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Econometric Evaluation of Government Spending, System of Government and Economic Growth in Nigeria 1970 – 2007

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Abstract

The study relates to the econometric analysis of the relative effectiveness of fiscal policy management in Nigeria, between 1970 and 2007. It employed reduced forms model in addition to, Beta coefficient, Theil's inequality and Root Means Square Error (RMSE) techniques to investigate the stability and effectiveness of the estimated fiscal model which represent government spending, during and after estimation periods. The results reveal stability of the models and further confirmed the fact that government spending is the major determinant which influences and predict Nigeria macro economic activity. There is what appears to be a manifestation of the so-called 'crowding out' effects of fiscal policy actions in Nigeria. These are associated with the negative sings assumed by coefficients of the lagged fiscal policy variables (except recurrent expenditures).

Key words: Econometric Analysis, Government spending system of government, economic growth and crowding out effects

1.0 Introduction

Government spending habit is supposed to be guided by the fiscal Policy which is defined as actions taken by the government to alter the level of its taxes and expenditures in order to bring about desired changes in macro economic activity. Fiscal policy is supposed to work harmoniously with other set of policies such as monetary policy, exchange policy, trade policy and income policy so as to accomplish the following economic objectives:

(a) Price stability
(b) Full employment of all manners of productive resources
(c) Accelerated economic growth.
(d) Balance of payment equilibrium and
(e) Equitable distribution of income

There is however conflicts at times in the achievement of the stated objectives, thereby necessitating some sort of trade – off.

In Nigeria the government spending has been criticized by many and it was thus reported in both foreign and local media that Nigeria newly found democracy has exerted too much spending liability on the government at all levels. It is believed that Nigeria runs one of the most expensive democracies in the world far more than America

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where the country borrows her presidential system of government. For a country that was recently relieved of burden of indebtedness in 2007, the growing government expenditures in the face of dilapidating infrastructures and issue of government expenditure without serious justification has attracted abundant concerns and elicited strong interest from the policy makers and researchers in academics.

This work is therefore significant for a country whose democratic structures is fragile but which have been adjudged to have created reasonable alternative to the hitherto military rule .The military government had pervaded the administration of most populous African nation for over 30 years, and has rendered it grappling with developmental problems in spite of her abundant men and natural resources. For instance, only in 2011 budget, Nigeria Government earmarked ₦18 billion to provide presidential fleet, this in addition to ₦23.1 billion spent on the same fleet in August 2010, which implies that over ₦41billion was spent on presidential fleet in two years.

1.1 Objectives of the study

The objective of this study is to investigate the impact of government spending on economic growth. Specific objectives are therefore;-

(i) To examine the nature and determinants of government spending,

(ii) To assess the performance of the fiscal policy management of the government and make comparison between the military and the civil rules.

2.0 Literature Review

Fiscal stabilization and full employment are the two essential element of fiscal policy for the purpose include discretionary fiscal policy and non-discretionary fiscal policy, otherwise called automatic stabilizers. We shall discuss how each of these works, paying particular attention to their nature and applicability in developing economy like Nigeria.

The designation suggests, discretionary fiscal policy refers to the deliberate use of fiscal actions for achieving certain macroeconomic objectives. Traditionally, these policies are applied to the problem of recession and inflation. Let us sketch briefly the specific set of policies required for each case.

An expansionary fiscal action must be adopted for solving the problem of recession. This implies that aggregate demand must be boosted by: Increase in government spending and/or operating a budget deficit for expansionary effect if the federal budget is already in balance or reduces taxation or the combination of the duo

The application of the above policies will invariably generate multiplier effects which will pull the economy out of a recession through increased employment, output and income.

Let us now study in detail the mechanisms by which the proposed policies will influence stabilization, especially in the Nigeria economy.

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We noted earlier that government should increase expenditure in a recession and decrease it during inflation. The two types of government expenditures which can be used in accomplishing these tasks are direct purchase by government and transfer payments. The multiplier effect of direct government purchasing is often greater than that of transfer payments. This is because direct expenditure on programmes like public housing, road construction, transition programmes, and running administration amongst others will generate employment and output although transfer payments will trigger off consumption multiplier effects, such effects will be lower because of possible leakage into the savings stream. We can, therefore, conclude that direct purchases are more effective than transfer payments is fiscal measures.

In the context of the Nigeria economy, it should also be noted that the impact of direct purchase may be weakened by the fact that the items are mostly imported, as where the materials are domestically produced, the fiscal impact would not leak out of the economy.

Taxes are supposed to be increased during inflation and decreased during a recession. The stabilizing effect of taxation, however, depends on the type of tax used. Some economists for instance, are of the opinion that indirect taxes have a greater contractionary impact since they tend to act across a wide spectrum of commodities. It would appear that the issue depends on whether or not direct or indirect taxes are dominant in the revenue structure. In Nigeria, for instance indirect taxes especially from dominated the revenue structure. The channels by which tax measures stabilize the economy should, however, be noted. These are through a reduction in the purchasing power of households and discouraging business investment. The converse view that the reduction boosts aggregate demand needs some clarifications. First, such a reduction depends on the marginal propensity to consume (MPC) of the economy, the number of people caught in the tax net and the efficiency of the tax system. In Nigeria, for instance, a reduction in taxes may not have a substantial impact on Nigerians tax profile (the very rich often practice tax avoidance) and the proceeds of the cut would not necessarily be used for direct consumption. Empirical investigation has shown that windfall incomes in the Nigeria context are more savings effective than permanent (average) income, (Usman, 2010).

When the federal budget is balanced, contractionary fiscal policy requires that a budget surplus be decreased while an expansionary fiscal programme requires that a budget be increased. As was pointed out transfer payments are unearned income. Some categories of these payments, like public debt servicing, pension and gratuities and non statutory payments to states, have automatic stabilizing effects in recent times in Nigeria, the value added tax (VAT) with strong transfer element has automatic stabilizing effects.

In countries where agricultural productivity is high, such as the United States, government often embarks on farm income stabilization scheme. One of these is price support, whereby government buys and stocks farm produce when there is surplus and falling prices, and sells these to the public during periods of scarcity and rising prices. This with the use of such buffer stocks, price and stabilized by placing a ceiling during booms and a floor during recessions. This approach tends to stabilize both the income of farmers and the general price level in the agricultural sector of economy. Historically in Nigeria, marketing boards were set up in the 1950s and 1960s to

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perform a similar function for export produce. The boards were to retain surplus revenue when world market prices were high and expend them in supporting domestic prices when they fell below the average. The scheme worked well at first but soon faltered since the marketing boards were looked upon as revenue collection agents for the government. Since the dismantling of the marketing boards following the structural adjustment reforms of the 1986, these functions no longer exist.

Dividends in advanced countries are often maintained at a stable level by companies so that they do not fluctuate with profits. This means that the purchasing power of shareholders is considerably reduced during inflation when profits are to be higher. This exerts a stabilizing effect because the retained company profits are often saved.

In Nigeria, dividend policy used to be reviewed periodically to enhance its automatic stabilizing effects. Since the number of shareholders is relatively, small, their dividend policy, as in automatic fiscal stabilizer, was probably minimal. In recent times government has removed controls on dividend policies, so its automatic stabilizing effect has further been eroded.

2.1 Review of Empirical Literature

In the contention of Friedman (1963) having used America time series data accumulated from 1987 to 1958, reported that money supply exerts more influence on economy than fiscal policy. Friedman and Meiselman (1990) had made use of three important variables viz gross domestic product, consumption, as dependent variables and money supply as independent variable extending over 5 quarters with both end points (of the polynomial) constrained to be zero but reported lack of stability of the investment multiplier. Apart from US, Denmark, Finland and Norway, Barret and Walters (1976) conducted also for United Kingdom similar studies on the same subject.

For developing countries, Ajayi (1974) in the case of Nigeria Atsegolu (1975) for turkey and Ubogu (1985) for fifteen African countries remain major studies on fiscal policy and economic growth like Atsegolu-Tilman (1980) for Korea, Gupta work for Turkey, ltester (1997) again redefined autonomous expenditures and a variable and discovered that autonomous expenditure exert more influence on economic change in India and that agricultural had a great potential role to play in this country. Not only this, the study also concluded that high powered money schemed to fit in better as definition of money. Ajayi (1974) hypotheses for Nigeria is that fiscal policy exerts significant influence on Nigeria economy. Ajayi (1974) study also defined current government expenditure as proxy for fiscal policy.

More recently and using another definition of government expenditure, Sunmonu and Alarudeen (2004) that composition of variables to be incorporated on the model, is one important issue to be considered when looking

The definition of money encompasses currency savings and time deposit while automous expenditure is defined to comprise net private investment, not balance of trade and the government deficit on current account. The conclusion drawn from this work is that stock of money and not lending rate or investment is of greater relevance to the policy makers.

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Among the critic of this study are Hester (1964) Modigliani (1983) who felt not contented with Friedman S. definition of money and the three variable of consumption, money supply and autonomous expenditure was rather perceived as inadequate. The study carried out by Sandimo and Allingham (1972), indicate through parametric tests that the multiplier model employed in their analysis predicted the macroeconomic activities better than the money supply. This study also confirmed the report of Anderson and Jordan (1964) which indicate that economic activities in U.S.A. was better responded to government spending rather than monetary policy. But in contrast to the method adopted by Sandimo and Allingham (1992) the single equation reduced form model and the definition of money as currency plus demand deposits suggest money supply being superior. Much like the earlier works, this particular one is also criticized on two grounds, the use of quarterly data rather than annual data and the measurement of changes in fiscal policy without removing endogenous influence.

Using the model of Massachusetts Institute of Technology and Federal Reserve Bank (MIT/RB), Gramlich and Frank (1988) reported that fiscal policy worked in the determination of income level. Supporting this study are Karchbrenner and Frank (1998) Keran (2001) at least for many years after second world war, Donald Hester (1999), is of the belief that the appropriate method of testing a theory is to examine the accuracy of its prediction of endogenous variables given knowledge of the values of the variables specified by the theory to be exogenous. For instance, Daprano and Mayor (2000) reports stressed that the key to the accumulation of empirical knowledge as opposed to the construction of empirical hypothesis is the replication of empirical studies on new bodies of data.

However, Sunmonu and Alarudeen (2004) traced differences in the earlier studies to four sources which are (√) time period used for analysis, the choice of relevant variables and the technique used for estimating lagged coefficients and lack of appropriate post estimation tests.

However, Khan (1978) conducted four tests to compare the relative stability of monetary velocity and investment multiplier for America economy between 1953 to 1972 using quarterly data. Some of these tests are Cusum test Brown, Durbum and Evans (1975), log-likehood ratio test, time trend and moving regressions. Jordan (1989) following this method assumed a fourth degree polynomial.

2.2 Problems of application of fiscal policy

The main problems facing Nigeria is the successful application of so government spending which include the timing problem, the crowding-out problem, the political problem, the constitutional problem, the structural problem, the institutional problem and the problem of conflict of objectives.

In finding a cure for a deadly disease, time is essence. If diagnosis is early, the patients survival is more probable than if diagnosis is made at an advance stage of a disease. Cancer is a typical example of disease which cannot be cured if diagnosed late. The situation is the same for the application of fiscal policy to solve economic ills. Correct timing is always difficult to achieve because there are many lags between making and implementing fiscal policy. These include;

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a. The recognition lag, which indicates the time difference between the occurrence of the problem and its manifestation in the statistical trends. The problem is compounded in Nigeria because its statistical infrastructure and data base are extremely poor:
b. The administrative lag, which refers to the waiting period between the recognition of the problem and the taking of definite decisions to act on it. This lag is caused mainly by the slow process of democratic decision making in parliament. The decision often gets bugged down because of political considerations and even worse during military era when actions are not subjected to serious deliberations
c. The operational lag, which refers to the time needed for the implementation of fiscal action to have the desired effects. This operational lag is particularly long in a developing economy like Nigeria where there are bureaucratic bottlenecks, dependence on foreign sources of supplies, and consultants; and poor infrastructure. The time lag problems can create a situation where late policy application can destabilize the economy instead of stabilizing it.

3.0 Research Methodology

This study shall make use of simple reduced form models to bring out the relevant macroeconomic relationship. Based on the estimation results a number of tests such as stability chow and Granger causality, shall also be carried out.

3.1 Model Specification

Arising from the perused literatures. It appears differences in analytical technique variable definition, time lag and data availability have given rise to differences in empirical results in many cases. To bring out relevant macro-economic behavioral relationships two major methods are normally explored. The method is either simple reduced form model or structural model. Following Ango and Fordan (1997), this study employs simple reduced form models and incorporate distributed lag form as it has not been used in similar studies ever conducted for developing countries (Usman, 2010). The annual time series data spanning between 1970 and 2007 shall be used.

$$\Delta Y_t = \alpha_o + \alpha_1 \Delta N_t + X_2 \Delta N_{t-1} + \alpha_3 \Delta R_{t-1} + \alpha_4 \Delta R_{t-1}$$

$$+ \alpha_5 \Delta K_t + + \alpha_6 \Delta NK_t \, e_t \quad \text{.....(i)}$$

$$\Delta Y_t = \alpha_o + \alpha_1 \Delta N_t + \alpha_2 \Delta R_t + \Delta K_t + e_t \quad \text{.....} \quad \text{(ii)}$$

$$\Delta Y_t = \alpha_o + \alpha_1 \Delta A_t + \alpha_2 \Delta A_{t-1} + \alpha_3 \Delta A_{t-2} + e_t$$

Where

Δ - The first difference

Y - Gross Domestic Product

K - Capital Expenditures (federal to nominal prices)

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R - Recurrent Expenditure (federal at nominal price)

N - Net exports (nominal)

A - K+R+N autonomous expenditure

Dummy variable of 0 and 1 were also introduced to take care of effects of system of government 0 = Military Rule, 1= Civil Rule

All these models shall be estimated by Ordinary least square.

3.1.1 Causality test model

It is observed that the understanding of causality is not the same for all economists, Zellner (1979). But this study shall employ the original arranger causality test between two series, using least square approach.

$$\Delta Y = \sum_{j=1}^{3} \beta j \ \Delta Y_{i-j} + \sum_{i-1}^{3\alpha} \Delta A_{t-1} + e_t$$

$$\Delta A_t = \sum_{j=1}^{3} \theta j \ \Delta Y_{i-j} + \sum_{i-1}^{3} \alpha i \Delta A_{t-1} + e_t$$

$$\Delta A_t = {}_{j=1}\alpha j \Delta A_{1-j} + e_t$$

Source of Data

The secondary data required for this study are extracted from various issues of the National Bureau of Statistics Publications such as annual absracts of statistics and digest of statistics. A part from this source, the Central Bank of Nigeria (CBN) statistics bulletin, annual reports as well as CBN Economic and Financial Review.

4.0 Presentation and Discussion of Results

The following set of equations, results relates to the purely autonomous expenditure variables under the reduced form models of income determination:-

$\Delta Y = 3594.83^{*} + 0.72^{*}\Delta N_E - 1.74^{***}\Delta N_{E-1} 3.03^{***}\Delta N_t$
(1.54) (1.53) (2.24) (2.88)

$\bar{R}^2 = 0.54$ D.W -1.43 F.656****
N = 29

$\Delta Y_t = 3927.86^{*} + 0.45\ \Delta V_t + 2.26^{***}\ \Delta R_t + 1.30 \Delta K_t$
(1.63) (0.96) (2.42) (1.14)

$\bar{R}^2 = 0.47$ D.W – 1.62 F = 9.67***

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N = 28

$$\Delta Y_t = 3.\ 891.68^{*} + 0.83^{**}\ \Delta V_t - 0.06\ \Delta R_{t-1} + 1.34^{***}\Delta A_{t-2}$$
$$(1.62) \qquad (3.25) \qquad (-0.14) \qquad (2.60)$$

$\overline{R}^2 = 0.47$ D.W – 1.62 F = 9.67^{****}

N = 28

Note:

*	-	Significant at 80% confidence level
**	-	Significant at 90% confidence level
***	-	Significant at 95% confidence level
****	-	Significant at 99% confidence level

The figures in brackets are T –statistics

The three sets of equation have explanatory powers that ranges from 47% to 55% (R^2). All the current year coefficients of the explanatory variables have the correct signs (positive). However, negative signs characterize the coefficients of the variables (except recurrent expenditure) in the immediate past and these coefficients are significant statistically in most cases. This may be a manifestation of the so-called "crowding out" effects of fiscal policy variables in the economy. This may appear on the surface to confirm the negative coefficient of some fiscal variables in Ajayi's (1974) study. However, if one consider the fact that there is no purely fiscal model nor distributed lag structure in Ajayi's (1974) study one will reasonably come to the conclusion that fundamentally the basis for comparison let alone confirmation does not exist between this study and Ajayi's (1974) study on the controversial issue of 'crowding out' effects of fiscal policy.

A good number of the variables (explanatory) under the purely fiscal models/equations are statistically significant at 99% confidence level. The tests for serial autocorrelation for each of the equation, however, remain inconclusive.

The autonomous expenditure-variables significantly out perform the monetary variables in the current period if we consider sizes of variable's coefficients and more importantly the coefficient's statistical significance.

The negative signs of coefficient in this study may be symptoms of "crowding out" effects of fiscal policy variable on the economy. This may be buttressed by the fact that the government expenditures which constitute the major portion of our autonomous expenditures in this study usually involve sourcing of credit from the domestic economy at rates, risks and tenors more favourable and reliable than private lending/borrowing terms in the eyes of providers of loanable funds. And this will compete away funds for private investment transactions. The effect of this (channeling of large chink of funds to government) will be felt negatively in the economy if not in the current period (due to lags in policy effect) it will be discernible later. Again the "crowding out" effects of the autonomous expenditures have, in recent times, been traced to the excess liquidity engineered by the monetization of government

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foreign exchange receipts and the ore than statutory borrowing (through ways and means Advances) of government from the central.

Bank of Nigeria. The excess liquidity in the banking system has generated monetary oriented inflationary pressures in the economy and it has also led to depreciation of Naira (in the foreign exchange market) through excessive bidding.

All these have give rise to high inflationary pressures. Both high inflation and interest rate have, without doubt, the tendency to discourage private investment and even some public sector investment thereby leading to reduction in macro economic activity both in real and nominal terms.

Result of Test of Stability

The Chon Test: is the test of stability employed in this estimated model. The test involved splitting the period of regression into two. One for 1970 to 1985 and the other one is from 1986 – 2006.

On the whole, nine equations were estimated to enable us carry out our test which gives rise to an f-statistics for each of the three models estimated. The result of the tests are given below:

Note: DF means degree of freedom

The result of the test shows that all the estimated model are stable and therefore agrees with that Ubogu's (1985) study.

From the table above, it is implied that the direction of causality between gross domestic product and autonomous expenditure is unidirectional. The result seems to confirm the critical role being played by the monetization of foreign exchange receipt of the government whose consumption and investment expenditure constitue the prime mover of the economy.

However, this result of our causality test must be taken with caution because in the discipline of econometrics, regression analysis is taken to deal with the dependence of one variables on other variables it does not imply nor extend to causation (Gujarati, 1988). If we then take regression analysis and the result and conclusions that arise there of for what they are a matter of dependence of one variable on others it will not be logical and reasonable to assess/judge them with a fundamentally different criterion or analysis that goes by the name of causality test or analysis (Sunmonu & Alarudeen, 2005).

5.0 Conclusion and Recommendation

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There appears to be a manifestation of the so called "crowding out" effect of fiscal policy action in Nigeria. These are associated with the negative signs assumed by coefficient of the lagged fiscal policy variable except recurrent expenditures).

In the case where the lagged fiscal policy variables are characterized by positive signs coefficients, it is found to have little influence on gross domestic product. The result here suggest that government spending in Nigeria is not targeted to the real sector as they are seemed consumption rather than investment expenditures. For most periods, more of Nigeria expenditures were expended on transition programmes during the military regione. And these transition programmes were prolonged and subsisted for twenty four years out of thirty six years for which this study was conducted. It is important to state that government spending under military regome does not have recourse to democratic process as it is done during the civilian rule.

5.1 Policy Recommendation

i. The government and its agent like the Federal Ministry of Finance and Economic Development, Central Bank and the National Planning Commission should adopt policies that will help minimize the "crowding out" effects of autonomous expenditures projects due to insufficient finding.

ii. Government (at all levels) need to keep up the tempo of their requirement expenditure activity because of its positive effects on macro-economic activity both at present and in the immediate past.

iii. There is a need to ensure that the economy does not depend much on foreign exchange earning from a single source. There is therefore a need to invest the nation's surplus foreign exchange resources in profitable investment overseas as it is being done by other oil exporting countries especially those in the middle east. There is also need to broaden government and private sources of foreign exchange by expanding exports to include manufactured goods, collecting local changes and foreign currency denominated feeds. Inflow of long term funds into the country should be encouraged.

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Equations	**F-Statistics**	**F.0.05(table)**	**D.F**	**Decision**
1.	-1.5	2.71	7,15	Stable
2.	-1.83	2.82	4,22	Stable
3.	-3.28	2.87	4,20	Stable

Note: DF means degree of freedom

The result of the test shows that all the estimated model are stable and therefore agrees with that Ubogu's (1985) study.

Result of Causality Test

Direction of Causality	F-Value	F 0.05(4,17)	Decision
$\Delta A \rightarrow \Delta Y$	1.18	2.96	Reject
$\Delta Y \rightarrow \Delta A$	9.55	2.96	Do not reject