PUBLIC EXPENDITURE AND ECONOMIC GROWTH IN NIGERIA: A DISAGGREGATE ANALYSIS

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ABSTRACT

The relationship between public spending and economic growth has been a major source of concern to economists and policy makers; while some find the relationship to be positive, others argue it to be negative. Since most studies carried out an aggregate impact of public spending on economic growth, this study took a step further by examining a disaggregate impact of the components of public spending on economic growth, taking Nigeria as a case study. The Augmented Dickey Fuller (ADF) test for unit root, Johansen Cointegration test, Vector Error Correction Model (VECM) and Impulse Response Function (IRF) were employed for analysis. ADF test result showed variables to be integrated of order one I(1), Johansen Cointegration Trace test and Max-Eigen Value test show variables to be cointegrated i.e. have long run association. Long run relationship result shows a negative and significant impact of Recurrent Transfer Payment (RTR), Capital Socio-Economic Expenditure (CSE) and Openness (OPP) on economic growth, while the negative impact of Recurrent Administration Spending (RAD) was statistically insignificant. Long run result also showed a positive and significant impact of Capital Administration Expenditure (CAD), Investment (INV), and Labour (LAB) on Economic Growth. Short run dynamics of the model showed a positive and significant impact of RAD and OPP on economic growth of Nigeria, while RTR was significantly negative. Other variables were statistically insignificant. The speed of adjustment term showed that about 41 percent correction towards long run equilibrium is completed in a year. Impulse Response Function (IRF) showed the response of GDP to shock in RAD and INV to be positive all through the periods considered, while the response to RTR, CAD, CSE and OPP was negative. The response to shock in LAB was almost zero, though marginally negative. Policy recommendations by the study includes a complete overhaul of the public spending structure of Nigeria by directing more spending towards capital expenditure as against the current pattern of about 70 percent recurrent and 30 percent capital. The government also needs to as a matter of importance block all loopholes and checkmate corrupt practices, while also ensuring that funds are judiciously used for the purposes they were allotted.

Key Words: Public Expenditure, Economic Growth, Nigeria, Disaggregate Analysis.

JEL Classification: H50, H59, E62.

Introduction

It has been consistently argued among economists and other social scientist that government expenditure has the effect of autonomously increasing the income of any country, be it developed or underdeveloped. This idea has been largely influenced by the work or theoretical exposition of John Maynard Keynes (1936) in his book The General Theory of Employment, Interest and Money. Gaurav (2011) sees public expenditure as the expenditure incurred by the public authorities like the central, state and local government of a country to satisfy the collective social wants of the people. Public spending plays a vital role in propelling economic growth, for through it, more funds are channelled into the economy and if that is done, employment is expected to rise so also is income. A rise in income is accompanied by a rise in

aggregate demand and this thus leads to an increase in output, and hence economic growth.Gangal and Gupta (2103) opined that; the predominant objective of public expenditure policy is clearly sustained and equitable economic growth.

Public expenditure in Nigeria has been on the increase in nominal terms year in year out, of the components of public spending, recurrent expenditure accounts for about 77 percent of total expenditure, leaving behind a paltry 23 percent to capital expenditure (Source: CBN Statistical Bulletin, 2014). The huge sum of government spending in Nigeria has not translated into significant growth and development of the country. To buttress this notion, Abu and Abdullahi (2010) noted that; many Nigerians have continued to wallow in abject poverty, while more than 50 percent live on less than US $2 per day, coupled with this is a dilapidated infrastructure that has led to the collapse of many industries, hence causing high level of unemployment.

In light of the foregoing, the study examines the impact of public spending on economic growth by disaggregating the components of public expenditure.

Components of Public Expenditure

Longe (1984) in his analysis of the growth and structure of federal government expenditure classified the features of total government expenditure into two: The recurrent expenditure on one hand and capital expenditure on the other hand. Where recurrent expenditures are expenses made by government in her purchase of current general goods and services, and for day to day running of the government. This includes the purchase of everyday goods such as materials, rents, payment of salaries and wages etc.

Capital expenditure on the other hand is expenses incurred by the government for purpose of increasing future consumption and production. Capital expenditure entails investment spending on capital projects which have long term benefits such as building of bridges, colleges, hospitals etc.

Objective

The objective of the study is to examine the short run and long run impacts of the components of public spending on economic growth of Nigeria.

Empirical Literature

Abu and Abdullahi (2010) asserted that in the Keynesian model, an increase in government expenditure leads to a higher economic growth. Contrary to this, the neo-classical growth models argue that fiscal policy does not have any effect on the growth of natural output. Their finding shows total capital total recurrent and government expenditure on education to have a negative impact on economic growth, while health expenditure, transport and communication expenditure was found to have a positive impact on economic growth.

Usman et al (2011) in their paper titled “Public Expenditure and Economic Growth in Nigeria” employed the Vector Error Correction model. Their Findings indicated the presence of a long run relationship between public expenditure and economic growth of Nigeria.

Laudau (1983) in a cross sectional study of over 100 countries reported evidence of a negative relationship between the growth rate of real GDP per capita and share in government consumption expenditure in GDP. He concluded on an evidence of a negative relationship between growth rate of real GDP and the growth rate of government share in GDP.

Liu et al (2008) in their paper the Association between Government Expenditure and Economic Growth: The Granger causality test of U.S data examined the relationship (causal) between GDP and public expenditure for U.S and came up with an argument that total government

expenditure causes growth of real GDP but on the other hand GDP does not cause expansion of government expenditure.

Devarjan and Vinaya (1993) assessed the link between the level of public expenditure and growth, they derived conditions under which a change in the composition of expenditure leads to a higher steady-state growth rate of the economy.

Erkin (1988) examined the relationship between government expenditure and economic growth, by proposing a new framework for New Zealand. The empirical results showed that higher government expenditure does not hurt consumption, but instead raises private investment that in turn accelerates economic growth.

Mitchell (2005) argued that the American government expenditure has grown too much in the last couple of years and has contributed to the negative growth. The author suggested that government should cut its spending, particularly on projects/programmes that generate least benefits or impose highest costs.

Komain and Brahmasrene (2007) employed the Granger causality test to examine the relationship between government expenditure and economic growth in Thailand and found out that government expenditure and economic growth are not co-integrated. The result also suggested a unidirectional relationship, as causality runs from government expenditure to economic growth. However, the result indicated a significant positive effect of government spending on economic growth.

Rangan and Sharma (2008) showed that government expenditure exerted significant positive impact on economic growth in India during the period 1950-2007, and that the two sets of variables co-integrate.

Data and Methodology

The study adopted the Vector Error Correction Model (VECM) in examining the impacts of public spending on economic growth of Nigeria. The methodology started with unit root testing and when variables were found to be integrated of order one I(1), the Johansen Cointegration test was employed which thus showed that the variables are cointegrated. The VECM was then employed to examine the short run and long run relationship among the variables. Impulse Response Function (IRF) was then used to examine the response of variables to a unit standard deviation innovation/ shock in itself and other variables in the model. Econometric software Eviews8 was used for analysis.

Data Description

S/N	VARIABLE	DESCRIPTION
1	GDP (Real Gross Domestic Product).	Used as a proxy for Economic Growth.
2	RAD (Recurrent Expenditure on Administration)	This refers to spending on general administration, defence, internal security and Legislature.
3	RTR (Recurrent Expenditure on Transfer Payments)	This includes public expenditure on debt servicing, pensions and gratuities, contingencies and CFR charges.
4	CAD (Capital Expenditure on Administration)	This entails public expenditure on administration such as building of government offices, courts, military barracks etc.
5	CES (Capital Expenditure on Social and Economic Services)	Includes capital expenditure on education, health, agriculture, transport and communication etc.
6	INV (Investment)	The proxy used for Investment is Gross Fixed Capital Formation).
7	OPP (Openness)	This is the ratio of imports plus exports to GDP. It is a measure of openness of an economy to international trade.
8	LAB (Labour Force)	This refers to the total able bodied people who are willing and able to work that are within the economically active population.

All data on the variables are annual.

All data on the variables with the exception of labour force were sourced from the CBN Statistical Bulletin 2014, while data on labour force was collected from World Bank Indicators.

Model Specification

The model employed by the study can be specified in Vector Autoregressive Form (VAR) as:

$$Y_t = C + \sum_{i=1}^{k} \prod_i Y_{t-i} + \varepsilon_t \qquad (1)$$

Where: Y_t = Vector of Endogenous Variables.

$$\begin{pmatrix} \text{GDP} \\ \text{RAD} \\ \text{RTR} \\ \text{CAD} \\ \text{CSE} \\ \text{INV} \\ \text{OPP} \\ \text{LAB} \end{pmatrix}$$

C = Vector of Constant terms.
$\prod$ = Coefficient Matrices.
ε_t = Vector of error term.

The long run cointegrating equation is specified as:

$$U_t = GDP - \alpha_0 - \beta_1 RAD - \beta_2 RTR - \beta_3 CAD - \beta_4 CSE - \beta_5 INV - \beta_6 OPP - \beta_7 LAB \quad (2)$$

The Vector Error Correction Model (VECM) is specified as:

$$\Delta Y_t = C + \sum_{i=1}^{k} \Gamma \Delta Y_{t-1} + \gamma(U_{t-1}) + \varepsilon_t \qquad (3)$$

Where C = Vector of Constant terms.
Y_t = Vector of Endogenous Variables.
Γ = Short run coefficient matrices.
γ = Error correction term/ speed of adjustment.
Δ = Short run operator.

U_{t-1} = One lag of long run cointegrating equation.

ε_t = Vector of error term.

Findings and Discussion

Stationarity Test

As a first step under time series analysis, we have to check whether our variables are stationary or not and at what level. To do this, we employed the Augmented Dickey Fuller Test (ADF) and Philips Perron (PP) test for unit root.

Table 1.0 Stationary Test Result.

	ADF TEST				PP TEST				
Variables	Level		First Diff		Level		First Diff		Order
	INT	I & T	INT	I & T	INT	I & T			
GDP	2.81	-1.63	-3.81**	-4.55**	2.71	-1.71	-3.76**	-4.36**	I(1)
RAD	-1.53	1.70	-5.72**	-5.96**	-1.02	-2.56	-8.19**	-9.00**	I(1)
RTR	-0.82	-2.46	-7.69**	-7.62**	-0.71	-2.58	-7.68**	-7.66**	I(1)
CAD	-1.12	-2.97	-9.94**	-9.96**	-0.57	-2.97	-10.23**	-11.58**	I(1)
CSE	-0.55	-2.12	-6.15**	-6.04**	-0.53	-2.32	-6.13**	-6.03**	I(1)
INV	-0.19	-3.43	-3.25*	-4.09*	0.17	-3.43	-4.02**	-3.94*	I(1)
OP	-1.78	-2.15	-7.50**	-7.55**	-1.69	-2.32	-7.62**	-7.54**	I(1)
LAB	1.16	-1.55	-3.95**	-2.77	0.87	-2.01	-4.01**	-4.09*	I(1)

Source: Author's own computation.
H0: Unit Root in series (non-stationary).
*and** indicates rejection of H0 at 5% and 1% respectively.

From the result presented above, both ADF and PP test for unit root shows that all the variables became stationary only after taking their first difference, we can thus conclude that they are integrated of order one I(1).

Cointegration Test

Since all variables are I(1), the next step in the estimation procedure is to check whether or not the variables have long run association or not, this is also referred to as cointegration. To test this, we apply the Johansen Methodology.

Table 2.0 Johansen Cointegration Test Result.

	TRACE TEST		MAX EIGEN VALUE TEST	
Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Max-Eigen Statistic	0.05 Critical Value
None	273.86*	159.53	106.32*	52.36261
At most 1	167.54*	125.62	52.81*	46.23142
At most 2	114.73*	95.75	42.86*	40.07757
At most 3	71.87*	69.82	32.03	33.87687
At most 4	39.84	47.86	22.49	27.58434
At most 5	17.35	29.80	7.62	21.13162

Source: Author's own computation.

From the Johnsen Cointegration test result presented above, we reject the null hypotheses when the test statistic is greater than the 0.05 critical values. As a result, trace test above shows the presence of four (4) cointegrating equations, while max eigen value test shows the presence of three (3) cointegrating equations. We could thus conclude from the foregoing that there exist long run association or relationship among our variables.

Long run Relationship

The normalized estimated long run relationship equation is given by:

GDP= 0.92 - 0.02RAD – 0.05RTR* + 0.09CAD* - 0.10CSE* +0.10INV* - 0.15OPP* + 1.53LAB*
(* indicates statistical significance at 5%)

The estimated equation above shows the long run relationship among the variables. From the result, RAD was found to have an insignificant negative relationship with GDP, while the relationship between RTR and GDP was found to be significantly negative. A percentage change in RTR leads to a 0.05 percentage decrease in GDP. CAD was found to have a significant positive relationship with GDP. A percentage change in CAD leads to a 0.09 percentage increase in GDP. However, the relationship between CSE and GDP was found to be significantly negative. A percentage change in CSE leads to a 0.1 percentage decrease in GDP. INV was found to have a significant

Positive relationship with GDP such that a percentage change in INV leads to a 0.10 percentage increase in GDP. OPP was found to have a significantly negative relationship with GDP such that a percentage change in OPP leads to a 0.15 percentage decrease in GDP. Finally, LAB was found to be significantly positive in its relation to GDP. A percentage change in labour translates to a 1.53 percentage change in GDP.

Vector Error Correction Model (VECM) Representation

The VECM is used to estimate the short run dynamics of the model and also the error correction term or speed of adjustment. The speed of adjustment shows the speed at which the economy converges to equilibrium in a period following a shock in the economy. The results are presented below:

Table 3.0 Vector Error Correction Result.

Variables	Coefficients	T- Statistic
ECT	-0.408	-2.839**
RAD	0.039	2.165**
RTR	-0.044	-1.923*
CAD	-0.012	-0.782
CSE	-0.011	-0.698
INV	-0.021	-0.793
OPP	0.053	2.083**
LAB	-0.303	-0.238
C	0.030	0.917
R SQUARED	0.58	
F-STAT (PROB)	3.20 (0.013)	
LM STAT PROB	0.21	

Source: Author's own computation.
** and * indicates statistical significance at 5% and 10%.

From the result above, the negative and significant value of the error correction term (ECT) further buttress the presence of long run relationship among the variables. The ECT value

shows that about forty one percent (41%) correction towards long run equilibrium is completed in a period of one year. RAD was found to have a significant negative short run relationship with GDP, a percentage change in RAD leads to a 0.04% decrease in GDP. RTR was also found to have a significant negative short run relationship with GDP; a percentage change in RTR causes a 0.044% decrease in GDP. OPP was found to have a significant positive short run relation with GDP, a per cent change in OPP leads to a 0.05% increase in GDP. All other variables are statistically insignificant. R-squared shows that 58% variations in GDP are explained by the independent variables. F-stat and prob shows that the model has an overall significance, while the LM Stat Prob shows the absence of serial correlation in the model.

Residual Diagnostics

Breusch LM Serial correlation test (prob. 0.21) shows absence of serial correlation in the model (see appendix one). Breusch-Pagan-Godfrey Hetroskedasticity test (prob. 0.26) shows the model to be homoscedastic, that is, absence of hetroskedasticity (see appendix two). Jarque Bera Normality test (prob. 0.62) shows residuals to be normally distributed (see appendix three).

Impulse Response Function (IRF)

The IRF shows the response of a variable to a one unit standard deviation innovation or shock in itself and on other endogenous variables in the model. The shocks are channelled through the residuals and the IRF shows how the variables react to such shock into the future period. The IRF's are given below:

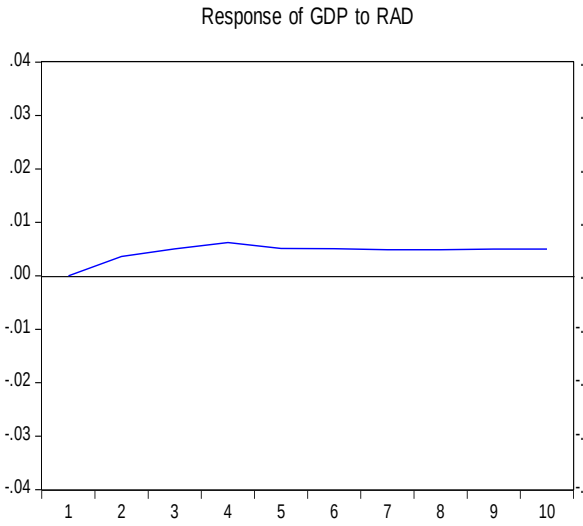

Fig. 1.0 Response of GDP to RAD

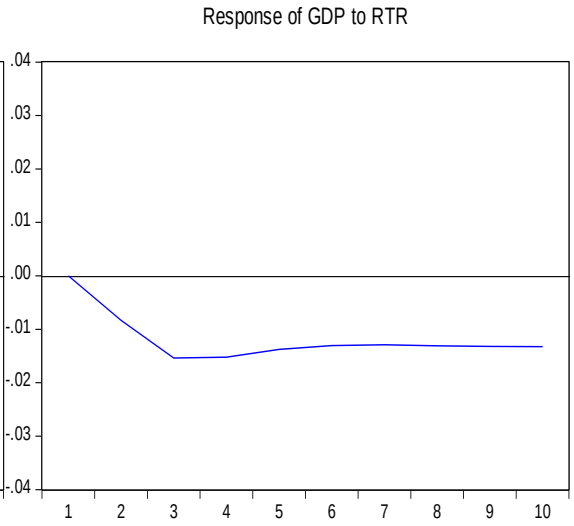

Fig. 2.0 Response of GDP to RTR

The two IRF's above shows the response of GDP to a unit standard innovation/ shock to RAD and RTR. The first graph shows that following a unit shock in RAD, GDP shows no reaction as at the first period, but progressing to the second period up to the fourth period, the response has been an increasing positive response, but after the fourth period, the response though positive declined a little until the end of the tenth period. The response of GDP to shock in RTR was zero in the first period, but after the first period, the response has been negative until the tenth period. This findings show RAD to have a short run positive impact on GDP while RTR is found to have a negative impact on GDP.

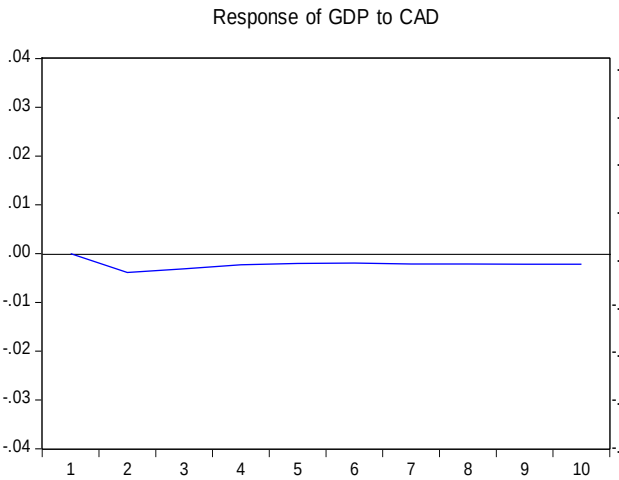

Fig. 3.0 Response of GDP to CAD

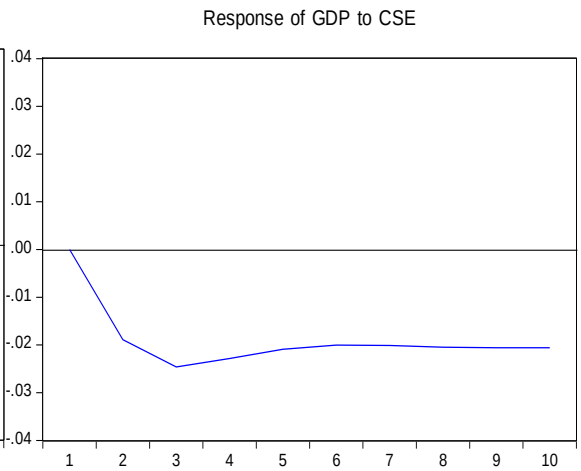

Fig. 4.0 Response of GDP to CSE

The IRF's above shows the impact of GDP to shocks in CAD and CSE. The graph above shows the response of GDP to a shock in CAD to be none in the first period, but gradually moving to the second period; it became marginally negative and reached its trough in the second period and afterwards began to rise though still negative and remained marginally negative until the end of the tenth period. On the other hand, the response of GDP to CSE is a huge negative impact from the first period and onwards, it bottomed out in the third period and remained negative until the tenth period. From the forgoing, both CAD and CSE are found to have a negative short run impact on GDP, though CSE has more impact than CAD.

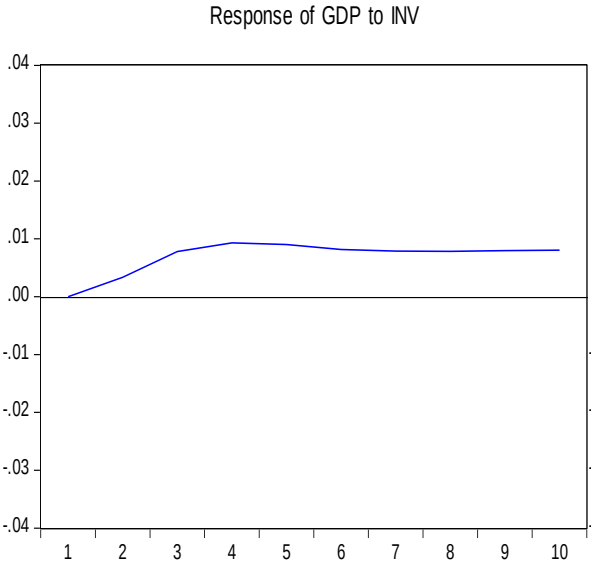

Fig. 5.0 Response of GDP to INV

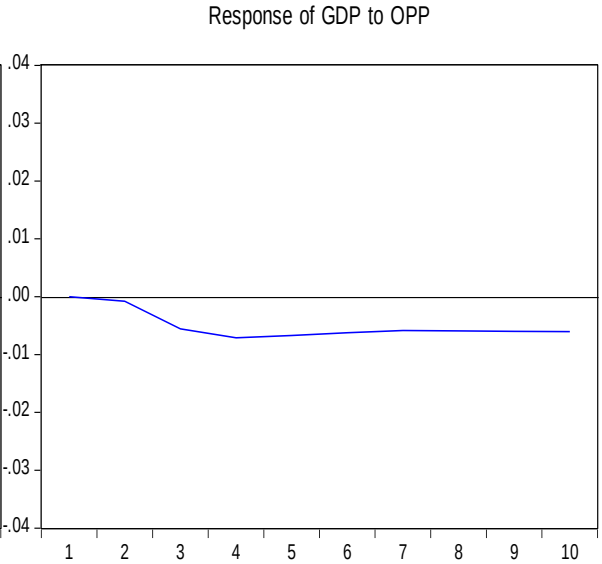

Fig. 6.0 Response of GDP to OPP

The IRF's above shows the response of GDP to shocks in INV and OPP. GDP was found to have an increasing positive response to shock in INV from the first period, it reached its peak around the fourth period and marginally declined though still positively responding to shock in INV until the tenth period. The response of GDP to shocks in OPP was zero through the first and second period; afterwards, it became a negative response up to the tenth period. From the above, we could conclude that INV has a positive impact on GDP, while OPP has a negative short run impact with GDP. The negative short run impact of OPP on GDP can be attributed to the fact that perhaps international trade of Nigeria is skewed towards importation than exportation.

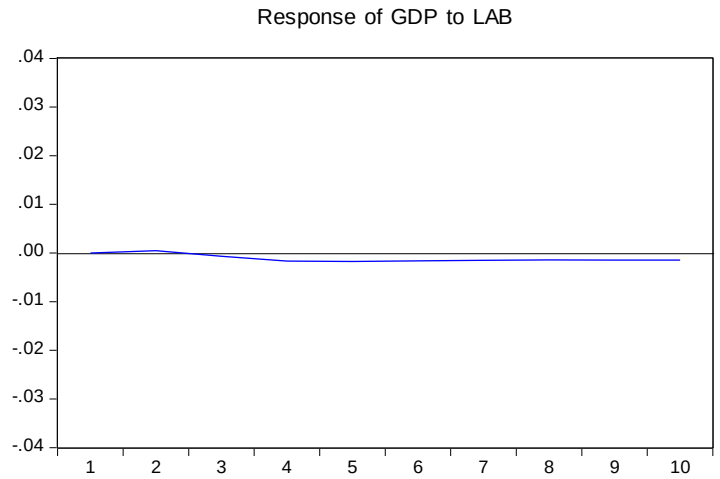

Fig. 7.0 Response of GDP to LAB

The IRF above shows the response of GDP to a unit shock in LAB. From the graph, the response of GDP to shock on LAB was zero in the first period up to the third period, afterwards, it became a thin marginal negative response, almost close to zero up to the end of the tenth period. From the above, we could infer that LAB has almost no significant short run impact on GDP.

Conclusion and Recommendations

The objective of the study was to examine the impact of the components of public spending on economic growth of Nigeria. Findings of the study shows a mixed impact of the components of public spending on GDP, while some were positive, some were negative. In the long run, among the components of public spending included in the study, only capital expenditure on Administration (CAD) was found to have a significant positive relationship with GDP, other components such as RTR, and CSE had a significant relationship with GDP, while RAD was found to have an insignificant long run negative relationship with GDP. Control variables such as INV and LAB had a significant positive relationship with GDP, while OPP has significant negative relationship with GDP. We could infer from the foregoing that most of the expenditure of the government included in the study is inclined towards having a long run negative impact on economic growth of Nigeria.

In the short run, only RAD was found to have a significant positive short run relationship with GDP, while RTR was found to have a significant negative short run relationship with GDP. Among the control variables, OPP was found to have a significant positive relationship with GDP. We could deduce from the above that although RAD was found to have an insignificant relationship with GDP in the long run, in the short run, it affects GDP positively. As for RTR, in both short and long run, it has a negative impact on GDP.

The Policy recommendations thatcan be drawn from the studyinclude a general overhaul of the public expenditure pattern in Nigeria. On the aggregate, most government spending is channelled towards recurrent expenditure and that in itself is bad for it allows a little portion for capital and development spending, the trend needs to change, government needs to as a matter of expediency reverse the trend and make capital expenditure top the table, this is partly due to the fact that all the components of recurrent expenditure included in the study had a negative effect on economic growth of Nigeria. On more specific terms, it was noticed that although Capital Expenditure on Administration (CAD) was found to have a positive impact on economic growth, the other component of capital expenditure i.e. Capital Expenditure on Social and Economic Services (CSE) was found to have a negative effect on economic growth. It is however worrisome that CSE which is expected to have a positive impact on Economic growth is showing a negative impact. We could attribute the reason for this to leakages and corruption. It is possible that although budgeted expenditure for these projects are deducted from the national purse, most of them get siphoned away by corrupt individuals and the funds are not used for the purpose for which they were expended for.

In order to ensure the utilization of public expenditure as a tool of economic growth, the government most as a matter of importance change the trend of spending, more spending should be directed towards capital expenditure. Secondly, the government should block all loopholes and corrupt practices in its expenditure execution; it should also ensure that funds are judiciously used for purposes for which it was budgeted for. This when done will ensure the economic growth of Nigeria.

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Appendix One

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.700225	Prob. F(2,19)	0.2093
Obs*R-squared	4.705885	Prob. Chi-Square(2)	0.0951

Appendix Two

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.426643	Prob. F(16,14)	0.2549
Obs*R-squared	19.21494	Prob. Chi-Square(16)	0.2577
Scaled explained SS	9.740940	Prob. Chi-Square(16)	0.8798

Appendix Three