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The impact of capital expenditure on economic growth in Nigeria

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Abstract
The research work investigates the role of capital expenditure in promoting the growth of the Nigeria economy. The work used disaggregated government spending on education, social and community services, and transfers as explanatory variables. The research work explored annual data on the variable from the CBN statistical bulletin for the period of 1991 to 2022. The stationarity of the series were confirmed using the Augumented Dickey Fuller (ADF) technique. The outcome of the unit root test revealed that except expenditure on transfer, all other variables were not stationary at their levels but all the variables were stationary at first difference.Therefore, the research work explored the autoregressive distributed lag (ARDL) technique to estimate the model. The outcome of the Bound test revealed that there is the evidence of long run relationship among the variables. The signs on the coefficients that government expenditure on capital projects in education and services, social and community services have positive impact on economic growth in Nigeria. The study also found that expenditure on transfers has negative impact on economic growth both in the short run and long run. On this note, the study recommended an increase in government expenditure on capital projects particularly on infrastructures that promote productivity in the economy.

Keywords: capital expenditure, social and community services, transfers, economic growth

1. Introduction

One of the macroeconomic goals of government economic policies is to achieve a desired level of economic growth and development. The pattern of government expenditure is one of the potential instruments at the disposal of government to achieve a sustainable growth and development in developing economies. This is because it is essential in accelerating economic activities of a country. Most of the governments in developing countries use public expenditure as a tool to develop some areas by direct allocation of resources into those areas particularly project on infrastructures. A sustainable economic growth is one of the macroeconomic goals that every nations desire to achieve. Ijuo & Andohol (2020) [7] observed that achieving a rapid and sustainable economic growth and development is a major goal of most economies of the world both developed and developing countries desire to achieve, Nigeria is not left out in the pursuit of this desirable objective.

According to Okpabi *et al*. (2021) [10], the role of government spending for sustainable economic growth has gained the attention of many scholars particularly in developing economies. This is important for developing countries like Nigeria, most of which are facing the problem of infrastructural deficits.

Infrastructural development is widely acknowledged as a key for rapid growth and development of any economy. This is because infrastructures serve as complementary inputs in any production process. Hence, no nation can realize its growth potential without massive investment in its infrastructures. The poor state of infrastructures in.

Nigeria is one of the major challenges that Slow down the growth pace of industrial sector in the country.

The term infrastructure refers to the economic structures that accelerate production, distribution and exchange of goods and services. These include; power supply, good road network, railway, waterway, communication network, health facilities and water supply.

This research work is designed to investigate the role of government spending in promoting the growth of the Nigerian economy. The paper is structured such that this section gives the introduction of the paper. Section two provides the review of related literature, while section three contains the methodology of the study. Section four provides the results and discussion while the last section provides the conclusion and policy recommendation from the study.

2. Literature Review

Theoretical Review

There is plethora of theories that established a functional and long run relationship between government expenditure and economic growth. Most of the theories focus on the role of government expenditure in promoting economic growth. The existing theories on public expenditure include the Wagner's theory of increasing state activities, Peacock and Wiseman displacement theory, Lozano theory of fiscal policy and the Keynesian theory of fiscal policy etc.

This research is based on Musgrave and Musgrave theory of public expenditure which explain the growing public expenditure on the basis of industrialization stages viz: pre-industrial, industrial an post-industrialization state. Based on this, in pre-industrial stage, public expenditure is low as all incomes are devoted to meeting all basic needs because demand for goods is generally low. In industrial stage, public expenditure is high because rising income results in high demand for public goods like health, education, social security, transportation, etc. in post-industrial stage, public expenditure is low as more of the basic needs have been met. In view of the foregoing, Musgrave maintained that increasing demand for public goods necessitates a corresponding increase in government spending. He opined that increase in per capital income leads to increase in privately owned goods which on projects that can result to increase in goods and services. The Nigeria economy is a typical example of industrializing or emerging economy as there is increasing growth in the economy resulting from the new emerging sectors like the information and communication, entertainment and the financial technology that are capable of improving the living standard of the people.

Empirical Review

There have a lot of literature by scholars on the role of public expenditure on economic growth in many economies of the world.

Adopted the Ordinary Least Square (OLS) estimation technique to evaluate the impact of public expenditure on the growth of the Nigerian economy and found that Government capital expenditure have negative impact on the real gross domestic product, While Government recurrent spending have positive impact on the real gross domestic product.

Chude & Chude (2013) [3] used econometric method to examine the role of public expenditure in education in promoting economic growth in Nigeria over a period from 1977 to 2012. The study used disaggregated expenditures on the sectors of the economy. The results of the study revealed that public expenditures on education have positive and significant impact on economic growth in Nigeria in the long run. Employed the Ordinary Least Square (OLS) to investigate the impact of public expenditure on economic growth. The study used disaggregates public expenditure on public debt expenditure, public expenditure on health and education. The results of the study show that government expenditure on health have negative impact on economic growth, while the public spending on education was found to have positive impact on the growth of the Nigerian economy. The findings on the impact of spending on health disagree with apriori expectation. This might be due to misappropriation of public funds. Yusuf *et al*. (2015) [12] used ARDL (Bound test) to investigate the relationship between public expenditure and economic growth in Nigeria (1984-2013). The findings from the study shows that government spending on defense have negative impact on economic growth while public expenditure on agriculture have positive impact on economic growth in both short run and long run. However, the government expenditure on education and transport/communication have positive impact on economic growth but have no impact on economic growth in the long-run. Ebiringa & Charles-Anyaogu (2012) [6] applied Bound Test Co-integration Approach to assess the Impact of Government Expenditures on the growth of the Nigerian economy. The findings of the study revealed that public spending on telecommunication, defense, education and health has positive impact on the growth of the Nigerian economy while the government expenditure on agricultural and transport sectors have negative on economic growth in Nigeria. The study therefore conclude that there is inadequate government investment on transport and agricultural made it difficult to build the much needed capacity in the contribute positively to economic growth.

3. Research methodology

This section discussed the method data collection, source of data and estimation techniques. The data on government expenditures on real gross domestic product (RGDP), economic services, social and community services and transfers were sourced from the Central Bank of Nigeria (CBN) statistical bulletin from 1990- 2022.

Augumented Dickey Fuller (ADF) test was adopted as pre-estimation technique to check the behavior of the data series. While the Johansen co-integration technique was employed to investigate the long run relationship among the variables.

Model specification

The model is specified in equation 1 where real gross domestic product (RGDP) a proxy for economic growth is the dependent variable while expenditure on economic services, social and community services and transfers were the independent variables.

$$RGDP = f\ (ES, SCS, TR) \quad (1)$$

The model in econometric form is stated in equation 2.

$$RGDP = \alpha 0 + \alpha 1ES + \alpha 2SCS + \alpha 3TR + u \quad (2)$$

Table 1: Variable Label

S/N	Type	Variable Label	Description	Appriori Expectation	Source
1	Endogenous	GDPG	GDPG represents gross domestic product growth rate.		CBN
2	Exogenous	ES	ES is expenditure on Economic services	Positive	CBN
3	Exogenous	SCS	SCS is the capital expenditure on social and community services	Positive	CBN
4	Exogenous	TR	TR is expenditure on transfers	Positive	CBN

Estimation Procedure

The estimation begins with conducting stationarity test. This is necessary because most time series data are often non-stationary at level. The use of such data in estimation will give a spurious regression (Gilbert and Kehinde, 2018). The study employed Augumented Dickey Fuller (ADF) test, which is based on the null hypothesis that the series have a unit root. Stationarity test provides the basis to know the order of integration of the variables employed in the model. The second pre-estimation test is the co-integration test. Co-integration test helps to determine if there evidence of some long-run relationship among the variables in the model. It is important to note that if all the variables are stationary at I(1) then the conventional Engle-Granger or Johansen co-integration test can be employed depending on the sample size. Otherwise, if the series were stationary at I(0) and I(1), then the ARDL bound test is most appropriate co-integration test. Lastly, if all variables were stationary at their levels I(0) then testing for co-integration becomes less compulsory. The study adopted ARDL bound test to measure the long-run equilibrium relationship among the variables.

After conducting the stationarity and co-integration test, the estimation of the model was carried out using Autoregressive distributed lag (ARDL) model which provides information about short-run and long-run parameters as well as the speed of adjustment between the variable incorporated into the estimation equation.

4. Empirical Results

Table 1 presents the ADF test result which is a test for stationarity of the variables employed in this study. On the other hand, the ARDL bound test for co-integration was explored to check the long-run relationship between the dependent variable and independent variables used in this paper. The ARDL bound test compares the calculated F-statistic to the lower and upper bound table value at a chosen significance level, if the F-statistic is greater than any of the upper bound value then we can conclude the variable are co-integrated (that is they are all integrated of I(1)).

The ADF unit root test results reveals that all the variables in this study are stationary at only first difference except expenditure on transfer (TR) that was stationary at both level and first difference. This indicates that gross domestic product annual growth rate (GDPg), government spending on economic services (ES) and expenses on social and community services (ESC) are stationary at only first difference (I(1)). This validates the use of ARDL bound test to confirm if all variables are integrated of order I(1) and co-integrated in the long run.

Table 2 which presents the ARDL bound test result indicates that all variables used in this paper are co-integrated at I(1) because the F-stat value is greater than the upper bound value even at 1%, 2.5%, 5% and 10% level of significance. This signifies that there is evidence long-run relationship among the variables. Alternatively, this means that, GDPg, ES, SCS and TR are all I(1) and co-integrated.

Table 2: Augmented Dickey Fuller (ADF)

Variables	Augmented Dickey Fuller (ADF)/ (Prob values)		Order of Integration
	ADF value	Prob. value	
LES	-6.161149	0.0000	**I(1)**
LSCS	-7.643586	0.0000	**I(1)**
GDPg	-7.583911	0.0000	**I(1)**
TRO	0.0017	0.0000	**I(0) and I(1)**

Author's compilation (2023) with the aid of Eviews 9.0

Table 3: Bound Test Results

Test Statistic	Value	k
F-statistic	9.22735	4
Critical Value Bounds		
Level of Significance	I0 Bound	I1 Bound
10%	4.72	5.77
5%	5.23	6.35
2.50%	5.69	7.56
1%	7.29	8.61

Author's compilation (2023) with the aid of Eviews 9.0

Table 4: GDPG ARDL Co-integrating and Long Run Form Model

Co-integrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(ES)	-0.478044	0.282559	-1.854317	0.0177
D(TR)	-0.988950	0.081812	-0.48227	0.5438
D(SCS)	-0.271939	0.05005	-2.668617	0.0742
D(SCS(-1))	0.009329	0.046739	2.260581	0.0340
D(SCS)	-0.000077	0.034156	-2.333148	0.7588
CointEq(-1)	-0.588950	0.172491	-5.30895	0.0000
Long Run Coefficients				
ES	-0.053826	0.186062	-0.458259	0.6964
TR	0.009453	0.079393	1.002601	0.5457
SCS	-0.456443	0.061509	-3.326366	0.0031
C	5.308681	4.470122	2.082422	0.0491

Author's compilation (2023) with the aid of Eviews 9.0

The first part of Table 3 is the short run equation. The difference between the short run and the long run equation is the error correction term (ECT). The results of the short run as shown in the table revealed that government expenditure on economic services (ES), expenditure on social and community services has a significant effect on economic growth(GDP).while the government expenditure on transfers has not significant effect on GDP growth rate The chosen level of significance here too is 5% and 10%.

The results also revealed that government expenditure on economic services and spending on social and community services have positive impact on the Nigeria's GDP growth. While the government spending on transfers has negative impact on the GDP growth.

The Error Correction Term in the Short run equation meets the three conventional condition, the coefficient of the error correction term revealed that about 56.89% of disequilibrium in the economy will be restored within one year in Nigeria.

In conclusion, the results revealed that government capital expenditure have positive and significant impact on

economic growth both in the long run and short run.

5. Conclusion and Recommendations

This study investigates the impact of capital expenditure on economic growth in Nigeria. The work used real gross domestic product as dependent variable and disaggregated government expenditures on education and services, social and community services, and transfers as explanatory variables. The study employed the autoregressive distributed lag (ARDL) model as estimation technique. The results of the Bound test confirmed the established the long run relationship among the variables. The findings from the study indicates that government expenditure on capital projects in education and services, social and community services have positive impact on economic growth in Nigeria. The study also found that expenditure on transfers has negative impact on economic growth both in the short run and long run. On this note, the study recommended an increase in government expenditure on capital projects particularly on infrastructures that promote productivity in the economy.

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