capital expenditure in Nigeria. The coefficients of money supply and trade openness are also significant and positive in the long run estimates. This shows that increase in money supply and expansion of international trade enhance GDP growth over the long-term in Nigeria.

Post Estimation Tests

In order to check for the robustness of the estimates in the study, the multicollinearity, normality and serial correlation tests are conducted, and the results are presented.

Multicollinearity Tests

In Table 8, the results of the multicollinearity test for the model results (containing the three expenditure variables separately) are presented. In the result, only the centred variance inflation factors (CVIF) variables are reported since each of the equations contains a constant term. The VIF value must be less than 5.0 for the variable in an equation to be free from collinearity. In the report on Table 8, the Centred VIF values for all the variables are less than 5.0. Thus, it can be seen that the estimated coefficients for the equations do not integrate excessively among themselves and the estimates are therefore reliable.

Table 8: Post Estimation Test Results

Variable	TEX	CEX	REX
TEX	2.233		
CEX		3.044	
REX			1.560
LMOS	3.253	3.791	2.933
TOPEN	2.662	3.102	2.400
POP	3.457	4.029	3.117

Tests for Stability of Regression

The initial form of tests for stability is conducted by observing the residuals from the estimates in terms of their serial correlation and normality. The normality test is also conducted using the J-B procedure since this test also helps to determine stability of estimates. Note that the serial correlation tests are performed using the LM statistics. The results for all the estimates are presented in Table 9. From the results, none of the J-B and LM statistics passed the significance test even at the 5 percent level which implies that the null hypothesis is accepted in both cases. The null hypothesis is the absence of non-normality and serial correlation respectively. Thus, the tests indicate that the residuals are normally distributed and are devoid of serial correlation. Thus, the estimated equation can be adjudged to be stable and effective for long term prediction and analysis.

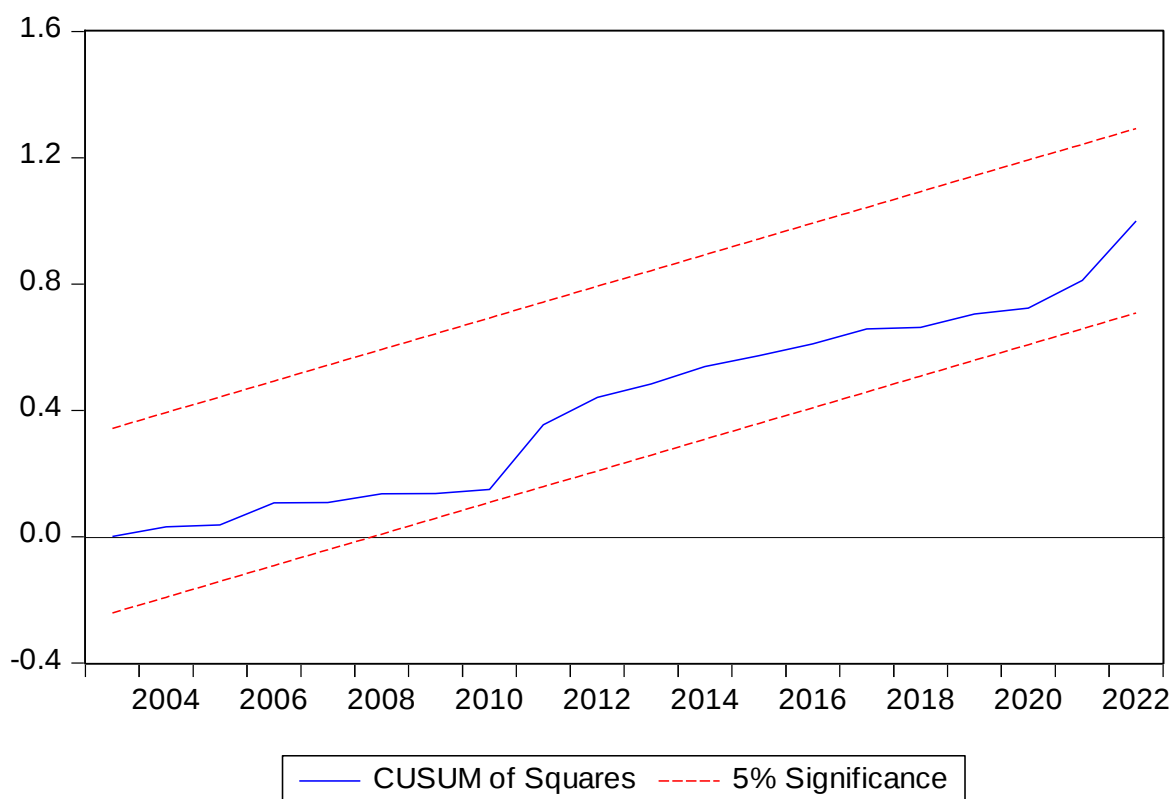
Table 9: Post estimation test results for serial correlation and normality

Model	Test	Stat. (prob)
GDP	Normality test (J-B)	2.95 (0.12)
	Serial Correlation LM Test	1.27 (0.33)

Note: p-values in parentheses. Source: Author's computation

A visual test of the stability of the estimates is also conducted using the CUSUM of squares tests. This helps to eliminate doubt about possible outlier regression for any of the groups in the sample. The chart in Figure 4 show the result of the CUSUM of squares test for recursiveness of error accumulation for the five categories of revenues that were performed in the study. It can be seen that the CUSUM of squares line lies entirely within the dotted 5 percent significance bound line throughout the chart. This reveals that the estimation is stable within the analysis and there are no issues of structural breaks or outlier effects in the estimation

Figure 4: CUSUM for GDP



Tests of Hypothesis

The tests of the hypothesis of the study is performed within the 5 percent level of significance. The focus is on the long run estimates for the hypothesis since the long run estimates provide more stable impact measurements.

H01: There is no significant effect of capital expenditure, recurrent expenditure and total expenditure on gross domestic product in Nigeria

In order to test this hypothesis, the focus is on the coefficients of TEX, CEX and REX in the long run estimates in Table 7. In the results, the coefficient of TEX is 0.242 ($p < 0.05$), the coefficient of CEX is 0.067 ($p > 0.05$) and that of REX is 0.386 ($p < 0.05$). In this case the coefficients of all the TEX and REX variables pass the significance test at the 5 percent level, while the coefficient of CEX fails the test at the 5 percent level. Based on this outcome, the null hypothesis is rejected for REX and TEX but

it cannot be rejected for CEX. This implies that while recurrent expenditure and total expenditure have significant positive long run impacts on gross domestic product in Nigeria, the effect of capital expenditure is insignificant.

Discussion of Findings

Public expenditure is the backbone for stimulating aggregate demand in most developing countries, including Nigeria. In this study, the impact of public expenditure on economic growth in Nigeria was examined. The aspects emphasized the role of fiscal spending in influencing the path to economic growth in Nigeria. Thus, the study considered the distributional outcomes of public expenditure on economic growth. In the study, in terms of GDP growth. One economic growth factor was examined in the study. Public expenditure was considered in terms of capital versus recurrent segments, while total expenditure was also included for robustness.

The dynamic flows in economic growth implies that a dynamic structure was devised for the analysis and the ARDL estimation framework was adopted for the empirical analysis. The data used was annual secondary data for the period of 1970 to 2022. From the analytical framework, both the long run and short run impacts of public expenditure on economic growth was obtained, although the focus was on the more stable long run estimates. In general, the results from the study confirmed public expenditure can help to drive economic growth in Nigeria. In particular, the following findings were made:

1. That while recurrent expenditure and total expenditure have significant positive long run impacts on gross domestic product in Nigeria, the effect of capital expenditure is insignificant. This finding agrees with the findings of Abomaye-Nimenibo and Samuel (2020); Aluthge, Jibir and Audu (2021), Shkodra, Krasniqi, and Ahmeti (2022) and Okoroigwe (2024) but negates the findings of Nwankwo et al., (2022) Bounsaythip and Inthakason (2022); Chen, Singh, and Aru (2022)
2. That the long run effects of public expenditure on economic growth are generally different from the long run effects.

Recommendations

The following recommendations are made based on the findings from the study: It was also found that only recurrent expenditure generally leads to long run growth in GDP in Nigeria. Thus, programs that help to boost income levels of individuals need to be promoted in order to boost GDP growth, rather than only focusing on capital projects. In this case, programmes like money transfer and school feeding schemes will more directly boost economic growth in the long run. Finally, there is need to boost the macro economy in order to improve on the absorption capacity as well as the productive base of the economy. If the absorption capacity in the economy is boosted, then public spending can have more multiplier effects on economic growth in the long run in Nigeria.

Conclusion

Public expenditure forms the basis for overall aggregate expenditure drive in many developing countries, including Nigeria. This is the reason for continued empirical interest on the roles of financing and spending patterns on the economy. More importantly, economic growth involves coordination of all aspects of the economy, including the private and public sectors both in terms of

investment and decision-making. In this study, the role of public expenditure in the drive for economic in Nigeria was examined. There is evidence that focus on increasing public expenditure can ensure long-term growth in GDP in the economy. Thus, there is the need for all stakeholders to contribute to the drive for economic in Nigeria. The study has shown that the government needs to take lead as a crucial factor in economic growth impacts in Nigeria

Implication of the study for Theory

The study found a positive association of government expenditure to economic growth. This finding agrees with the Keynesian economic theory which postulates that government spending creates multiplier effect thereby stimulating private spending whilst simultaneously and synergistically enhancing economic growth. The result of the study however disagrees with the classical theory and Richardson Equivalence principle which suggests that interventions create inefficiency and fiscal policy is unnecessary.

Suggestions for Further Study

This study focused on Public sector expenditure and economic growth using autoregressive distributive. Economic growth was proxied using gross domestic product. Other studies can use different methodologies to study the effect of fiscal policies on economic performance and growth. Also, other studies can use different variables to study the effect of governmental expenditure on the economy. More control variables such as public debt, interest rate and exchange rate can be introduced to decipher the effect of expenditure on the economy of Nigeria

Contribution to knowledge

The goal of the study was to determine the effect of public sector expenditure on economic growth in Nigeria. The study achieved the stated objective and contributes to knowledge as follows:

- 1) Contributes to the fledging debate on the subject and enriches the literature.
- 2) Future scholars and policy makers will find the work useful
- 3) The study further contributes to knowledge by showing that only recurrent expenditure generally leads to long run growth in GDP in Nigeria.

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