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The Impact of Public Sector Spending on Economic Growth of Nigeria

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Abstract

The study investigated the impact of public sector spending (administration, agriculture, education, economic, social and community transfer, industry and health services) on economic growth in Nigeria for the period spanning between 1960-2010.The objectives of the study are to estimate the relationship between aggregate public sector spending on economic growth and determining the specific public sector spending variables on economic growth. The variables were tested for stationarity and cointegration while regression and correlation analyses were used as analytical techniques.

The results found out that recurrent and capital expenditure contributed positively to economic growth with particular reference to the period under review, The result therefore revealed that capital and recurrent expenditures are significant at 1% level. The study concluded that the government recurrent and capital expenditure have significant influence on economic growth in Nigeria. More so, the result of disaggregated analysis concluded that agriculture, social and community services, health and services are significant variables of government spending contributing to economic growth in Nigeria.

Keywords: Public sector, Stationarity, co-integration, Capital expenditure, recurrent, economic growth.

1.0 Introduction

Public sector entails the part of the economy concerned with provision of basic government services. The composition of the public sector varies by country, but in most countries the public sector includes such services as the police, military, public roads, public transit, primary education and healthcare for the poor. The public sector might provide services that non-payer cannot be excluded from (such as street lighting), services which benefit all of society rather than just the individual who uses the service (such as public education), and services that encourage equal opportunity. Despite the increasing level of privatization around the world, the public sector in the developing countries still continues to employ a large percentage of the workforce. It has been suggested that public service employment has been growing about four times as fast in developing countries as in developed countries. Traditionally, the public sector in developing economies has been in the forefront of economic development. As a result of the strategic importance of the public sector in the economic development of many countries, there is a concerted effort to make public sector management respond to the changing needs of developing nation.

Over the past decades and half, a substantial volume of empirical research has been directed towards identifying the elements of public expenditure (at its aggregate and disaggregate levels) that bear significant association with economic growth. The relationship between government expenditure and economic growth has continued to generate series of debate among scholars. Some scholars argued that increase in government expenditure on socio-economic and physical infrastructures encourages economic growth. For instance, government expenditure on health and education raises the productivity of labour and increase the growth of national output.

However some scholars did not support the claim that increasing government expenditure promotes economic growth, instead they assert that higher government expenditure may slowdown overall performance of the economy. For instance, in an attempt to finance the rising expenditure, government may increase taxes and/or borrowing. Thus, higher taxes reduces income and aggregate demand. In the same vein, higher profit tax tends to increase production costs and reduce investment expenditure as well as profitability of firms (Ghali, 1998).

Most economies in transition do spend heavily on physical infrastructures to improve economic welfare of the people and facilitate production of goods and services across all sectors of the economy so as to stimulate rapid growth in aggregate output. Empirical studies (like Ram,1986 and Deverajan *et al.*, l996;) have found that there exist positive correlation between economic growth and public spending on infrastructure facilities.

It is believed that the size and structure of public expenditure will determine the pattern and form of growth in output of the economy. In Nigeria, many researchers have proven in their studies that government spending has a causal relationship with economic growth. For instance studies like that of Oyinlola (1993), opined that expenditure on defense had a positive impact on economic growth in Nigeria. Contrary to the above, Akpan (2005) used a disaggregated approach to determine the components of government expenditure which includes; capital, recurrent, administrative, economic, social and community services and transfers, go a long way to enhance growth. However, from the results, the researcher concluded that there is no significant association between most components of government expenditures and economic growth in Nigeria.

In spite of its phenomenal growth and achievements, the public sector has been criticised for its major shortfalls. Similarly, some have argued that, there is no positive correlation between public expenditure and economic growth. Thus, it was suggested that the need to research into this concept particularly within the Nigerian context with a view to ascertaining the effect of public spending on economic growth. However, it has been observed that rising government expenditure in Nigeria has not translated to meaningful development as Nigeria still ranks among world’s poorest countries.

Therefore, the specific objectives are to examine the impact of public sector spending on the economic growth of Nigeria; estimate the relationship between public sector spending and economic growth and proffer recommendations based on research findings with a view to providing and enhancing public sector spending in Nigeria. However, the research questions are: What is the effect of public sector spending on economic growth? and what is the particular public sector spending that enhances the economy growth?

This study would serve as a contribution to the bundle of literature on economic growth in Nigeria. It would also pin down the specific components of government expenditure that significantly impacted on economic growth. The study would also show enlightenment on where government expenditures components are found to be individually significant. More importantly, it will throw more light on the association between economic growth and public expenditure on various sectors of the economy.

2.0 Empirical analysis

Based on economic theory that growth in public investments is positively correlated to economic growth, a number of empirical studies have been conducted to determine the effect of public investment on growth. For instance, east Africa was able to sustain a growth rate of about 7-8 percent because it maintained rates of gross capital formation of about 30 per cent of GDP (Ariyo, 1998). Odedokun (1993), in a study based on a cross-section of 42 African countries also identified investment as the factor accounting for the differential growth performance of the countries sampled between 1970 to 1987. Aschauer (1990) adopted the aggregate production function to evaluate impact of public investment on growth. The findings, based on U.S data, reported an extremely high rate of return for public capital which was between two and five times as high as for private capital, and that the accumulations of public capital has a sizable positive effects on private investment. These results suggest that an aggressive and appropriate public investment strategy can facilitate accelerated growth.

Khan and Renhart (1990) also observed that the marginal productivity of public sector capital was negative whereas that of private investment was significantly positive in respect of 24 developing countries. Also, Devarajan *et al.*,(1996) established that total government expenditure had a positive but statistically insignificant effect on growth for 43 developing countries.

Majority of the studies seem to support the theoretical postulation that public investment has a positive effect on output, some studies found no evidence for this postulation. Furthermore, some found a negative relationship [Ghali (1998) on Tunisia, and Bogunjoko (1998) on Nigeria,] while others found a weak one [Kweka and Morrisey (1999) on Tanzania].

Josaphat and Oliver (2000) investigated the impact of government spending on economic growth in Tanzania (1965-1996) using time series date for 32years. They formulated simple growth accounting model, adapting Ram (1986) model in which total government expenditure is disaggregated into expenditure on (physical) investment, consumption spending and human capital investment. It was found that increased productive expenditure (physical investment) have a negative impact on growth and consumption expenditure. However, the results revealed that expenditure on human capital investment was insignificant in their regression and confirmed the view that public investment in Tanzania has not been productive, as at when the research was conducted. The research results showed that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant. The result of sectoral level revealed that government investment and total expenditures on education were the only outlays that remain significantly associated with growth throughout the analysis. Although, public investments and expenditure in other sectors (transport and communication, defense) was found initially to have significantly associated with growth, but do not survive when government budget constraint and other sectorial expenditure were incorporated into the analysis. Also private investment share of GDP was found to be associated with economic growth in a significant and positive manner.

In line with the above, Komain and Brahmasrene, (2007) examined the association between government expenditures and economic growth in Thailand, by employing the Granger causality test. There result revealed that government expenditures and economic growth were not co-integrated. The results indicated a unidirectional relationship as causality runs from government expenditure to growth. Also the results depicted that a significant positive effect of government spending on economic growth.

Furthermore, Olugbenga and Owoeye (2007) investigated the relationships between government expenditure and economic growth for a group of 30 OECD countries during the period 1970-2005. The results of the regression showed the existence of a long run relationship between government expenditure and economic growth. In addition, the results revealed that there was a unidirectional causality from government expenditure to growth for 16 out of the total countries supplied, thus supporting the Keynesian hypothesis. However, causality was said to run from economic growth to government expenditure in 10 out of the countries; confirming the Wagner's law.

3.0 Methodology

3.1 Study area: Nigeria

3.1.1 Method of data collection

The data from this study was obtained mainly from secondary sources. The choice of the Secondary source was based on their authenticity and reliability, which culled from Central Bank of Nigeria bulletin, Federal Office of Statistics, published journals. The time span of the data was from 1960-2010. The data for dependent variable for this study is GDP (proxy for economic growth) while the data for independent variables were government spending on different sectors which include agriculture, health, transportation, communication, defense, education, and manufacturing.

3.1.2 Method of data analysis

In the empirical analysis of the impact of the public sector spending on economic growth of Nigeria, this study adopted the econometric approach in estimating the relationship between the various components which are as stated below: (i) Ordinary least square method (OLS) which involved the use of regression analysis. This was used to examine the impact of public sector spending on economic growth in Nigeria (ii) Correlation matrix- was used to examine the relationship between capital expenditure and GDP.

3.2 Model specification

The model specification for the study is as stated below:

Model 1: $Y=F(\alpha_1\alpha_2)$

$Y=(\alpha_0 + \alpha_1 CAP+ \alpha_2 REC+_{,}\mu)$

$Y=(X_{1,},X_{2,},X_3,X_{4,}X_5,X_6,X_7\ X_{8\,,}\mu)$..........................Implicit function

$L_nY=ß_o+ß_1L_NX_{1+}ß_2L_NX_2+ß_3L_NX_3+ß_4L_NX_4+ß_5L_NX_5+ß_6L_NX_6+ß_7L_NX_7.+ß_8X_8+\mu$..doublelog eqn

CAP=Capital expenditure(₦)

REC= Recurrent expenditure(₦)

Where;

Y= Economic growth (proxy by RGDP) (N'billion)

ADMIN (X_1) =Expenditure on Administration (N'm)

AGR (X_2)= Expenditure on Agriculture (N'm)

TRANS(X_3)= Expenditure on Transfers (N'm)

SOCCOM(X_4)= Expenditure on Social and Community services(N'm)

EDU(X5)= Expenditure on Education (N'm)

HEA(X_6)= Expenditure on Health(N'm)

ECOSERV (X7)= Expenditure on Economic Services(N'm)

INDUS(X_8)= Expenditure on Industry(N'm)

U=random error

Ln=Natural logarithm

3.3 ***Apriori* expectation**

A*priori* expectation is that each of the co-efficient should be positive (i.e $ß_1$, $ß_2$, $ß_3$, $ß_4$, $ß_5$, $ß_6$, $ß_7$, $ß_8$ >0).

3.4 Tests of variables

The variables or series were subjected to the following:

3.4.1 Unit Root Test: Since the data for this study are times series, the stationarity of the series was tested using Augmented Dickey Fuller(ADF) test statistics.

3.4.2 Co-integration test: To check for long run relationship among the variables (agriculture, defence, education, communication, health, transportation) Thus, the test was employed as a preliminary test of the stationarity of the data the essence of this is to prevent spurious regression results .The change in RGDP depends on the change in the explanatory variables and also on equilibrium error term that determines the short run behaviour of the model. In the short run, there may be disequilibrium. Thus, the error term is to show the short run behaviour of RGDP to its long run values. U_{t-1} is the mechanism that adjusts to the long run equilibrium unit if distortions occur.

The above mentioned tests were analyzed using E-view statistical package version 5 while the correlation analysis was analysed using statistical package for social scientists (SPSS) version 16.

Tests of statistical adequacy among the models include: Co-efficient of determination (R-square),T-statistics, Durbin Watson (D-W) statistics, Standard error of co-efficient (SEC) etc. These were carried out to assess the relative significance of the variables, the desirability and reliability of model estimation parameters.

4.0 Results and Discussion

4.1 Regression analysis

4.1.1 Aggregated analysis

The result of the table 1 shows that capital expenditure is inversely related to the economic growth, although it is statistically significant at 1% level of probability. However, the recurrent expenditure shows positive relations as well significant to economic growth. A positive coefficient implies that a percentage increase in recurrent expenditure would lead to 126% increase in economic growth (proxy by GDP) .This could however be attributed to the level of productivity among citizenry. R^2 values shows that 99% of the total variation in economic growth is been explained by both capital and recurrent expenditure.

The F-statistics shows that the model has a good fit as the model is significant at 1% level of probability. The Durbin Watson statistics which is used to test the existence of serial correlation between the public sector spending variables shows that there is absence of serial correlation.(i.e D.W is 1.01) which shows a positive auto correlation.

Table 1**:** Aggregated analysis

Dependent Variable: LGDP
Method: Least Squares
Date: 01/11/01 Time: 23:10
Sample: 1961 2010
Included observations: 50

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.758385	0.142636	-12.32781	0.0000
LCAP	-0.232735	0.078991	-2.946354	0.0050
LREC	1.265752	0.079529	15.91553	0.0000

R-squared	0.991629	Mean dependent var	8.258016
Adjusted R-squared	0.991273	S.D. dependent var	3.316261
S.E. of regression	0.309803	Akaike info criterion	0.552365
Sum squared resid	4.510963	Schwarz criterion	0.667086
Log likelihood	-10.80912	F-statistic	2783.821
Durbin-Watson stat	1.018695	Prob(F-statistic)	0.000000

4.1.2 Disaggregated analysis

Table 2 shows the R^2 test which indicates the total variation in the dependent variable being explained by the independent variables. This means that about 99.8% of the variation or changes in economy growth were revealed by the explanatory variables (expenditures in various sectors of the economy) under review.

The estimated co-efficient points to the fact that a percentage increase in government expenditure in Agriculture will bring about 65.6% growth in GDP , while increase in government spending in Administration will reduce the growth of the economic growth by 13.2%. Also government spending in social and community service will reduce Economic growth by 8.6%. while government spending on economic service would equally bring about a reduction in the country's economic growth by 3.2%. Government spending on transfer and industry would increase economic growth by 0.31% and 37.4% respectively. Also government spending on education would increase the GDP by 2.8%. However, government spending in health reduces economic growth by 8.8% while government spending in services would bring about an increase in economic growth by 30%.

The estimated coefficients of the variables included in the model gave the expected signs (positive influence on economic growth) except government spending in administration, social and community services, economic service and health.

The Durbin Watson statistics is used to test the existence of serial correlation between the variables. Durbin Watson is equal to 0.85, which implies a positive auto correlation.

However, test of significance of each variables shows Agriculture being significant 1% at level of probability and this is an indication that agricultural sector contributed to the economic growth. Administration is significant 1% level of probability, and indicates that Administration sector contributed to the economic growth. Social and community services are significant at 1% level of probability, which indicates that social and community service sector contributed to the economic growth. Economic services, transfers and education were not significant indicating that the sectors do not contribute to the Economic growth. Industry is significant at 1% level of probability thus, indicates that industry contributed to the economic growth.

Health and services sectors were significant at 1% level of probability and this is an indicator that health and service sectors contributed to the economic growth. This implies that government spending on (Agriculture, Administration, Social and community services, Industry, Health, and Services) were significant variables at 1 % while government spending on (Ecoservice, Transportation, Education.) were statistically in significant. Therefore, that government spending in AGRIC, SOCCOM, INDUS, HEA, and SERV are significant factors that impacted positively on the level of economic growth in Nigeria.

Table 2: Ordinary least square (disaggregated analysis)

Dependent Variable: GDP
Method: Least Squares
Date: 06/26/12 Time: 13:59
Sample(adjusted): 1960 2008
Included observations: 49 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGRIC	0.656910	0.062653	10.48494	0.0000
ADMIN	-0.131681	0.053731	-2.450756	0.0187
SOCCOM	-0.086118	0.032199	-2.674581	0.0108
ECOSERV	-0.032204	0.043454	-0.741119	0.4630
TRANS	0.003100	0.024212	0.128053	0.8987
INDUS	0.373957	0.058175	6.428117	0.0000
EDU	0.027638	0.032650	0.846491	0.4023
HEA	-0.087672	0.032200	-2.722739	0.0095
SERV	0.300432	0.078644	3.820137	0.0005

R-squared	0.998678	Mean dependent var	11.89457
Adjusted R-squared	0.998414	S.D. dependent var	3.050214
S.E. of regression	0.121488	Akaike info criterion	-1.213599
Sum squared resid	0.590372	Schwarz criterion	-0.866122
Log likelihood	38.73317	Durbin-Watson stat	0.855531

4.2 Correlation analysis

The results of correlation analysis showed a strong positive relationship between capital expenditure and GDP (i.e 0.973). Also, the results also revealed that recurrent expenditure is strongly and positively related to GDP being a proxy for economic growth. However, the results indicated that capital and recurrent expenditure were significant at 1% level.

Table 3: Correlation

		Gross Domestic product	Capital expenditure	Recurrent expenditure
Gross Domestic product	Pearson Correlation	1	.973**	.995**
	Sig. (2-tailed)		.000	.000
	N	50	50	50
Capital expenditure	Pearson Correlation	.973**	1	.985**
	Sig. (2-tailed)	.000		.000
	N	50	50	50
Recurrent expenditure	Pearson Correlation	.995**	.985**	1
	Sig. (2-tailed)	.000	.000	
	N	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

4.3 Test of Series results

4.3.1 Unit root test

Prior to the estimation of growth model, standard econometric test like stationarity and cointegration tests were conducted in other to avoid spurious regression results. The result of stationarity (unit root) is as shown in table 3. It should be noted that variables like GDP was stationary at second difference agriculture, health and administration, at first difference while social and community service, economic service, transfer, industry, education were stationary at level.

The results of the stationarity (unit root) tests indicate that AGRIC,ADMIN, and HEA were stationary at first diffrence. while SOCCOM , ECOSERV,TRANS,INDUS,EDU , and SERV were stationary at level.

Table 4: Results of stationarity (unit root) test

Variables	ADF value at Differences	Mackinnon Critical Value at 1%	Mackinnon Critical Values at 5%	Mackinnon critical Values at 10%	Order of integration
GDP	-0.153493	-3.5713	-2.9228	-2.5990	stationary at second difference
AGRIC	-0.212411	-3.9228	-2.922449	-2.599224	Stationary at first difference
ADMIN	-0.252135	-3.571310	-2.922291	-2.593224	Stationary at first difference
SOCCOM	-0.084670	-3.571310	-2.92229	-2.593224	Stationary at level
ECOSERV	-0.684849	-3.571310	-2.92229	-2.593224	Stationary at level
TRANS	-1.265278	-3.571310	-2.92229	-2.593224	Stationary at level
INDUS	-0.405246	-3.571310	-2.92229	-2.593224	Stationary at level
EDU	-0.617905	-3.574446	-2.923780	-2.599925	Stationary at level
HEA	-0.281222	-3.577723	-2.925169	-2.600658	Stationary at first difference
SERV	-0.590188	-3.57446	-2.923780	-2.599925	Stationary at level

4.3.2 Cointegration test

The results of cointegration showed trace test indicating 4 cointegrating equations at 5% level and 2 cointegration equations at 1% level. However *(**) denotes rejection of the hypothesis at 5% (1%) level. The result also depicted the order of integration, Thus, some variables were integrated of order 1 (e.g Agriculture) while some were integrated of order 2 (e.g GDP).

Table 5: Cointegration table

Sample(adjusted): 1960 2010
Included observations: 47 after adjusting endpoints
Trend assumption: Linear deterministic trend
Series: GDP AGRIC ADMIN SOCCOM ECOSERV TRANS INDUS EDU HEA SERV
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.778611	287.2555	233.13	247.18
At most 1 **	0.687315	216.3874	192.89	204.95
At most 2 *	0.542403	161.7471	156.00	168.36
At most 3 *	0.520547	125.0041	124.24	133.57
At most 4	0.449999	90.45398	94.15	103.18
At most 5	0.411824	62.35575	68.52	76.07
At most 6	0.389799	37.41146	47.21	54.46
At most 7	0.162062	14.19502	29.68	35.65
At most 8	0.116874	5.884875	15.41	20.04
At most 9	0.000922	0.043355	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 4 cointegrating equation(s) at the 5% level
Trace test indicates 2 cointegrating equation(s) at the 1% level

4.4 Summary of findings

The research work investigated the impact of public sector spending [aggregated and disaggregated analysis] on economic growth in Nigeria economy for the period spanning 1960-2010.
The following findings were inferred from the study:

The results found out that recurrent and capital expenditure contributed positively to economic growth with particular reference to the period under review. The results therefore revealed that capital and recurrent expenditure were significant at 1% level of probability (i.e $P<0.01$).
The results also found that agriculture, social and community services, administration, health and services are significant factors contributing to the growth of the Nigerian Economy but are significant factors ,though expenditure on administration ,social and community services are negatively related to the economic growth. The results of our econometric evidence is also in line with the findings of Muritala and Taiwo (2011).

5.0 Conclusion and Recommendation

5.1 Conclusions

From this research study, it can be concluded that the government recurrent and capital expenditure [aggregated analysis] have significant influence on economic growth in Nigeria. Moreso, the results of disaggregated analysis revealed that agriculture, social and community, and health services were the significant variables in government spending contributing to economic growth in Nigeria. However, it could be adduced that the non significant of some variables like economic services, transfer and education might not be unconnected to the misappropriation of public funds meant for execution of such project(s) being over estimated and often abandoned befor**e** completion.

5.2 Recommendations

Following the results of the study, the following were recommended with a view to enhancing economic growth through public sector spending in Nigeria:
Firstly, government should ensure that capital expenditure and recurrent expenditure are properly managed in a manner that will raise the nation’s productive capacity and accelerate economic growth.
Secondly, government should increase its investment in transport sector, since it would reduce the expenses being incurred on business as well as raise the profitability of firms.
Thirdly, government should encourage the following sectors: education, transfer, economic services, health sectors through increased funding, as well as ensuring that the resources are properly managed.
Lastly, government should increase its funding of anti-graft or anti-corruption agencies like the Economic and Financial Crime Commission (EFCC), the Independent Corrupt Practices Commission (ICPC) as well as total over hauling of our nation’s judicial system in order to bring to book those who diverted and embezzled public funds as practised in the developed countries.

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