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GOVERNMENT SPENDING AND ECONOMIC GROWTH DYNAMICS IN NIGERIA: A TIME SERIES ANALYSIS

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ABSTRACT

This study examines the link between government spending and economic growth in Nigeria over the last three decades (1977-2006) using time series data to analyze the Ram (1986) model. Three variants of Ram (1986) model were developed-regressing Real GDP on Private investment, Human capital investment, Government investment and Consumption spending at absolute levels, regressing it as a share of real output and regressing the growth rate real output to the explanatory variable as share of real GDP, in other to capture the precise link between public investment spending and economic growth in Nigeria based on different levels.

Empirical result showed that private and public investments have insignificant effect on economic growth during the period under review. The paper test for presence of stationary using Augmented Dickey Fuller (ADF) unit root test result reveals that all variables incorporated in the model were non-stationary at their levels. In an attempt to establish long-run relationship between public expenditure and economic growth, the result reveals that the variables are cointegrated at 5% and 10% critical level. With the use of error correction model to detect short run behaviour of the variables, the result shows that for any distortion in the short-run, the error term restore the relationship back to its original equilibrium by a unit. The paper main policy recommendation was that government spending should be channel in order to influence economic growth significantly and positively in Nigeria especially on education and infrastructural facilities.

KEY WORDS: *Government spending, public infrastructure, economic growth, human capital investment, Government investment.*

Jel Classification: *E2, H50, H 51, H 52, H54*

BACKGROUND TO THE STUDY

The recent revival of interest in growth theory has also revived interest among researchers in verifying and understanding the linkages between government spending and economic growth especially in developing country like Nigeria.

Over the past decades, the public sector spending has been increasing in geometric term through government various activities and interactions with its Ministries, Departments and Agencies (MDA's), (Niloy et al. 2003). Although, the general view is that public expenditure either recurrent or capital expenditure, notably on social and economic infrastructure can be growth-enhancing although the financing of such expenditure to provide essential infrastructural facilities-including transport, electricity, telecommunications, water and sanitation, waste disposal, education and health-can be growth-retarding (for example, the negative effect associated with taxation and excessive debt)

The size and structure of public expenditure will determine the pattern and form of growth in output of the economy. The structure of Nigerian public expenditure can broadly be categorized into capital and recurrent expenditure. The recurrent expenditure are government expenses on administration such as wages, salaries, interest on loans, maintenance etc., whereas expenses on capital projects like roads, airports, education, telecommunication, electricity generation etc., are referred to as capital expenditure. One of the main purpose of government spending is to provide infrastructural facilities and the maintenance of these facilities requires a substantial amount of spending. The relationship between government spending on public infrastructure and economic growth tends to be an important analysis in developing countries, most of which have experienced increasing levels of public expenditure overtime (World Development Report, 1994). Expenditure on infrastructure investment and productive activities (in State-Owned Enterprises) ought to contribute positively to growth, whereas government consumption spending is anticipated to be growth-retarding (Josaphat and Oliver, 2000).

However, economies in transition do spend heavily on physical infrastructure 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; Deverajan et al., 1993; Nitoy et al., 2003) have found that there exists positive correlation between economic growth and public spending on infrastructural facilities. Manufacturing industries do consider infrastructure services or facilities before locating their production base in order to gain large economies of scale and reduce cost of production. Also, to increase total industrial output at a cheaper price in the economy.

Following the World Bank's Development Report (1994), developing countries invest $200billion a year in new infrastructure representing 4 percent of their national output and a fifth of their total investment. The result has been a dramatic increase in infrastructure services-for transport, power, water, sanitation, telecommunications, and irrigation. The provision of infrastructure services to meet the demands of business, households, and other users is on of the major challenges of economic development in developing countries like Nigeria.

The objective of the study is to investigate the link between government

spending on and economic growth in Nigeria. The remaining part of this study is divided into four sections. Section II deals with literature, theoretical and empirical review. Section III highlights the methodological issues, section IV presents and analyses the result while section Vconcludes and proffer policy recommendations.

2.0 LITERATURE AND EMPIRICAL REVIEW

2.1 Government Spending and Economic Growth: -

In a developed country, through economic stabilization, stimulation of investment activity and so on, public expenditure maintains a rate of growth which is a smooth one. In an underdeveloped country, public expenditure has an active role to play in reducing regional disparities, developing social overheads, creation of infrastructure of economic growth in the form of transport and communication facilities, education and training ,growth of capital goods industries, basic and key industries, research and development and so on (Bhatia, 2002). Public expenditure on infrastructural facilities has a great role to play in the form of stimulating the economy.

The mechanism in which government spending on public infrastructure is expected to affect the pace of economic growth depend largely upon the precise form and size of total public expenditure allocated to economic and social development projects in the economy. When public expenditure is incurred, by itself it may be directed to particular investments or may be able to bring about re-allocation of the investible resources in the private sector of the economy. This effect, therefore, is basically in the nature of re-allocation of resources from less to more desirable lines of investment. An important way in which public expenditure can accelerate the pace of economic growth is by narrowing down the difference between social and private marginal productivity of certain investments. Here, public expenditure on social and economic infrastructural like education, health, transport, communication, water disposal, electricity, water and sanitation etc., has the potential of contributing to the performance of the economy based on Promotion of infant industries in the economy; Reduction in the unemployment rate; Stabilization of the general prices in the economy; Reduction in the poverty rate and increase the standard of living of the people; Promotes economic growth by attracting foreign investment; and Promotes higher productivity.

In tracing the work of Rosto and Musgrave, where they put forward development model under the causes for growth in public expenditure. Under this model, public expenditure is a prerequisite of economic development. The public sector initially provides economic infrastructure such as roads, railways, water supply and sanitation. As economic growth take place, the balance of public investment shift towards human capital development through increase spending on education, health and welfare services. In this model, the state is assumed to grow like an organism making decision on unbehalf of the citizens. Society demand for infrastructural facilities such as education, health, electricity, transport etc., grow faster than per capita income. In other word, as the economy grows the demand for infrastructural facilities also increase for commensurate development in the economy this is as result of the following:

- Many societies are experiencing a growing population which becomes a major contributory factor in the growth

of public expenditure. The sheer scale of state services has to increase to keep pace with population growth, including, for example, more schools, hospitals, and police etc.

- Most countries have registered increasing urbanization. Existing cities grow and new ones come up. Urbanization implies a much larger per capita expenditure on civic amenities. It necessitates a much larger supply of incidental services like those connected with traffic, roads, schools etc.
- Implementation of special economic plan necessitates increase in government spending like the implementation of Structural Adjustment Programme (SAP) in 1986 which caused a sharp increase in public expenditure in Nigeria.

2.2 EMPIRICAL REVIEW

Numerous studies have been conducted to investigate the relationship between government spending and economic growth. Landau (1983) found that the share of government consumption to GDP reduced economic growth which was consistent with the pro-market view that the growth in government constrains overall economic growth. The conclusions were germane to growth in per capita output and do not necessarily speak to increase in economic welfare. Economic growth was also found to be positively related to total investment in education. In a later study, Landua (1986), extends the analysis to include human and physical capital, political, international conditions as well as a three year lag on government spending in GDP. Government spending was disaggregated to include investment, transfers, education, defense and other government consumption. The results in part mirrored the earlier studies in that general government consumption was significant and had a negative influence on growth. Education spending was positive but not significant. It was unclear why lagged variables were included given that the channels through which government influence growth suggest a contemporaneous relationship.Ram (1986) study marked a rigorous attempt to incorporate a theoretical basis for tracing the impacts of government expenditure to growth through the use of production functions specified for both public and private sectors. The data spanned 115 countries to derive broad generalizations for the market economics investigated. He found government expenditure to have significant positive externality effects on growth particular in the developing countries (LDC) sample, but total government spending had a negative effect on growth. Lin (1994) used a sample of 62 countries (1960-85) and found that non-productive spending had no effect in growth in the advanced countries but a positive impact in LDCs. Other studies have investigated the impact of particular (functional) categories of public expenditure. For example, Deverajan et al (1993), using a sample of 14 OECD countries, found that spending on health, transport and communication have positive impacts whereas spending on education and defence did not have a positive impact. In the majority of studies, total government spending appears to have negative effect on growth (Romer, 1990; Alexander; 1990; Folster and Henrekson; 1999).Seymour *et al.* (1997), used a disaggregated approach to examine the impact of government expenditure on economic growth in the OECD. Their study is similar to Cashin (1995) but it opens new grounds by focusing on the short to medium term impact of fiscal policy and incorporates the distortionary effects of government activities using four regression models and a fixed effect

model with a least square dummy variable (LSDV) model. They found that all the regressors had the correctsigns including capital which along with housing, roads, education were insignificant. The non-linear term for education was highly significant and positive corroborate the endogenous growth literature contention that human capital yields increasing returns to scale and nonlinearity in production. The nonlinear term of health was found significant also but was negative implying that health expenditure can be distortionary.Josaphat *et al.* (2000), investigated the impact of government spending on economic growth in Tanzania (1965-1996) using time series data for 32years. They formulated a 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 relates positively to growth, and which in particular appears to be associated with increased private consumption. The results revealed that expenditure on human capital investment was insignificant in their regression and confirm the view that public investment in Tanzania has not been productive, as at when the research was conducted. Nitoy *et al.* (2003) employed the same disaggregated approach as followed by Josaphat *et al.* (2000). They examined the growth effects of government expenditure for a panel of thirty developing countries (including Nigeria) over the decades of the 1970s and 1980s, with a particular focus on sectoral expenditures. The primary 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 at sectoral level revealed that government investment and total expenditures on education are the only outlays that remain significantly associated with growth throughout the analysis. Although public investments and expenditures in other sectors (transport and communication, defense) was found initially to have significant associations with growth, but do not survive when government budget constraint and other sectoral expenditures 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. Junko and Vitali (IMF, 2008) investigate the impact of government expenditure on economic growth in Azerbaijan because of the temporarily oil production boom (2005-07), which caused expectationally large expenditure increase aimed at improving infrastructure and raising incomes. Azerbaijan's total expenditure increased by a cumulative 160 percent in nominal value from 2005 to 2007 (i.e. from 41 percent of non-oil GDP to 74 percent). In their research reference were made to Nigeria and Saudi Arabia (1970-89) who have also experienced oil boom and increased government expenditure over the years. The study simulated the neo-classical growth model tailored to the Azeri conditions. Their analysis suggested that the evaluated fiscal scenario poses significant risks to growth sustainability and historical experience indicates that the initial growth performance largely depends on the efficiency of scale-up expenditure. The study also sheds light on the risks associated with a sudden scaling-down of expenditure, including the political difficulties to undertake an orderly expenditure reduction strategy without undermining economic growth and the crowding-out effects of large government domestic borrowing.

3.0 METHODOLOGICAL ISSUES

3.1 Apriori Expectation: -

Public expenditure on infrastructure investment and productive activities-like electricity, telecommunication, health, education, transport, water, sanitation and irrigation are expected to contribute positively to economic growth, whereas government consumption spending is anticipated to be growth retarding. Therefore, public expenditure on social and economic infrastructure is theoretically expected to have positive impact on economic growth. Also, private investment is expected to have positive impact on economic growth. This can be represented mathematically as follows:

$$\frac{dY}{dI_P} > 0, \frac{dY}{dI_G} > 0, \frac{dY}{dH_G} > 0, and \ \frac{dY}{dC_G} < 0 \qquad (3.11)$$

4.0 PRESENTATION AND INTERPRETATION OF RESULT

4.1 REGRESSION: ABSOLUTE

Econometric Method: OLS
Period of study: 1977 – 2006
Observation: 30
Dependent variable: Real GDP (Y)

Variable	Co-efficient	Std. Error	T-statistic	Prob.
Constant	195248.5	24239.163	8.055	0.000
PRI INVT (I_P)	0.924	0.589	1.569	0.129
GOV INVT (I_P)	0.134	0.260	0.514	0.612
HUM INVT (H_g)	-1.474	1.208	-1.221	0.234
GOVCOM(C_g)	0.306	0.213	1.435	0.164
R^2 = 0.676		**Adjusted R^2 = 0.624**		
F = calculated = 13.025		**F-tab = $F_{0.05,4,25}$ = 2.76**		
Durbin-Watson = 0.523				

Source: Extracted from E-Views 5.1 Output

The specified model is

$$Y = b_0 + b_1 I_P + b_2 I_g + b_3 H_g + b_4 C_g + U$$

Using the absolute values of all the variables, the estimated model is:

$$Y = 195248.5 + 0.924\ I_P + 0.134\ I_g - 1.474\ H_g + 0.306\ C_g$$

The estimated model shows that there exist positive relationship between Real GDP and the explanatory variables – private investment, government investment spending and government consumption spending. This is in conformity with the theoretical expectation excluding government consumption spending which is expected to be growth retarding. Also, human capital investment is found to have negative relationship with real GDP contrary to a priori.

The estimated regression reveal that a unit change in private investment (I_p), government investment spending (I_g) and government consumption spending (C_g) will enhance real GDP by values of 0.924, 0.134 and 0.306 respectively. Likewise, one present change in human capital investment will retard growth by 1.474.The t-statistic is used to test for individual significance of the estimated parameters (b_1, b_2, b_3 and b_4). The result reveals that all the parameters are not significant, because their t-calculated is less than

t-tabulated (2.04). Then, the null hypothesis is accepted. The F-statistic is used to test for simultaneous significance of all the estimated parameters and the result showed that they are all simultaneously significant. It's because the F-calculated (13.025) is greater than F-tabulated (2.74). The Durbin–Watson test shows that there is presence of positive serial correlation in the residuals, because the d-value (0.523) is greater than zero but less than two.

The econometric analysis of the link between public expenditure and economic growth in Nigeria during the review period have shown that private investment, government investment spending, and government consumption spending have positive impact on economic growth but the effect is insignificant. Also, the negative effect of human capital investment on real GDP is not significant. Therefore, their parameters are statistically assumed to be zero. In conclusion, the null hypothesis is accepted which implies that government spending has no significant impact on economic growth in Nigeria during the review period.

5.0 POLICY RECOMMENDATIONS

Emanating from the result, for private investment and various components of government expenditure like human capital investment, government consumption and investment spending to have significant impact on economic growth, the following policy options are recommended:

1. Government should monitor the contract awarding process of capital projects closely, to prevent against over estimation of execution cost. This will bring about significant impact of public investment spending on economic growth.

2. There should be effective channeling of public fund to productive activities, which will have a significant impact on economic growth.

3. There should be joint partnership between the government and the private sector in providing essential infrastructural services that will promote economic growth and development.

4. The government consumption spending should be well coordinated by all arms of government to prevent "crowd out" effect on government investment.

5. There should be high degree of transparency and accountability on government spending at various sectors of the economy in order to prevent channeling of public funds to private accounts of government officials.

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