

“Public finances and economic growth in Nigeria”

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Public finances and economic growth in Nigeria

Abstract

Examining the empirical relationship between government revenues and expenditures, expenditures and economic growth is a fundamental step in understanding the behavior of Nigerian public expenditure and the economy on the basis of Wagner's law or the Keynesian theory and Friedman (1978) or Peacock and Wiseman's (1979) revenue-spend and spend-revenue hypotheses. The study tests for the stationarity properties of the time series public finance data of the Federal Government of Nigeria (1979-2008) using the Augmented Dickey-Fuller (ADF) test. The Johansen's cointegration test is conducted to determine whether a group of non-stationary time series variables used for this study is cointegrated or not. The VAR-based Error Correction Model is used as test for causality. The study have found that growths in both real gross domestic and government revenue causes growth in government expenditure. The implication is that government expenditure is not employed as a fiscal instrument and the revenue growth drives the government expenditure for the study period. The volatility in oil-driven revenue profile of Nigeria requires public expenditure management reforms and the need to check the productiveness of government expenditure and diversify the revenue drive.

Keywords: government expenditure, revenue and real GDP.

JEL Classification: H72, O40.

Introduction

No phase of public finance, perhaps, has received so much attention as the economic effects of public expenditures. Public expenditures, nevertheless, do have important economic consequences which should be kept clearly in mind.

The size of government and its impact on economic growth has emerged as a major fiscal management issue facing economies in transition. Previous research focused predominantly on size of government in industrialized countries. However, given the openness of most developing countries, trade dependency, the vulnerability to external shocks, and volatility of finances, the role and size of government become relevant to adjustment and stabilization programs.

The fiscal volatility of the post-1979 period indicates a continued absence of coordination between expenditure and revenue decisions (Akpan, 2005). Friedman (1978), for example, argues that governments adjust expenditures to the level of revenues, so that control of taxation is essential to limit growth in government. Alternatively, the spend-and-tax model posits that revenues will be adjusted to finance any politically chosen level of expenditures. A third perspective, reflecting the institutional separation of allocation and taxation functions of the federal government, hypothesizes the independent determination of revenues and expenditures.

In Nigeria public expenditures have been expanding for decades, as Akpan (2005) opines that the observed growth in public spending appears to apply to most countries regardless of their level of economic development. We need to explain the behavior of Nigerian public expenditure and the econo-

my on the basis of Wagner's law or the Keynesian theory and Friedman (1978) or Peacock and Wiseman's (1979) hypotheses.

Examining the empirical relationship between government revenues and expenditures is a crucial step in understanding the future path of budget deficit. Four alternative explanations have been used to describe the relationship between these variables in the budgetary process (Baghestani and McNown, 1994): (1) the tax-and-spend hypothesis; (2) the spend-and-tax hypothesis; (3) the fiscal synchronization hypothesis; and (4) the institutional separation hypothesis. The issue of which hypothesis best describes the nature of the budgetary process in Nigeria is yet to be resolved in the literature. However, existing research has implicitly assumed that the state of the budget and whether or not the budget deficit (or surplus) is worsening or improving does not matter. We argue that government decision-makers may take these factors into account when determining expenditures and tax policy. As such, this article reexamines the theories and hypotheses by using a more robust econometric technique that allows for asymmetry in the relationship between revenues and expenditures.

On the expenditures side, the study seeks to study the relationship between government expenditure and economic growth. Do expenditure levels respond to economic growth as posited by Wagner, rather than revenue decisions? The goal of this investigation is to test the Wagner's Law and the revenue-spend theory of Friedman (1978) for the Nigerian case based on the following hypotheses:

H₁: There is no causal relationship between economic growth and government expenditure in Nigeria.

H₂: There is no causal relationship between government revenue and expenditure in Nigeria.

1. Literature review

Endogenous growth theory gives governments a theoretical basis for actively fostering growth. Better knowledge on the dynamic relationship between government expenditure and GDP is relevant for policy in two major respects (Arpaia and Turrini, 2008). First, it improves the understanding of long-term, structural public finance issues. Is the size of government shrinking or expanding in Nigeria? Answering this question is relevant for the debate on the sustainability of public finances in Nigeria. In particular, it could help to assess the impact on government expenditures and then on deficits arising from a structural deceleration in or, conversely, from an improvement in the growth potential.

Second, a better understanding of the dynamic relationship between government expenditure and GDP helps the comprehension of policy-relevant issues over a short to medium-term horizon. Disposing of a reliable measure of the structural relation between the non-cyclical component of government expenditure and potential output is key to obtaining a benchmark against which to evaluate the stance of expenditure policy and then of overall fiscal policy. Judging whether expenditure policy is expansionary or contractionary requires some idea about how a neutral expenditure policy would look like. However, while there is broad consensus that a neutral revenue policy is such that government revenues move together with output in a proportion depending on structural factors such as the degree of progression of the tax system and the responsiveness of the various tax bases with respect to output (the output elasticity of revenues), no clear a-priori exists for what concerns expenditure policy.

Estimating the long-term relationship between government expenditure and GDP permits the formulation of a benchmark for neutral expenditure policy grounded on empirical evidence. Useful information for policymaking would also be provided by estimates of the speed at which government expenditure adjust to their long-term relation with GDP after a shock in economic activity. In the Nigeria context, this information would be helpful, for instance, in formulating and assessing budgetary adjustment plans with a view to achieving the recent Federal Government Medium Term Expenditure framework (MTEF) objectives.

Buti and Van den Noord (2003) adopt a definition of neutral expenditure policy according to which primary government expenditures grow in line with potential output plus expected inflation. Fatàs, Von Hagen, Hughes-Hallet, Siebert and Strauch (2003) and Hughes-Hallet, Lewis and Von Hagen (2004) resort to three different defini-

tions of ‘neutral fiscal policy’: government spending is held constant in volume terms; government expenditures grow in line with revenues; government expenditures grow in proportion with trend GDP. Moreover, Gali and Perotti (2003), among others, consider a broader concept of “non-discretionary” fiscal policy, obtained as the residual of an estimated fiscal reaction function where the primary cyclically-adjusted budget balance is regressed against its own lag, the lagged debt/GDP ratio and a measure of the output gap.

The Wagner’s law has been tested in different ways. In early time series analyses, government expenditure is regressed on GDP without taking into account the dynamic properties of the series (Ram, 1987). More recently, new test specifications have been implemented taking into consideration non-stationarity and co-integration. This allows for a more structured modeling of expenditure dynamics introducing the distinction between a long-term relationship and short-term adjustment. Kolluri, Panik and Wahab (2000), Akitoby, Clement, Gupta and Inchauste (2004) and Wahab (2004) are among the cross-country analysis allowing for dynamic specifications.

There is a lack of consensus on both the empirical impacts of size of government on growth. In addition, economic theory does not provide a well developed methodology for the incorporation of government expenditures in standard growth models. Studies that have found a negative relationship between the size of government and growth include Landau (1986), Grier and Tullock (1989), Barro (1990). Others that have found a positive relationship are those of Ram (1986) and Aschauer (1989).

Studies based on Nigeria have investigated the long-run relationship between education and economic growth in Nigeria between 1970 and 2003 through the application of Johansen Cointegration technique and Vector Error Correction Methodology (Babatunde and Adefabi, 2005). The result establishes a long-run relationship between education and economic growth.

Aigbokhan (1996) investigates the impact of government size on economic growth between 1960 and 1993 with a focus on the effects of the Structural Adjustment Program (SAP) introduced in July 1986. Empirical estimates from the Aigbokhan study reported a bi-directional causality between government total expenditure and national income. This finding is weakened by the use of the Ordinary Least Square (OLS) regression analysis and augmented with the standard Granger-Causality testing approach. Using the Engle Granger two step procedure and standard causality tests, Essien (1997)

found that the variables (public spending and real income) were not cointegrated and hence could not establish a long-run relationship. In addition, causality tests performed on his models confirmed that public expenditure does not cause growth in income and there was no feedback mechanism.

More recently, Aregbeyen (2006) using Johansen cointegration and standard causality tests found a unidirectional causality from national income to total public expenditure i.e. a support for Wagner's Law. There is bi-directional causality between non-transfer public expenditure and national income. In contrast, the causality from national income to non-transfer public expenditure was found to be stronger than the reverse direction following variance decomposition analysis. Babatunde (2007) tests Wagner's Law for Nigeria using annual time series data between 1970 and 2006. It adopts the Bounds Test approach based on Unrestricted Error Correction Model and Granger causality tests. Empirical results from the Bounds Test indicate that there exists no long-run relationship between government expenditure and output in Nigeria but found a weak empirical support in the proposition by Keynes.

There is a lack of consensus on both the empirical impacts of public expenditure on growth in Nigeria. Perhaps, the methodology employed accounts for these. The use of VAR-based ECM is found more appropriate given weaknesses in OLS and Granger Causality tests. There are a few empirical studies relating to the impact of the functional composition of public expenditure and economic growth in the case of developing countries, like Nigeria. Only few studies have been found, which analyze the composition of public expenditure (Cullison, 1993; Singh and Weber, 1997).

Several hypotheses have also resulted from the causal relationship between government revenue and public expenditure (Gounder, Narayan and Prasad, 2007). Peacock and Wiseman (1979) advocate spend-revenue hypothesis which states that changes in government expenditure cause changes in government revenue, Eita and Mbazima (2008) found that causality runs from both directions.

2. Theoretical framework

It is common knowledge that fiscal policies cannot bring about changes in long-run growth of output in a neoclassical growth model. The introduction of endogenous growth models that incorporate the government sector has led to the opposite conclusion that fiscal policies can affect the long-run growth rate of an economy (Barro and Sala-i-Martin, 1992).

In models of endogenous growth, government policies can improve the factor allocation of the market

due to market failure. As a result, private factor productivity and the accumulation of physical capital and human capital respectively can be increased. Public inputs, natural monopolies or spill-over effects are the main justifications for government provision. In theory, these publicly provided goods enter the production function so that they can boost the steady-state growth rate (Barro and Sala-i-Martin (1992) for a clear theoretical exposition). Of course, there is some debate over the question of which particular expenditures should be classified as productive and which not (Kneller, Bleaney and Gemmel, 1999). Certainly, empirical studies should shed some light on this debate.

Several alternative models of government finance characterize the dynamic relationship between expenditures and revenues. The tax-and-spend school, championed by Friedman (1978) views expenditures as adjusting, up or down, to whatever level can be supported by revenues. This view implies a causal relation running from revenues to expenditures. The spend-and-tax model posits the reverse relation, with revenues responding to prior spending changes. Peacock and Wiseman see economic or political crises creating increased expenditure programs that are subsequently ratified by tax increases (Peacock and Wiseman, 1979). Barro's tax-smoothing model also implies causation running from expenditures to revenues (Barro, 1979).

Within the public finance literature, it is often assumed that a government determines both revenues and expenditures in ways that maximize the social welfare of the society. However, four alternative hypotheses have been advanced to ascertain the nature of the causality between these variables in the budgetary process. The tax-and-spend argument proposes that changes in government revenues lead to changes in government expenditures. Friedman (1978) and Buchanan and Wagner (1978) were early proponents of this view but differed in their perspectives. Friedman argued that increasing the resources available to government by increasing tax revenues will only lead to increases in government expenditures. The Friedman version of the tax-spend hypothesis suggests that government revenues have a positive effect on government expenditures. Alternatively, Buchanan and Wagner argued that increases in government revenues may lead to decreases in government expenditures through fiscal illusion. In particular, if the government is financing expenditures by means other than direct taxation, the fiscal illusion occurs because the public pays less in direct taxation but more in the form of indirect taxation. If indirect taxation declines while direct taxation increases, this trend could reduce government expenditures.

The spend-and-tax hypothesis suggests that a government first makes expenditure decisions and then adjusts tax policy and revenues as necessary to accommodate expenditures. From a Ricardian equivalence perspective, Barro (1979) argued that increased government expenditures financed by borrowing will translate into higher future tax liability for the public. In the context of fiscal policy response to “crisis” situations, Peacock and Wiseman (1979) argued that temporary increases in government expenditures in response to such crises will lead to higher permanent taxes. Under either perspective, higher expenditures would lead to higher taxes.

Many studies have found that revenues and expenditures are cointegrated. The finding of cointegration implies that the standard UVAR specification is incorrectly specified, thereby casting doubt on the earlier causality test findings. Numerous studies have yielded mixed results from applying the ECM as the dynamic specification for the cointegrating relationship between revenues and expenditures. For example, Bohn (1991), Mounts and Sowell (1997), Koren and Stiassny (1998), Garcia and Henin (1999), and Chang, Liu, and Caudill (2002) supported the tax-spend hypothesis whereas Jones and Joulfaian (1991) and Ross and Payne (1998) argued in favor of the spend-tax hypothesis.

Under the fiscal synchronization hypothesis, a government simultaneously chooses the desired package of spending programs and the revenues necessary to finance such spending programs. Musgrave (1966) and Meltzer and Richard (1981) are proponents of this view of the budgetary process. In addition, Miller and Russek (1989), Hasan and Sukar (1995), and Owoye (1995) found evidence to support the fiscal synchronization hypothesis. Finally, under the institutional separation hypothesis, government decisions to spend are independent from decisions to tax. Hoover and Sheffrin (1992) and Baghestani and McNown (1994) have provided evidence of this view.

Wagner and Keynes propositions present two opposite perceptions in terms of the relationship between public expenditure and growth in national output. Peacock and Wiseman provide explanation to public expenditure growth and government revenue. While according to Wagner’s approach (1890) causality runs from growth in national output to public expenditure, the Keynesian approach assumes that causality runs from public expenditure to growth in national output in times of recessions.

3. Methodology

This research utilized the annual time series data of the Federal Government of Nigeria expenditures (*GOVEX*), revenues (*REV*) and real Gross Domestic Product (*RGDP*) for the sample period of 1979-

2008. This study employed the techniques of cointegration and error correction models (ECMs). The stationarity properties of the time series data was investigated using the Augmented Dickey-Fuller (ADF) test. The Johansen’s (1987) cointegration test was conducted to determine whether a group of non-stationary time series variables used for this study is cointegrated or not. Finally, the direction of causality for the hypotheses using Vector Error Correction Model based causality test is examined.

The Vector Error Correction model specifications are stated in equations (1)-(4) as follows.

RGDP and government expenditure:

$$\Delta \ln RGDP = \beta_0 + \beta_1 \Delta \ln RGDP_{t-1} + \beta_2 \ln GOVEX_{t-i} + Ect_{-1} + \varepsilon_{t2}, \quad (1)$$

$$\Delta \ln GOVEX = \alpha_0 + \alpha_1 \Delta \ln GOVEX_{t-1} + \alpha_2 \ln RGDP_{t-i} + Ect_{-1} + \varepsilon_{t1}. \quad (2)$$

Revenue and government expenditure:

$$\Delta \ln REV = \beta_0 + \beta_1 \Delta \ln REV_{t-1} + \beta_2 \ln GOVEX_{t-i} + Ect_{-1} + \varepsilon_{t2}, \quad (3)$$

$$\Delta \ln GOVEX = \alpha_0 + \alpha_1 \Delta \ln GOVEX_{t-1} + \alpha_2 \ln REV_{t-i} + Ect_{-1} + \varepsilon_{t1}. \quad (4)$$

4. Discussions

The pattern of growth in *C* has been expanding since the late 1970s as indicated in Figure 1.

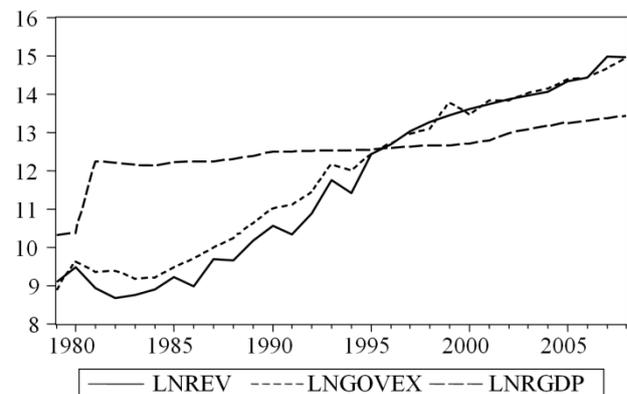


Fig. 1. Government expenditure, revenue and real GDP growth pattern

The fiscal stress in the federal government finances is particularly noticeable in period from mid-1990s. The growth in RGDP before this period was significant and later fell below both aggregate revenue and expenditure. This trend has remained so up till 2008. This pattern is perhaps, indicative of quality of government spending and the volatility of oil-revenue dependent government expenditures.

The first phase of the analysis is the stationarity tests in respect of the variables. The results of the tests are as follows.

Table 1. ADF test statistic for *GOVEX*, *REV* and *RGDP*

	t-statistic	5% critical value*
<i>GOVEX</i>	4.573870	-1.9535
<i>REV</i>	3.462286	-1.9535
<i>RGDP</i>	14.95956	-3.5796

Source: Eviews 4.0 econometric software output (2010).

Note: *MacKinnon critical values for rejection of hypothesis of a unit root.

The t-statistics is greater than the critical values in all the variables (*GOVEX*, *REV* and *RGDP*) in Table 1, at 5% level of MacKinnon critical values.

The second stage analysis is the estimation of cointegration tests. The cointegration test between *REV* and *GOVEX* is supported at lag 2 by final prediction error (FPE), Akaike information criterion (AIC) and Hannan-Quinn information criterion (HQ).

Table 2. Unrestricted Cointegration Rank Test for *REV* and *GOVEX*

Hypothesized		Trace	5 percent*
No. of CE(s)	Eigenvalue	Statistic	Critical value
None*	0.429123	15.64802	15.41
At most 1	0.018795	0.512294	3.76
Hypothesized		Max-Eigen	5 percent
No. of CE(s)	Eigenvalue	Statistic	Critical value
None*	0.429123	15.13572	14.07
At most 1	0.018795	0.512294	3.76

Source: Eviews 4.0 econometric software output (2010).

Note: *Denotes rejection of the hypothesis at the 5% level.

Table 4. Tests of causality, Vector Error Correction estimates

Error correction:	<i>D(LNGOVEX)</i>	<i>D(LNREV)</i>		<i>D(LNGOVEX)</i>	<i>D(LNREGDP)</i>
Ect	0.274317	1.406205	Ect	-0.025206	0.017627
Standard error	(0.34158)	(0.43370)	Standard error	(0.03698)	(0.00753)
t-statistics	[0.80308]	[3.24233]	t-statistics	[-0.68162]	[2.33964]

Source: Eviews 4.0 econometric software output (2010).

Table 4 indicates that causality runs from Government revenue (*REV*) to government expenditure (*GOVEX*) and causality runs from *RGDP* to *GOVEX*.

Conclusion and recommendations

The validity of Wagner's Law and Friedman's hypothesis for the Nigeria case over the periods of 1979-2008 has been studied. For this purpose, recent trend in public expenditure and literature developed on Wagner's Law and on Friedman's hypothesis were firstly explored. Our subsequent impression was that recent advances in econometric techniques must be taken into account in empirical studies for some given reasons. For this purpose, stationarity properties of the data and the order of integration of the data are, firstly, empirically investigated by the Augmented-Dickey Fuller (ADF) test.

The Trace test indicates 1 cointegrating equation(s) at the 5% level and the Max-Eigenvalue test indicates 1 cointegrating equation at the 5% level in Table 2. The lag order selection criteria indicates lag order selected at lag 1 by the sequential modified LR test statistic (each test at 5% level), Schwarz information criterion (SC), FPE, AIC, and HQ criterion.

Table 3. Unrestricted Cointegration Rank Test for *RGDP* and *GOVEX*

Hypothesized		Trace	5 percent
No. of CE(s)	Eigenvalue	Statistic	Critical value
None*	0.599943	28.24875	25.32
At most 1	0.121995	3.512782	12.25
Hypothesized		Max-Eigen	5 percent
No. of CE(s)	Eigenvalue	Statistic	Critical value
None*	0.599943	24.73597	18.96
At most 1	0.121995	3.512782	12.25

Source: Eviews 4.0 econometric software output (2010).

Note: *Denotes rejection of the hypothesis at the 5% level.

The Trace test indicates 1 cointegrating equation(s) at the 5% level and the Max-Eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels in Table 5.

5. Test of hypotheses

The third stage analysis is the test of causality between the variables *REV* and *GOVEX* and *RGDP* and *GOVEX*.

ADF test results show that all the variables were stationary in first differences. Since the variables for each regression model are integrated of $I(1)$, cointegration test was applied to all versions of the regression models.

On the basis of co-integration results it found cointegration between GDP and government expenditure, and government expenditure and revenue. It means that there is a long-run relationship between government expenditure and *RGDP*, and public expenditure and revenue for the Nigeria case.

The Vector Error Correction modeling technique shows that growth in *RGDP* and revenue causes the growth of public expenditure. The observed behavior of governments to see revenue booms as permanent and downturns as temporary, resulting often in disproportionately higher increases in expendi-

ture, for given increases in revenue, resulting in fiscal deficits. The fiscal deficits are invariably covered either through high interest loans and overdrafts secured against future revenue transfers, or/and accumulation of unpaid liabilities; all of which render the entire system increasingly precarious and unsustainable.

The critical facts about public revenue in Nigeria are that it is inadequate and unstable. The inadequacy reflects the low productivity of the economy as a whole, while the instability reflects the over-reliance on one particularly volatile source of revenue – oil. The major cause of revenue volatility is a combination of two factors: the large and unpredictable fluctuations in oil revenue and the large share of oil revenue in total revenue. The second factor is a direct function of the small size and low growth of non-oil revenue.

Volatility of revenue is a major constraint in the management of the economy because it increases the difficulty of realistic and effective financial management, most critically in planning, budgeting and budget implementation. In the Nigerian experience, there has been the tendency to embark on new programs and projects and to increase the level of expenditure in times of increased revenue inflow (revenue-spend hypothesis) without due regard to whether or not such “windfalls” will last long enough to sustain the new commitments. The result is that when the revenue flows slow down government often resorts to deficit financing.

The negative impact of revenue volatility is due not so much to the volatility of the inflow as to *how* the

inflow is managed. Improved planning and budgeting systems and transparency and accountability in public expenditure management would reduce the leakages and feed increased output and productivity.

It is clear that knowledge of the true nature of the causative process between government expenditure and RGDP will help determine the robustness of the estimated relationship. Either a Wagnerian or Keynesian causality, the knowledge of the precise causative process has important policy implications. Since the causality is Wagnerian, public expenditure is relegated to a passive role, if it were Keynesian, it acquires the status of an important policy variable.

The findings imply that public expenditure is relegated to a passive role and revenue continues to drive public expenditure growth pattern in Nigeria with attendant fiscal shocks. There must, therefore, be strong measures to enhance public expenditure management and implementation of policies to widen revenue bases in Nigeria. The recent attempt by the federal government to establish a medium-term expenditure framework is commendable. Emphasis should be strongly placed on diversifying the revenue base into fiscal sources and other non-oil revenue sources.

Stabilization of public expenditure and the need to pursue productive spending is strongly recommended in efforts to address the challenges of the global financial crisis. It is not how much spent but how well it is spent that can address the crisis in Nigeria. Fiscal funds should be established for off-budget receipts and targeted at specific infrastructural development.

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