What Relationship Exists Between Gross Domestic Product and Public Expenditure in Nigeria?

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Abstract— **The purpose of this study is to establish relationship between gross domestic product and public expenditure. Public expenditure was distilled into recurrent expenditure (REX) and capital expenditure (CEX). Data were collected from the Central Bank of Nigeria statistical bulletin from 1987-2013, a period of 27 years. R^2 measured the proportion of the variation in the dependent variable (GDP) that was explained by variations in the independent variables (REX and CEX), 97% of the variation (and not the variance) was explained while 3% was unexplained. Adjusted R^2 measured the proportion of the variance in the dependent variable (GDP) that was explained by variations in the independent variables (REX and CEX), 94% of the variance was explained while 6% was unexplained. The overall significance of the model was assessed by the value in the ANOVA table The result indicated that the model is significant as value of F-value = 165.723 and P-value = .000 which is less than 0.05. The result showed that for 1% increase in REX and CEX, the average or expected change in GDP is 15.6% and 10.3% respectively. The results of the hypotheses tested are: $H_0$1 (p-value =.000 and t-value = 6.469); $H_0$2 (p-value =.011 and t-value = 2.665).The two hypotheses were rejected at 0.01 significant levels.**

Index Terms— public expenditure, gross domestic product, recurrent expenditure, capital expenditure

INTRODUCTION

Public expenditure is spending made by the government of a country, be it central, state and local government of a country on collective needs and wants of her citizens.

Nigeria as a developing country has experienced dynamic changes in the trend of public expenditure policy over years. This is largely due to increase in the activities of government. Also trend of expenditure has been changing as the fiscal unit kept changing in the economic system. Nigeria's economy is dominated by the government with government assuming the role of creating enabling environment within which business can flourish and contribute to the development of the country's economy. Hence government has assumed the role of providing extension services and infrastructural facilities to stimulate investment and augment the productive capacity of the economy

Nigeria Economy

The growth in the Nigerian Economy, as measured by the Real Gross Domestic Products (GDP) in the last five year has been impressive. According to the figure released by the National Bureau of Statistics (NBS), the GDP growth rate stood at 7.43% as at end December 2011. In the last eleven (11) months, the GDP growth rate in Nigeria averaged 7.28% making the Nigerian economy amongst the fastest growing economy in the world despite the infrastructural challenges in the country. The growth was driven principally by the non-oil sector of the economy, whose growth rate stood at 8.80% as at December 2011.

As at Q3 2012, the growth rate in the economy stood at 6.48% as a result of the decline recorded in agriculture, Wholesale and Retail Trade, Crude Oil Production and Natural Gas and Telecommunication and Post sectors of the economy. The slowdown experienced last year was a combination of a number of factors which are: the security challenges in the country which affected farming activities and movement of goods in the Northern part of the country; vandalism, theft and shortage of petroleum products; and the flooding in some parts of the country. Agriculture is the largest sector of the Nigeria economy by GDP, accounting for about 40.19% and 42.62% of the GDP as at December 2011 and September 2012 respectively. This is followed by Wholesale and Retail Trade which contributed 19.37% and 18.81% of the GDP as at December 2011 and September 2012 respectively. The third largest sector is Crude Petroleum and Natural Gas which accounted for 14.80% and 13.42% of the GDP as at December 2011 and September 2012 respectively. The fastest growing sector is Telecommunication and Post whose growth averaged 33.63% in the last 11 months. Although there was a slowdown in the GDP

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growth rate in 2012, we expect the GDP growth rate to accelerate from 2013 through 2017 on account of a number of positive factors in the economy (Nigeria Economic Outlook).

Statement of the problem

The main objective of government expenditure is to better the lots of citizens. A curious look at the government expenditure in recent years makes one to think whether government expenditure has really impacted economic development and growth of nations as it ought to.. In Nigeria and other developing economies, over the years, there has been a steady increase in government spending which has not translated to an appreciable increase in economic growth and development vis-à-vis gross domestic product. In the light of this, researchers have keen interest on the role of government expenditure as it affects growth of gross domestic product both in the short term and in the long term.

It is very unfortunate that rising government expenditure has not translated in corresponding proportion to meaningful growth and development in Nigeria. With increase in government expenditure it is appalling that Nigeria is still ranked among the poorest countries in the world. This has consequentially led to many Nigerians wallowing in abject poverty. This paper will identify the basic relationship between gross domestic product and public expenditure as well as the impact public expenditure has on gross domestic product. The study will therefore serve as good information for fiscal policy managers in Nigeria.

The central question this study intended to answer is what effect does government expenditure have on gross domestic product?

The main proposition of this study is to determine the relationship between gross domestic product and government expenditure. The subsidiary objectives are the following:

(i) to determine the relationship between gross domestic product and recurrent expenditure.

(ii) to investigate the relationship between gross domestic product and capital expenditure.

Statement of Hypotheses

To provide answers to the questions stated above, the central hypothesis is that there is no relationship between gross domestic product (GDP) and government expenditure.

The subsidiary hypotheses are as follows:

$H_0$1: There is no relationship between gross domestic product (GDP) and recurrent expenditure.

$H_0$2: There is no relationship between gross domestic product (GDP) and capital expenditure.

Literature Review

This section is divided into three sections namely; conceptual framework, theoretical framework and empirical survey (extant literature).

Conceptual framework

The role of government as far as the economic development of Nigeria is concerned is depicted by the choice of monetary policy adopted. According to Barro and Grilli, 1994 government expenditure includes all government consumption and investment but excludes transfer payments made by a state. Hence, public expenditure is the expenditure incurred by public authority to satisfy the collective social wants of the people.

Classification of public expenditure

This refers to the systematic arrangement of different items on which the government incurs expenditure. Different economists have looked at public expenditure from different point of view. However, for the purpose of this study, the classification is limited to the following:

(a) Revenue and Capital Expenditure: Revenue expenditure are current or consumption expenditures incurred on civil administration, defence forces, public health, education and maintenance of government machinery. This type of expenditure is of recurring type which is incurred year after year. Capital expenditures on the other hand are for acquisition of goods and services intended to create future benefits such as infrastructure investment. These are non recurring type of expenditure. In the final analysis, this type of expenditure is expected to to improve the productive capacity of the economy.

(b) Hugh Dalton's Classification of Public Expenditure: According to Hugh Dalton, public expenditure is classified as follows:

1) Expenditure on Political Executives: This involves maintenance of ceremonial heads of state, like the president.
2) (Administrative Expenditure: This is to maintain the general administration of the country, like government department and offices.
3) Security Expenditure: This is to maintain armed forces, the police forces and other security agents.
4) Expenditure on the Administration of Justice: This includes maintenance of courts,, judges and public prosecutors.
5) Development Expenditure: This type of expenditure is designed to promote growth and

development of the economy, like expenditure on infrastructure, irrigation, etc

6) Social Expenditure: This is on public health, community welfare, social security.
7) Public Debt Charges: this include payment of interest and repayment of principal amount.

Theoretical Framework

One of the main effects of public expenditure is to increase the quantity and/or quality of public goods and services. The private sector will typically not supply public goods and services because they cannot charge a price for their uses. Therefore such goods are provided by the government, through its ability to raise revenues from domestic taxation or foreign aid. In this case, the amount of the good or service which is provided, and which any one firm or household can use is in effect rationed. Nevertheless, additional investment can increase the quantity and/or quality of this rationed amount, benefiting households and firms in the process. To analyze the 'quantity' effects of public expenditure on firms, we will again assume that public and private capital are complements. However, we now assume that from the point of view of any one individual firm, the supply of public capital is effectively fixed, whereas the amount of labour, capital and other inputs used is under the firm's control. We can then express the profit function of any one individual firm as

Theoretical framework

The classical theorists as well as the ancient jurists did not favour the expansion of the public sector requiring heavy doses of public expenditure. They defined the activities of government on the basis of the traditional functions. The functions of modern day government, however, has increased; necessitating drastic shift into modern welfare state.

From the foregoing, this new philosophy of state and its functions have pushed the level of state activities in all direction translating into expansion of the public sector coupled with consequent growth in public sector.

Wagner's Hypothesis

Wagner is an economist from Germany who wrote at the tail end of nineteenth century. In his writing he propounded the law of increasing expansion of public and particularly state activities which was referred to as the law of 'increasing expansion of fiscal requirements'. He predicted that there is a causal effect between state activities and growth of public expenditure. Wagner further argued that social progress brought increasing state activities in return meant more public expenditure. According to Wagner hypothesis of increasing state activities, public expenditure can be divided into two namely: (i) expenditure for internal , external security and (ii) culture and welfare.

Peacock-Wiseman Hypothesis

Peacock and Wiseman,1967 considered the role of emergency such as war, as reason for raising the level of public expenditure. The duo developed the hypothesis that expenditure grows because revenue grows rather than the other way. In normal time, size of public expenditure is limited by the level of taxation which the general public is prepared to tolerate, but this tolerable level cannot be high. However, during the period of disturbance, for instance during the time of war; this tolerable limit changes. Once the war is over, the tax ratio does not return to the pre-war level. Hence, there is upward movement of revenue and expenditure permanently. This movement is called 'displacement effect'.

Leviathan theory

The third theory that explains government expenditure is the Leviathan theory. This theory proposes that the aggregate government's intervention in the economy will be reduced as the taxes and expenditures are reduced, ceteris paribus. Rodden (2003) asserts that the Leviathan theory emanates from the fact that the central government is viewed as a 'revenue maximising leviathan' that seeks to maximize her revenue by fiscal decentralisation of the central government monopoly on taxation. This theory maintains that the more decentralised the central government, the lower the government spending in the economy because the decentralized unit will be responsible for revenue generation and expenditure disbursement. By this, the pressure on the central government reduces and it is transferred to the sub-units.

Summary of Extant Literature

Name of Author	Date	Title of Journal	Findings
Laudau, D.	1983	Government expenditure and economic growth	There is a negative effect of government expenditure on growth of real output.
Barro, R.	1990	Government spending in a simple model of endogenous growth	Expenditure on investment and productive activities contribute positively to economic growth.
Devarajan, S. ; Swaroop,	1996	The composition of public	The nature, size and direction of

V. & Zou, H.		expenditure and economic growth	government spending determine its impact on the economy.
Akpan, N.	2005	Government expenditure and economic growth in Nigeria	That there is negative non significant impact of government expenditure on economic growth.
Koman,J.& Brahmasrene, T.	2007	The relationship between government expenditure and economic growth in Thailand.	There is positive significant impact of government spending on economic growth.
Aregbeyen, O	2007	Public expenditure and economic growth	There is positive and significant correlation between government capital and public investment and economic growth
Modebe, N. J. ; Regina,G. O; Onwumere, J. U. J; & Imo, G. Ibe.	2012	Impact of recurrent and capital expenditure on Nigerian's economic growth.	Recurrent expenditure had positive and non significant impact on economic growth, capital expenditure had negative and non significant impact on economic growth.

Methodology

The study adopted ex-post facto (cause and effect) research design. Primary method of data collection was used. Data were collected from the Central Bank of Nigeria Statistical Bullet for twenty seven years from 1987 to2013. Three variables considered in this study were gross domestic product (GDP), revenue expenditure (REX) and capital expenditure (CEX) to show the relationship between GDP, REX and CEX and the impact of REX and CEX on GDP using Product moment coefficient of correlation and multiple regression analysis (Owolabi, S. A. & Alayemi, S. A. 2012; Alayemi, S. A., 2013 and Nworji, I.D. & Alayemi, S.A.,2014).

Model specification

The relation between gross domestic product, current expenditure and capital expenditure is shown below:

$$\mathbf{GDP = \beta_0 + \beta 1REX + \beta_2 CEX + \varepsilon}$$

Where:

β_0 is the intercept of the model. It is the level of gross domestic product that the nation can produce when recurrent expenditure and capital expenditure are considered irrelevant. β_i (I =1,2) are the coefficients of the respective components of public expenditure. ε is stochastic variable introduced into the model to accommodate the influence influences of other variables that may influence gross domestic product but which are not explicitly included in the model.

Data Analysis

Correlation Analysis

Before regression analysis is considered, it is highly important to check the relationship (correlation) between different variables on which the analysis was built. Correlation explains how two variables react to each other. From table 1, it is shown there is positive correlation (relationship) between GDP and REX as well as between GDP and CEX at 0.01 significant level. The implication of this is that the null hypotheses 1and 2 were rejected showing existence of relationship between GDP and REX and between GDP and CEX. Furthermore, the correlation showed the impact of the relationship is significant.

Table 1: Product Moment Coefficient of Correlations

		GDP	REX	CEX
GDP	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	27		
REX	Pearson Correlation	.966**	1	*

	Sig. (2-tailed)	.000		
	N	27	27	
	Pearson Correlation	.906**	.898**	1
CEX	Sig. (2-tailed)	.000	.000	
	N	27	27	27

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

Source: Researcher Computation

Regression Analysis

The weakness of Product moment coefficient of correlation is that they do not differentiate between causes from consequences. From the foregoing, to overcome this weakness, regression analysis was employed to investigate the impact of REX and CEX on GDP. The results were as presented below in tables 2, 3 and 4. For the purpose of emphasis, the model was recalled:

$GDP = \beta_0 + \beta 1REX + \beta_2 CEX + \varepsilon$

Table 2 is the model summary. R-square measured the proportion of the variation in the dependent variable (GDP) that was explained by variations in the independent variables (REX and CEX). In this study, 94% of the variation (and not the variance) was explained while 6% was unexplained. Adjusted R-square measured the proportion of the variance in the dependent variable (GDP) that was explained by variations in the independent variables (REX and CEX). In this case it was revealed that 93.5% of the variance was explained while 6.5% was unexplained.

The overall significance of the model was assessed by the value in the ANOVA table shown in table 3. The model indicated that the model is significant as shown in the value of F- value of 165.7 and a p- value of .000 which is less than 0.05.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.970[a]	.940	.935	44582.01154

a. Predictors: (Constant), CEX, REX
Researcher Computation

Table 3: ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	658765832294.524	2	329382916147.262	165.723	.000[b]
Residual	41738670817.395	24	1987555753.209		
Total	700504503111.919	25			

a. Dependent Variable: GDP
b. Predictors: (Constant), CEX, REX
Researcher Computation

The Unstandardized Beta Coefficients of the variables shown in table 4 indicated that all predictor variables made contributions to the variation in the dependent variable, however, at varying degree. This is shown in the result of the model below.

$GDP = 254236.13 + .156REX + .103CEX + \varepsilon$

The result shown above indicated that in the absence of public expenditure, the GDP could still be 254236. This may not appeal to common sense. The implication is that; apart from recurrent expenditure and capital expenditure, there are other economic variables that are driving gross domestic product.

There is positive effect of REX and CEX on GDP which is significant. This means that as REX and CEX increases there will also be increase in GDP ceteris baribus. This is an indication that public expenditure has impact on GDP. In addition, the result showed that for 1% increase in REX and CEX, the average or expected change in GDP is 15.6% and 10.3% respectively.

Table 4: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	254236.133	13139.714		19.349	.000
REX	.156	.024	.784	6.469	.000
CEX	.103	.062	.202	2.665	.011

a. Dependent Variable: VAR00001

Source: Researcher Computation

Testing of Hypothesis

The information in table 4 was used to test the hypothesis formulated above.

Table 5: Hypotheses Testing

Model	Coefficient	t-statistics	Sig.Level	Hypothese	Decision
REX	.784	6.469	.000	$H_0 1$	Do not reject
CEX	.202	2.665	.011	$H_0 2$	Do not reject

Source: Table 4

The result of the hypotheses showed that hypotheses 1 and 2 were rejected indicating that there is significant relationship between GDP, REX and CEX.

Conclusion and Recommendation

Nigeria economy being a mixed economy is characterized by a dominant public sector supplemented by an equally competitive private sector. The paper has revealed that public expenditure plays a significant and to a certain extent, a unique role. Government expenditure is on the increase in recent years as a result of increase in government activities occasioned by innovation in technologies. Therefore, government expenditure should be freed from to deal with many day-to-day activities to secure a reallocation of resources, redistribution activities, stabilizing activities and commercial activities. The need to improve security to provide the enabling environment for economic growth appears to be one of the reasons for the increase in the security allocation. The strategy would be to curb the unrest in the North and consolidate on the peace in the Niger-Delta post-amnesty. Another issue for the government to consider is disaster preparedness to deal with natural disasters such as the recent flooding in various parts of the country.

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