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A Dynamic Analysis of the Effects of Changes in Government Spending on Output in Nigeria

Onoja, Joan Egbe
Department of Economics
College of Education, Ekiadolor-Benin
Benin-City, Edo State, Nigeria

Abstract

This paper examined the dynamic effect of government spending on output in Nigeria using an Error Correction framework.The study seeks to investigate both the short-run and long-run (stability) effects of changes in government spending on aggregate output. The analysis will show the impetus for the inherent stabilization (or destabilization) capacity of government spending in the long-run in Nigeria.

Introduction

The relationship between government spending and economic growth has continued to generate series of debate among scholars. Government performs two functions, protection (and security) and provisions of certain public goods (Abdullah, 2000). Protection function consists of the creation of the rule of law and enforcement of property rights. This helps to minimize risks of criminality, protect life and property and the nation from external aggression. Under the provisions of public

goods are defense, roads, education, health and power, to mention but a few. Some scholars argue that increase in government expenditure on socio- economic and physical infrastructures encourages economic growth. For example, government expenditure on health and education raises the productivity of labour and increase the growth of national output. Similarly, expenditure on infrastructures such as roads, communications, power, e.t.c reduces production costs, increases private sector investments and profitability of firms, thus fostering economic growth. Supporting this view, scholars such as Sharma (2008) and Cooray (2009) concluded that expansion of government expenditure contributes positively to economic growth

Moreover, some scholars do not support the claims that increasing government spending promotes, economic growth, instead they assert that higher government expenditure may slowdown overall performance of the economy. For instance in an attempt to finance rising expenditure, government may increase taxes and/or borrowing. Higher income tax discourages individuals from working for long hours or even searching for jobs. This in turn 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. Moreover, if Government increases borrowing (especially from the banks) in order to finance its expenditure, it will compete (crowds-out) away the private sector, thus reducing private investment. Thus, government activity sometimes produces misallocation of resources and impedes the growth of national output, Barro (1991).

In Nigeria, government spending has continued to rise due to the huge receipts from production and sales of crude oil, and the increased demand for public (utilities) goods like roads, communication, power, education and health. Available statistics show that total government expenditure (capital and recurrent) and its components have continued to rise in the last three decades. Unfortunately, as was emphatically noted by Nurudeen and Usman (2010), "rising government expenditure has not translated to meaningful growth and development. Nigeria still ranks among the poorest countries in the world. Coupled with this, is dilapidated infrastructure (especially roads and power supply) has led to the collapse of many industries, including high level of unemployment. Moreover, macroeconomics indicators like balance of payments, import obligations, inflation rate, exchange rate and national savings reveal that Nigeria has not fared well in the last couple of years."

Literature Review

According to the Keynesian macroeconomic thought, public spending can contribute positively to economic growth. Hence, an increase in government consumption is likely to lead to an increase in employment, profitability and investment through multiplier effects on aggregate demand. As a result, government spending augments the aggregate demand, which provokes an increased output

depending on expenditure multipliers. The opponents of this approach stipulate that government consumption crowds out private investment, hampers economic growth in the short-run and diminishes capital accumulation in the long-run (Diamond, 1989).

The conventional wisdom behind this is based on the neo-classical theory of output and employment, which has two variants – the extreme and the moderate versions. The extreme version assumes the economy to be continuously at the level of output corresponding to full employment. An increase in government spending financed by borrowing leads to a rise in interest rates, higher interest rates lower private investment, thereby lowering output growth. The moderate version of the neo-classical theory (Blinder and Solow, 1973) allows that unemployment may exist in the short-run so that fiscal policy, specifically budget deficits, may have a positive impact on output; an increase in government expenditure, or a decrease in the tax rate, stimulates spending, output and employment. However, once full employment has been achieved, the simulative effect of the government deficit becomes inflationary.

Momoud (1999) divided government spending into two types: consumption spending (expenditures on goods and services) and public investments spending (expenditures on infrastructure, education, public health research and development, and other expenditures that are conducive to raising business productivity). Also, Barro and Sala-Martin (1992) classify expenditures as productive and unproductive and assume that productive expenditures have a direct impact on the rate of economic growth and the unproductive expenditures have an indirect or no effect. However, government spending on basic infrastructure plays a crucial role in economic growth. Having, for instance, an efficient road network could reduce the time and the cost to move goods and services across the country. It also facilitates the connection among the different parts of the country and enhances their interaction. In addition, the rehabilitation of electricity and the establishment of efficient project for energy will reduce costs and have positive impact on economic growth.

Many researchers have attempted to examine the effect of government expenditure on economic growth. Wray (1999) used the classical growth cycle (CGC) model to estimate three major implications for the scope and effects of government spending. First, a fixation on arbitrarily restrictive fiscal targets will not necessarily yield any long run benefits and in fact can lead to a collapse of demand over the course of the business cycle. Second, government spending in the excess of government revenues can play a positive role in the long run even if productive capacity is fully utilized. In the event of an economic slowdown in the short to medium run, spending limits will have deleterious economic and social consequences. Third, the various beneficial supply side effects of government policy can improve industrial competitiveness.

Blanchard and Perotti (1999) characterized the dynamic effects of shocks in government spending and taxes on economic activity in the United States in the post war period. They did so by using a mixed structural VAR/event study approach. Identification was achieved by using institutional information about the tax and transfer systems and the timing of tax collections to identify the automatic responses of taxes and spending to activity, and, by implication, to infer fiscal shocks. The results consistently showed positive government spending shocks as having a positive effect on output and positive tax shocks as having a negative effect.

Komain and Brahmasrene (2007) examined the association between government expenditures and economic growth in Thailand, by employing the Granger causality test. The results revealed that government expenditures and economic growth are not co-integrated. The result also indicated a unidirectional relationship, as causality runs from government expenditures to growth.

In Nigeria, many authors have also attempted to examine government expenditure-economic growth relationship. For example, Fajingbesi (1999) empirically investigated the relationship between government expenditure and economic growth in Nigeria. The econometric results indicated that real government capital expenditure has a significant positive influence on real output. However, the results showed that real government recurrent expenditure affects growths only by little. Also, study of Ogiogio (1995) revealed a long term relationship between government expenditure and economic growth. Moreover the author's finding showed that recurrent expenditure exerts more influence than capital expenditure on growth. Akpan (2005) used a disaggregated approach to determine the components (that include capital, recurrent, administrative, economic service, social and community service, and transfers) of government expenditure that enhance growth and those that do not. The author concluded that there was no significant association between most components of government expenditure and economic growth in Nigeria. Finally, Nurudeen and usman (2010) did a study on government expenditure and economic growth in Nigeria and found that government total capital expenditure, total recurrent expenditures and government expenditure on education have negative effect on economic growth. On the contrary, rising government expenditure on transport, communication and health brings about economic growth.

Methodology

This paper uses the co-integration and error correction methods to analyze the relationship between changes in government spending and output growth. The framework for the study has its basis on the Keynesian and endogenous growth models. The Keynesian model states that expansion of government expenditure accelerates economic growth. Although, endogenous growth models do not assign any important role to government in the growth process, authors like Barro (1990)

and Rebelo (1993) emphasized the importance of government (activity) policy in economic growth. From the foregoing discussion, the level of government spending and composition of government expenditure are important determinants of growth. Thus, our model expresses aggregate output (proxied by real GDP I.E. RGDP) as a function of government expenditure (GOVEXP), inflation (iNFL) and aggregate investment (INV), since they can have lasting impact on economic growth.

Thus, the model is specified as:

$$\Delta RGDP_1 = \phi_0 + \phi_1 \Delta GOVEXP + \phi_2 \Delta INFL_1 + \phi_3 \Delta INV_1 + \beta_1 InGDP_{i-1} + \gamma ECM_{i-1} + \pounds_1$$

Where $\phi_1 , \phi_2, \phi_5 > 0; \phi_3 , \phi_4, < 0$

ECM = Error Correction Term

$\pounds_1$ = Stochastic Disturbance Term

With the specified equation, we intend to ascertain whether a long-run relationship exist between output, growth and changes in government spending in Nigeria. Also, the postulated complementary effect of investment and the deleterious effects of inflationary pressure on output growth would be observed

Empirical Analysis

The analysis of the results obtained from the estimation of the model specified in the previous section is presented and analyzed in this section. First, we begin with the test for unit roots for each of the variables. The co-integration analysis as expounded by Engle and Granger (1987) is demonstrated through two procedures; the unit root test and co-integration tests which eventually lead to the estimation of an error correction model to capture the dynamic relationship .The idea is that if variables are integrated of order one, a linear combination of such variables would yield a co-integration series (Iyoha 2004). This means that a long-run relationship exists between such variables to represent the short-run dynamics.

The unit root test result, using the ADF (Augmented Dickey - Fuller) test, shows that after differencing the series once, they all became stationary. This is seen from the outcome of the ADF test statistics of each of the series. It is greater than the 95% critical ADF value. Thus, it is clear that each of the variables has unit root. We therefore proceed to test for co-integration.

Table 1: Unit Root Test (First Difference)

Variable	ADF Lag	ADF Test Statistics	95% critical ADF value	Remark
NDGP	2	-3.324	-2.887	Stationary
GOVEXP	2	-4.329	-2.887	Stationary
INV	1	-12.105	-2.887	Stationary
INFL	1	-25.701	-2.887	Stationary

The test of co-integration is done by testing for unit root in the residuals of the model where NGDP is regressed on the three explanatory variables. The test shows that the residuals are stationary since the value of the ADF test statistics is greater than, that of the critical ADF (in absolute values). This means that the variables are co-integration and a long-run relationship exists between them.

Table 2: Co-integration Test

ADF Lag 1	ADF Test Statistic	95% Critical ADF Value	Remark
1	-4.986	-4.196	Stationary

Short-run dynamic analysis: The result of the error correction representation is presented in Table 3 below

Table 3 Error Correction Model

Variable	Coefficient	T-Ratio
dNGDP (-1)	0.120	1.135
dGOVEXP	1.435	3.180
dINFL	70.454	0.076
dINV	1.722	2.564
dINPT	-7679.4	-0.217
ecm (-1)	-0.318	-3.555

$R^2 = 0.189$ $\bar{R}^2 = 0.152$

$F (5,108) = 5.04$ DW-Statistics=1.87

From the model given above, the coefficient of determination is quite low as it reveals that only about 19% of the systematic variations in short-run GDP is explained by the three explanatory variables and the ECM. The overall significance of the model is however assured. The F-value of 5.04 is significantly different from 0 even at the 1 percent level. Thus, we would accept that there is a significant short-run relationship between output growth and the three independent variables. Also, the DW-Statistics indicates absence of autocorrelation in the model.

The coefficient of the error correction term is an estimate of the speed of adjustment back to the long-run equilibrium relationship. The term is negative and significantly different from zero. This implies that in the event of a deviation between actual and long-run equilibrium level, there would be an adjustment back to the long-run relationship in the subsequent periods to eliminate this discrepancy. The low magnitude of the coefficient suggests that the speed of adjusting to long-run changes is slow and significant. In other words, approximately 31.8 percent of the change in output growth per quarter can be attributed to the disequilibrium between the actual and equilibrium levels.

Policy Implication

The results from the study suggest that government spending has a strong impact on output in a positive way. Thus, short-run variation in output responds largely to the changes in government spending. It also responds to changes in investment spending. Thus, government spending can be used as short-run output stabilizer to ensure that macroeconomic stabilization does not persist for a long time. Indeed, if government spends the exact crude revenue wisely output variable in the short-run can be minimized.

Conclusion

The main goal of this paper was to characterize as carefully as possible the response of output to government spending dynamism in Nigeria. From the preferred error correction specification, the conclusion was reached that when government spending increases, output also increases in the short-run. Moreover, there is a long-run relationship between the two variables.

In a country like Nigeria where fiscal dominance is so prevalent, it is imperative to note that government spending when channeled to the proper direction can help to stabilize output growth both in the short-run and in the long-run . Thus, fiscal expansion and macroeconomics viability move hand-in-hand in Nigeria. Indeed, the blind pursuit of indiscriminate deficit cutting and government spending limitation is not quite recommended. In the event of a decline in growth rate, such policies will do more harm than good in the short-run without remedying the long-run structural causes of the downturn. They will tend to deepen the recession by slashing

demand, and cuts in public investment may reduce future private investment and thereby lower long-run growth.

Finally, indiscriminate cuts in government spending may actually exacerbate poverty and inequality in the country both in the short-run and long-run. Fiscal policy options and their possible outcomes are dependent on the rate of growth; fixed fiscal targets make no sense in such a context. These issues are of particular significance for Nigeria in the context of the current situation of the Nigeria economy with its high and growing unemployment and draconian austerity measures which are being advocated by international agencies and are now in the core of mainstream macroeconomic policies.

References

Akpan, N. I. (2005). Government expenditure and economics growth in Nigeria: A disaggregated approach. *CBN Economic and Financial Review, 43(*1)

Baroo, R., & Sala-i, Martin (1992). Public finance in model of economic growth. *Review of Economic Studies 59*, 645-661.

Barro, R. J. Government spending in a simple model of endogenous growth, *Journal of Political Economy, 98,* 5 (October), Part II S103-S125.

Cooray A. (2009). Government expenditure, governance and economics growth *Comparative Economic Studies, 51(3):* 401-418 http"//www.ingentaconnect.com/content/pal/ces;jsessionid=q1q8lgkzfvms.alice

Diamond, J. (1990). Government expenditure and growth. *Finance and Development 27*(3), December.

Fajingbesi, A. A. & Odusola, A. F. (1999). *Public expenditure and growth.* A Paper Presented at a Training Programme on Fiscal Policy Planning Management in Nigeria, Organized by NCEMA, Ibadan, Oyo State, 137-179.

Nuredeen, A. & Usman, A. (2010). Government expenditure and economic growth in Nigeria, 1970- 2008: A disaggregated analysis. *Business and Economics Journal*, Volume 2010: BEJ-4.

Ogiogie, G.O. (1995). Government expenditure and economic growth in Nigeria *Journal of Economics Management, 2(1)*.