



GOVERNMENT REVENUE AND GOVERNMENT EXPENDITURE NEXUS: EMPIRICAL EVIDENCE FROM KADUNA STATE

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Abstract

The study analyses government revenue and government expenditure nexus in Kaduna state. The objective of the study is to examine the government expenditure and government revenue for Kaduna State. This study employed time series data to investigate the nexus between government revenue and government expenditure in Kaduna State during the period 1990-2017. Johansen cointegration and Granger causality was applied as tool of analysis to test the causal relationship between government revenue and government expenditure. The empirical findings reveal that there is a long-run cointegrating relationship between the variables. Also, there is evidence of causality between government revenue and government expenditure, causality flows from revenue to expenditure, but there is no causality for government budget and expenditure in Kaduna state. This suggests Uni-directional causality between government revenue and government expenditure in Kaduna state, supporting the tax and spend hypothesis, which implies that in Kaduna State expenditure decisions are not made in isolation from revenue decisions. The study therefore concludes that the actual influence of government revenue on government expenditure is predicated on the actual budget realization. The study recommends improved revenue and expenditure estimation methods in the state, pruning over bloated size of the government budget to be realistic with the revenue potential of the state in addition to expanding the tax net to deepen government revenue.

Keywords: Expenditure, Government Revenue, Kaduna State

JEL Classification:

Introduction

The challenges of governance continued to develop as the society grows. The quest for infrastructural development and other social amenities that include schools, roads, bridges, markets, hospitals, rail lines, airports, and sea ports, the security of life and properties of the citizens against local and foreign aggression are some of the responsibilities of the government in place. For the government to surmount the challenges of governance and societal development, they mobilize revenue through different sources and utilize same in fiscal allocation order to provide the mechanism for development.

Kaduna State like any other state in Nigeria has the social responsibility to look after the welfare of its

citizens as enshrined in the Constitution of the Federal Republic of Nigeria. More importantly, the government needs to address issues relating to social justice, poverty alleviation, housing, health, education and human rights. To carry out these enormous responsibilities, the Government raised revenue from tax and non-tax sources known basically as statutory allocation and Internally generated revenue, which are the income from the monthly Federal allocation and the income that accrues to the State and Local Government from within the areas of their jurisdiction as a result of their internal efforts. They include taxes Pay as You Earn (PAYE), property tax, personal income tax, capital gain tax, fines and fees, licences, land registration and survey fees, rents on government properties, interest repayment/dividends and

reimbursement refund etc. The overriding objective, according to Dike (2000) is to collect the maximum revenue with the minimum economy and minimum interference with the legitimate trade of the taxpayer.

Over the last couple of decades, a large number of studies have investigated the nexus between government revenue and government expenditure. This is not surprising given the importance of the subject matter in public economics; particularly the direction of causality has important implications for budget deficits. The extant literature can be categorized into two groups. The first group of studies has used traditional econometric techniques (Anderson, Wallace, & Warner, 1986; Blackley, 1986; Jones & Joulfaian, 1991; Manage & Marlow, 1986; Marlow & Manage, 1987; Provopoulos & Zambaras, 1991; Ram, 1988a, 1988b; Von Furstenberg, Green, & Jeong, 1986) based on vector autoregression (VAR) models. The second group of studies has used modern econometrics techniques (Saolu, Dopemu and Monday, (2015), Afuleroh, Denis and Okoye (2014), Kizito and Asimiyu (2014), Nnanseh and Akpan (2013), Okafor (2012), Ravinthirakumaran (2011), Baghestani & McNown, 1994; Ewing & Payne, 1998; Fasano & Wang, 2002; Garcia & Henin, 1999; Hatemi-J & Shukur, 1999; Hondroyannis & Papapetrou, 1996; Katrakilidis, 1997; Kollias & Makrydakis, 1995, 2000; Li, 2001; Miller & Russek, 1990; Owoye, 1995; Shah & Baffes, 1994) based on cointegration and error correction models.

Literature Review

There are essentially three schools of thought on the direction of causation between government expenditure and revenue. Friedman (1978) leads the tax-and-spend school, which contends that raising taxes will simply lead to more spending. Friedman (1982) puts his point in the following way:

“You cannot reduce the deficit by raising taxes. Increasing taxes only results in more spending, leaving the deficit at the highest level conceivably accepted by the public. Political rule number one is government spends what government receives plus as much more as it can get away with.”

The spend-and-tax school advocates the antithesis of the tax-and-spend school. This school is built on the tenet that expenditure causes revenue. This view was expounded by Peacock and Wiseman (1961, 1979) who found that increases in government spending brought by crisis situations lead to permanent changes in expenditure. They are

The majority of the above studies investigate the nexus between government revenue and expenditure for developed countries, with most examining the US case. Recently, there have been studies for developing countries. Shah and Baffes (1994) investigated the nexus for Latin American countries and found bidirectional causality between government revenue and expenditure for Argentina. Fasano and Wang (2002) investigated the nexus for oil-dependent Gulf Cooperation Council countries and found bidirectional causality for Kuwait, Qatar and Saudi Arabia while they found evidence of Unidirectional causality running from revenue to expenditure in Bahrain, the United Arab Emirates and Oman. In a recent study Li (2001) looked at the case of China, using cointegration and error correction models over the period 1950–1997. He found bidirectional causality between government expenditure and revenue. As can be noted from the brief review of the findings, the evidence on the direction of causality is mixed.

The major objective of this study is to examine the government expenditure and government revenue for Kaduna State. The rest of the paper is organized as follows. In the next section, the study explains the theoretical underpinnings for analyzing the government revenue and government expenditure nexus. The study explains the methodologies used in this paper in the third section. In the fourth section, we discuss the empirical results, while in the final section we provide some concluding remarks together with some policy implications.

of the view that severe crisis that initially force up government expenditure, more than taxes, is capable of changing public attitudes about the proper size of government. This leads to a displacement of fiscal variables as some of the tax increases originally justified by the crisis situation become permanent tax policies.

The third school of thought argues that governments may change expenditure and taxes concurrently; this is known as the fiscal synchronization hypothesis (Meltzer & Richard, 1981; Musgrave, 1966). This implies bidirectional causality between government expenditure and revenue. Under the fiscal synchronization hypothesis, citizens decide on the level of spending and taxes. This is done through comparing the benefits of government to citizen's marginal cost. Barro's (1979) tax smoothing model provided further credence to the fiscal synchronization hypothesis. His model was based on the Ricardian equivalence view that deficit-financed government expenditure today results in future tax increases

Empirical Literature Review

Most of the studies above investigate the nexus between government revenue and expenditure for developed countries. Von Furstenberg (1986) investigated the nexus between government revenue and expenditure for the US over the period 1955–1981 and found expenditure Granger causing revenue. Anderson (1986) using post-war data for the US, corroborated the findings of Von Furstenberg et al. (1985). However, Manage and Marlow (1986) found some evidence of causality from revenue to expenditure, while Ram (1988) found bidirectional causality. However, the above studies have been based on conventional regression techniques.

Using cointegration and error correction models, Baghestani and McNown (1994) found a cointegration relationship between the variables but they found no evidence of any causality between revenue and expenditure over the period 1955 Q1 to 1989 Q4. In studying 22 industrialised countries, Joulfaian and Mookerjee (1991) found that revenue Granger caused expenditure in most of the countries except for Canada, Iceland and Japan. On causality running from expenditure to revenue they found this to be the case in all countries except for France, Greece and Ireland. Within a cointegration framework, Owoye (1995) investigated the issue for the G7 countries. He found bidirectional causality for five of the seven countries and for Japan and Italy he found causality running from revenue to expenditure.

Ho and Huang (2009) tested the hypothesis of tax-spend, spend-tax, or fiscal synchronization applies to the 31 Chinese provinces using panel data covering 1999 to 2005. Their results based on multivariate panel error-correction models show that there is no significant causality between revenues and expenditures in the short-run. However, in the long-run, bidirectional causality exists between revenues and expenditures, thus supporting the fiscal synchronization hypothesis for Chinese provinces over this sample period. Recently for developed country, Afonso and Rault (2009) investigated causality between government spending and revenue in the EU by new econometric technical bootstrap panel analysis in the period 1960-2006. Spend-and-tax causality is found for Italy, France, Spain, Greece, and Portugal, while tax-and-spend evidence is present for Germany, Belgium, Austria, Finland and the UK, and for several EU New Member States. Chang and Chiang (2009) consider a sample of 15 OECD countries test for the long-run relationship between government revenues and government expenditures over the period 1992-2006. They find evidence of bidirectional causality between government revenue and expenditure, supporting

the fiscal synchronization hypothesis by using panel cointegration, and panel Granger causality test techniques.

In related studies to Nigerian experience, Ezugwu and Agbaji (2014), they examined the contribution of internally generated revenue before tax payer identification number (TIN) on total tax revenue in Kogi State. The population of study comprises the Total Tax Revenue before TIN (TRBT) and Internally Generated Revenue before TIN (IGRBT). Tables and Regression were used to analysed the data and test the hypothesis formulated. The analysis of data revealed that, the internally generated revenue (IGR) before the introduction of TIN within (2003-2007) was not significant. The study recommended holistic tax education in order to keep the teeming taxpayers abreast of the need to pay their taxes to the state and the enforcement unit of the State Revenue Board should be properly empowered to monitor, enforce and prosecute any errant tax defaulters who fail to comply with tax authority.

Dada (2013) investigated the causality between government revenue and expenditure in Nigeria. The study employed Unit root, cointegration test, error correction model and granger causality test. The study revealed a long run cointegration relationship between revenue and expenditure. There was no causality found between revenue and expenditure therefore support institutional separation hypothesis.

Samuel and Tyokoso (2014) examined the assessment of taxation on revenue generation in Nigeria with focus on FCT and some selected states using survey research design. The study used regression analysis and found among other things that taxation has a significant contribution on revenue generation and gross domestic product (GDP). In a similar way, Afuberoh and Okoye (2014) utilize regression analysis and the study found a significant relationship between revenue generation through taxation and GDP. Okafor (2012) examined tax revenue generation and Nigeria economic development. The aim of the research work was to explore the impact of income tax revenue on the economic growth of Nigeria as provided by the gross domestic product (GDP). Ordinary least square regression method was adopted by the researcher to explore the relationship between GDP a proxy for economic growth and a set Federal Government income tax revenue heads from 1981 to 2007. However, found that there is a positive significant relationship between tax revenue and economic development in Nigeria.

Saolu, Dopemu and Monday, (2015), assessed the impact of tax reform on revenue generation in Lagos state. The study employed time series quarterly data between the period 1999 and 2012, obtained from tax payer’ s statistics and revenue report of Lagos State Board of Internal Revenue. Ordinary least square (OLS) was adopted for analysis. The study revealed that Lagos state

captured more people into the tax net as there was continues increase in tax payers commutative growth. The study revealed that 80% of the internally generated revenue in Lagos state is from tax. The study confirmed long run relationship between tax reform and revenue generation and concluded that tax reforms had positive impact on revenue generation in Lagos state.

Methodology

Vector Error Correction Model (VECM)

Evidence regarding a cointegrating relationship between government revenue and government expenditure is crucial for the correct specification of the model for testing Granger causality. For instance, the test is based on a vector autoregressive (VAR) model if there is no cointegration or on a vector error correction model

(VECM) if there is cointegration among the variables. In the presence of cointegration, to avoid ‘ spurious results, it is imperative to include an error correction term (ECT) in the stationary model in order to capture the short-run deviations of series from their long-run equilibrium path. The study adapted the study of Dada (2013) and modified the model to suit this study. Therefore, the cointegrated error correction models are as follows:

$$\Delta IGR_t = \beta_0 + \psi_{11}(L)\Delta IGR_t + \psi_{12}(L)\Delta IGR_t + \lambda ECT_{t-1} + \varepsilon_{1t} \tag{1}$$

$$\Delta GEP_t = \beta_0 + \psi_{21}(L)\Delta GEP_t + \psi_{22}(L)\Delta GEP_t + \lambda ECT_{t-1} + \varepsilon_{2t} \tag{2}$$

Where:

R=Government revenue at time t and GEP=Government expenditure at time t; L is the lag operator, implying that LGR = GR_{t-1}; ECT_{t-1} is the lagged error correction term derived from the long-run cointegrating relationship (this term is not included if the variables are not cointegrated); and ε_{1t} are ε_{2t} serially independent random errors with

a mean of 0 and a finite covariance matrix. The F-tests on the differenced explanatory variables depict the short term causal effects, whereas the significance or otherwise of the lagged error correction term denotes whether there is a long-run relationship.

Results and Discussion

This chapter presents and discusses the results of the study. The analysis commenced with descriptive statistics to reveal measurement of the variables in terms of mean, minimum and maximum values, variance and kurtosis. Further, a correlation test was conducted to ascertain the strength of relationship between the variables under study and the unit root for stationarity of the series. Having considered the level of integration of the variables, the ARDL bound test to co-integration to ascertain the long run nexus between the variables. The estimates of the ARDL models show the short run and long-run coefficients. The diagnostic test results to confirm the robustness of the estimates are also presented and discussed in this chapter.

Table 4.1: Descriptive Statistics

	LGEP	LIGR	LGBT
Mean	23.80491	22.16799	24.13797
Median	24.14753	22.68366	24.37301
Maximum	26.00607	24.63928	26.33903
Minimum	20.94677	19.93938	21.66237
Std. Dev.	1.718735	1.459980	1.655975
Skewness	-0.202135	-0.161597	-0.221821
Kurtosis	1.620089	1.722932	1.505414
Jarque-Bera	2.412187	2.024584	2.835705
Observations	28	28	28

Source: Author(s) Computation

The characteristics of the variables are presented in Table 1 using descriptive statistics. For government expenditure, the average for the period under study

is 23.89 and a standard deviation 1.72. This implies that there is a slim range of variation between the maximum amount and the minimum over the

period of study. In the case of internally generated revenue, the average received by the government for the period of study is 22.17 and a standard deviation of 1.46. A similar result was observed in the case of government budget. The normality test

represented by the Jarque-Bera test revealed that the variables are normally distributed and the skewness and Kurtosis are within the conventionally accepted region.

Table 2: Unit Root Test

Variable	Level		1 st Difference	
	Intercept	Intercept with Trend	Intercept	Intercept with Trend
LGBT	-0.942	-1.639	-6.204***	-4.355***
LGEP	-1.104	-3.665**	-6.301***	-6.368***
LIGR	-0.739	-3.343*	-6.707***	-3.695**

Source: Author(s) Computation

The unit root test was conducted to ascertain that none of the variables in this study are I (2) and also to confirm the level of integration of each of the variable. The results presented in Table 2 revealed that all the variable are free from unit root at first difference and none of the variable is an I(2) variable. Therefore, further analysis can be

conducted based on the outcome of the stationarity test. After checking the integration of our three variables at order one, I (1), the study selected the optimal lag length of underlying Vector Auto Regression (VAR henceforth) using the conventional model selection criteria. These criteria established that the optimal lag length is two.

Table 3: Correlation Matrix

	Government Budget	Government Expenditure	IGR
Government Budget	1	-	-
Government Expen.	0.987	1	-
IGR	0.948	0.950	1

Source: Author(s) Computation

The correlation results presented in table 3 shows the relationship between government budget, government expenditure and internally generated revenue in Kaduna State. Using the Gulfield rule of thumb, the results shows that the correlation

between these variables is strongly positive. This implies that government budget strongly depends on expenditure and government revenue and vice versa.

Table 4: Johansen Cointegration

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.785096	30.66648	29.79707	0.0396
At most 1	0.308994	6.065468	15.49471	0.6878
At most 2	0.009441	0.151766	3.841466	0.6968

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

The Johansen cointegration test results is presented in table 4 and it shows that there exist a longrun relationship between the variables under

consideration. This suggests that government expenditure and revenue have long run relationship in the case of Kaduna Sate.

Table 5: Causality Test

Error Correction:	D(LGBT)	D(LIGR)	D(LGEP)
CointEq1	-0.025	-0.431942	0.018681
	[-0.25904]	[-3.27102]	[0.15793]
D(LGBT(-1))	-0.191	0.470052	0.433061
	[-0.672]	[1.21204]	[1.24656]
D(LGBT(-2))	-0.123687	0.361041	0.377903
	[-0.37375]	[0.79834]	[0.93284]
D(LIGR(-1))	-0.003170	0.262350	-0.144368
	[-0.01680]	[1.01770]	[-0.62518]
D(LIGR(-2))	0.017375	0.327309	-0.236569
	[0.10672]	[1.47106]	[-1.18693]
D(LGEP(-1))	-0.127671	-0.993795	-0.777064
	[-0.45830]	[-2.61048]	[-2.27864]
D(LGEP(-2))	-0.088457	-0.814080	-0.449674
	[-0.38828]	[-2.61488]	[-1.61241]
C	0.263590	0.283672	0.334168
	[2.67517]	[2.10673]	[2.77045]

Source: Author(s) Computation

Having established evidence of cointegration for Kaduna State, in specifying the equations for Granger causality the study augments the VAR model with the lagged error correction term, as explained earlier. This allows us to derive both the speed of adjustment to equilibrium following a shock and the significance of the long-run. The Granger causality results are presented in Table 5. This result revealed that that there is causality between revenue and expenditure for Kaduna State and it flows from revenue to expenditure and not the other way round. This suggest that the causality

Conclusion and Recommendations

The study examined nexus between government expenditure and government revenue for Kaduna State. The study finds a long-run cointegration relationship between government revenue and government expenditure for the state. There is evidence of causality between government revenue and government expenditure, it flows from revenue to expenditure, but no causality between government expenditure and budget in Kaduna state. This implies a unidirectional causality from revenue to expenditure, supporting the tax and spend hypothesis. The outcome of the study therefore shows that in Kaduna State, expenditure decisions are not made in isolation from revenue decisions. This does not lead the State to potential budget deficits should government expenditure explore relative to government revenue.

is unidirectional not bidirectional in the case of Kaduna State.

On the error correction results, it is observed that deviation from the long-run equilibrium is mainly corrected by government revenue while government expenditure and budget appear to be weakly exogenous. This indicates the fact that any changes in the latter two variables that disturb long-run equilibrium are corrected by counter-balancing changes in the revenue. In this context, it may be concluded that budget is caused by revenue only.

Also, it follows that with escalating budget deficits in Kaduna state countries, one way of eliminating this deficit is by boosting government revenues. Therefore, the study recommends the following:

1. Kaduna state government should improve revenue and expenditure estimation methods and techniques in order to maximize revenue in state.
2. Kaduna state government should prune over bloated size of the government budget to be realistic with the revenue potential of the state.
3. There should be prudent in revenue collection mechanisms by the government, it will be of great important and crucial for sustaining budget deficits in Kaduna state.

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