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Revenue Allocation and Economic Development in Nigeria: An Empirical Study

Dagwom Yohanna Dang[1]

Abstract

This study empirically examines the impact of revenue allocation on economic development in Nigeria. Specifically, the study looks at how the various revenue allocations to the three tiers of government affect real gross domestic product (RGDP) in Nigeria using time series data for the period 1993 to 2012. Error correction model (ECM) and Pairwise Granger Causality test are used in analyzing the data. The study carries out test of stationarity of the variables using Augmented Dickey–Fuller unit root test and test of long-run relationship among the variables using Johansen Cointegration test. The study's findings show that revenue allocations have significant causal relationship with economic development in Nigeria, with only revenue allocation to states having significant negative relationship. Unidirectional causality runs from revenue allocations to real GDP in Nigeria. All variables of the study are cointegrated and have a long-run relationship that 87.62% of the short-run disequilibrium is corrected yearly. The study recommends among others that more financial control and value for money audit should be carried out to minimize wastages and corruption in the states of the federation, so as to change the direction of influence of states' revenue allocation on economic development.

Keywords

economic development, real gross domestic product (RGDP), revenue allocation, fiscal federalism

Introduction

Every government pursues economic development by trying to achieve macroeconomic objectives in a particular system of government. Various systems of government include federation, unitary, and confederation. The Nigeria's system favors federation. The federation of Nigeria achieves her macroeconomic objectives by performing the functions of resource allocation, income distribution/redistribution, and economic stabilization within the central government, that is, federal government and its units (states and local governments). This system of performing government functions in different tiers of government is called fiscal federalism (Buhari, 2001; Likita, 1999).

Fiscal federalism is a system of taxation and public expenditure in which revenue-raising powers and control over expenditure are vested in various levels of government within a nation, ranging from the national government to the smallest unit of local government (Anyafo, 1996). Basically, fiscal federalism emphasizes on how revenues are raised and allocated to different levels of government for development.

A large body of literature exists on Nigeria's fiscal federalism particularly with reference to revenue allocation. Despite the profound and lengthy discussions that have taken place on the subject for about four and half decades, consensus has not been reached concerning the optimal formula to adopt to achieve desired economic development (Aboyade, 1985; Buhari, 2001). Thus, the issue of revenue allocation has been a recurring theme in Nigeria's fiscal federalism.

There is the problem of how to allocate revenue to different tiers of government in relation to the constitutionally assigned functions. The discordance between fiscal capacity of various levels of government and their expenditure responsibilities, the noncorrespondence problem, is a striking feature of the Nigerian federal finance (Mbanefoh & Egwaikhide, 2000). There is also the problem of how revenue should be shared among the states and local councils.

Several studies mainly exploratory (such as Aluko, 2000; Ekpo, 2004; Khemani, 2001; Mbanefoh & Egwaikhide, 2000; Suberu, 2006; Uche & Uche, 2004) were carried out on how revenue is shared within the federal government, state governments, and local governments and the basis of sharing the revenue to these federating components. But these studies could not empirically study the impact of the

[1]Plateau State Polytechnic, Barkin Ladi, Nigeria

Corresponding Author:
Dagwom Y. Dang, Department of Accounting, Plateau State Polytechnic Barkin Ladi P. M. B. 02023, Bukuru, Plateau State, Nigeria or Dydang Consults Ltd, P.O. Box 6931, Anlo-Jos, Maiduma Estate, Behind Mr Biggs, Jos 930, Barkin Ladi, Nigeria.
Email: dagwom_2002@yahoo.com

revenue allocation on economic development of Nigeria. Other studies, such as Aigbokhan (1999), Jimoh (2003), Emengini and Anere (2010), Akeem (2011), and Usman (2011) carried out empirical studies on the effects of the level of decentralization of government activities including revenue allocation on Nigeria's economic development using econometric analysis. None of these studies to the best of my literature review utilized causality econometric test to ascertain the direction of causal relationship between the variables. However, this study intends to examine empirically how different revenue allocations over the years impacted on economic development of Nigeria and the causal relationship between the variables.

Review of Literature

Conceptual Framework

According to the resource allocation function of the government, revenue is allocated to federating units of a country for economic development, otherwise called fiscal federalism. Nigeria's fiscal federalism has emanated from historical, economic, political, geographical, cultural, and social factors. In all of these, fiscal arrangements remain a controversial issue in allocating distributable pool account (DPA) of the federation since 1946 (Ekpo, 2004).

A federation emerges either by aggregation of previously independent sovereignties to become a single sovereign state such as Australia, Canada, and United States, or by devolution, that is, decentralization of certain level of political authority to subnational governments within a sovereign state such as Nigeria, India, and Pakistan (Prest, 1975; Aboyade, 1985, as cited in Anyafo, 1996). Thus, along this line, fiscal federalism could be taken to mean a constitutional arrangement or a system of government where revenue and expenditure functions, otherwise called fiscal responsibilities, are divided among the tiers/levels of government, that is, federal, state, and local governments (Akindele, 2002; Likita, 1999; Wheare, 1944). In undertaking this division, economics emphasizes the need to focus on the necessity for improving the performance of the public sector and the provision of their services by ensuring a proper alignment of responsibilities and fiscal instruments.

The Nigerian Federal system plays a preeminent role in this distributive process. Succinctly, owing to its explicit legitimation and accommodation of sectional-territorial constituencies, the federal system provides the structural and institutional framework for the organization and mediation of the ethnic competition for public resources in Nigeria (Suberu, 1994, 2000). To understand the concept of revenue allocation, public revenue must be defined. Public revenue is the income that accrues to the government to finance its economic activities. This can be raised from different sources that include taxation, loans, sale of public assets, grants and aids, gifts and donations (Likita, 1999). Stephen and Osagie (1985) share the same view on public revenue but broadly classified the sources into tax revenue and nontax revenue. The revenue generated within the federation jurisdiction is shared to the federating units.

Olowononi (2000) broadly defines revenue allocation to include allocation of tax powers and the revenue sharing arrangements not only among the three levels of government but among the state governments as well. Under government's distribution function, it redistributes incomes and resources to promote national unity and equity (Jimoh, 2003). Revenue allocation can be described as a method of sharing the centrally generated revenue among different tiers of government and how the amount allocated to a particular tier is shared among its components for economic development.

Economic development is simply a term used to refer to the economic well-being of a country by promoting economic growth and good standard of living. Adams (2006) defines economic development as the elimination or reduction in poverty, inequally, and unemployment within a growing economy. Mansell and Wehn (1998) say that economic development involves economic growth, namely the increase in per capita income and attainment of standard of living equivalent to that of industrialized nations. Musgrave and Musgrave (2004) lend credence to the fact that the requirements for economic development in low-income nations include those needed for consistent economic growth as compared with highly developed nations. In the above definitions, economic growth stands as a transiting phenomenon via which economic development is achieved. This means that there cannot be economic development without economic growth but there can be economic growth without economic development. This situation is evidenced in so many less developed countries (LDCs) like Nigeria. Economic growth is the increase in real GDP and this study considers it as economic development indicator.

Theoretical Framework

Revenue allocation is expected to grow the economy as explained by growth theories. The neoclassical economists are instrumental in the development of the growth theory. Solow (1956) develops a growth model called the Solow model that explains that the long-run rate of growth is exogenously influenced by the rate of technical progress. Whereas Domar (1957) establishes the Harrod-Domar model in which the long-run growth rate is exogenously determined by the savings rate in an economy.

Modification of the neoclassical growth theory became possible due to its shortcomings: the inability of the growth model to explain savings rate and rate of technological progress as exogenous factors. A new growth theory was introduced in the early 1980s as endogenous growth theory (Akanbi & Du Toit, 2011). Endogenous growth theory says that economic growth depends primarily on endogenous

factors, such as human capital, innovations, knowledge, and positive externalities (Romer, 1994). The endogenous growth theory holds that policy measures within an economy, such as revenue allocations positively influence the long-run growth rate of an economy, such as increase in real GDP. This study adopts the endogenous growth theory/model for its analysis.

Revenue Allocation: The Nigerian Experience

Revenue is allocated to the Nigeria federating units to meet up with their various constitutional assigned expenditures. Since Nigeria became independent in 1960, the assignments of government functions among the three tiers of government have not changed significantly except for few exceptions during the military regimes. Several constitutions of the Federal Republic of Nigeria contain decentralization of functions; the exclusive list contains the functions reserved for the federal government only, whereas the concurrent list has the functions for the federal and the state governments and where there is a conflict, the federal government shall prevail. The functions reserved for the states are found in the residual list.

A number of changes had occurred with respect to who has the right to revenues. The most significant is probably that of mining rents and royalties. Before 1959, regional governments have rights to 100% of mining rents and royalties but with the production and exploration of oil in 1958, and following Raisman Commission recommendations in 1959, revenue from mining rents and royalties was distributed as follows: mineral regions, 50%; Federal, 20%; and DPA, 30% (Adedeji, 1969). Another change that is significant was in 1994 on sales tax that states (or regions) hitherto had 100% right. This was replaced by Value Added Tax (VAT) and is to be federally collected (Jimoh, 2003). Today, federal government has the right to 35% of this revenue. In virtually all cases, the changes have been in favor of the federal government at the expense of the regions.

Since 1946 when the first seed of federalism was sown in Nigeria, all major constitutional changes and/or changes in administration have been associated with attempts to modify or change the revenue sharing rights of the different tiers of government (Ovwasa, 1995). This revenue sharing is in the form of vertical allocation (i.e., along the federal, states, and the local governments) and horizontal allocation (i.e., within states or local governments). About nine fiscal commissions were appointed to examine Nigeria revenue sharing arrangements between 1948 and 1988. These include Philipson (1948), Hicks (1952), Chick (1954), Raisman (1959), Binns (1964), Dina (1968), Aboyade (1977), Okigbo (1979), and Danjuma (1988) commissions (Akindele, 2002; Ekpo, 2004; Jimoh, 2003; Ovwasa, 1995; Udeh, 2002). The recommendations of these commissions had often influenced the revenue sharing formula adopted at the respective periods. They determined the tiers of government that have rights to revenues collected. Presently, the constitutionally created Revenue Mobilization and Fiscal Commission influence revenue allocation in Nigeria. Over the years, revenues collected were allocated to influence economic growth and development in the country.

Review of Major Empirical Studies

Martinez-Vazquez and McNab (2002) in a study finds out that allocation of revenue significantly reduces the growth of real GDP per capita in developed countries. A similar cross-country study on fiscal decentralization in unitary and federal countries for the period 1971-1990 using annual data, Yilmaz (2000) finds that decentralization results in growth of real GDP per capita in the unitary countries and decentralization is insignificant to influence growth of real GDP per capita in federal countries. These studies are based on foreign economies.

In Nigeria, Akinlo (1999) finds that state governments' public expenditures are influenced by federal grants during the period of study using ordinary least squares (OLS) technique. Similarly, in the study of Akujuobi and Kalu (2009), using the same econometric technique (OLS) finds significant effects of statutory allocation on financing states' real assets investment. Aigbokhan (1999) finds a significant relationship and a high concentration ratio of expenditure and revenue using OLS technique to examine fiscal decentralization and economic growth in Nigeria. The impact of fiscal decentralization of revenue to individual federating units on economic growth of Nigeria is demonstrated in the studies of Akeem (2011) and Usman (2011), both utilizing OLS technique. Usman (2011) finds that both shares of federal government and local governments' revenue from federation account contribute to economic growth process in Nigeria. The study finds no contribution of share of states revenue from federation to economic growth process in Nigeria, which is contrary to the findings of the studies of Akinlo (1999) and Akujuobi and Kalu (2009). Usman (2011) uses the growth rate of shares of the federating units from federation account as proxies and finds direct relationship between revenue allocations to federal, states, and local governments and economic growth process in Nigeria. All of these studies made use of OLS econometric technique which does not show causality and direction of causality.

Other studies (such as Emengini & Anere, 2010; Olofin, Olubusoye, Bello, Salisu, & Olalekan, 2012) use different analytical techniques such as *t*-test correlation coefficient and cluster analysis, respectively, to examine revenue allocation in Nigeria. Emengini and Anere (2010) find no influence to socioeconomic status of states and local councils by the level of revenue accruing to them from the federation account. In Olofin et al. (2012), the results show a small number of states constituting each of the clusters in terms of statutory allocation. Jimoh (2003) utilizes a causality test using Error Correction Model (ECM) to ascertain the

long-run causal relationship and short-run dynamics between the degree of decentralization and economic growth in Nigeria. He finds out that more decentralized governance, in terms of increase in number of local governments and increase in transfer of revenue from federation account to states and local governments influence economic activities and growth in Nigeria. Jimoh refuses to carry out preliminary test of time series data using unit root test and cointegration test. However, the present study differs from Jimoh because it adopts the preliminary test of time series data, and ECM and Pairwise Granger Causality test to ascertain the causal relationship and the direction of causality between revenue allocations and real GDP in Nigeria.

Methodology and Model Specification

This study uses econometric techniques to analyze historical time series data. These econometric techniques include: Augmented Dickey–Fuller (ADF) to test for a unit root in the individual data series (Dickey & Fuller, 1981); Johansen Cointegration to test for the integration of all the data series (Johansen, 1991); ECM to estimate the model; and Pairwise Granger Causality Test to determine the direction of causality between revenue allocation and economic development in Nigeria (Engle & Granger, 1987). The proxy for economic development for this study is Real Gross Domestic Product (RGDP) as used by Jimoh (2003) and revenue allocation is proxied by revenue allocation to federal government, revenue allocation to the state governments, and revenue allocation to the local governments as used by Emengini and Anere (2010), and Akeem (2011). These proxies are based on the endogenous growth model.

The major source of data for this study is Statistical Bulletin. Time series data (1993-2012) for all the proxies of revenue allocation and economic development were obtained from the Central Bank of Nigeria's (CBN; 2012) Statistical Bulletin.

Empirical studies such as Egwaikhide, Chete, and Falokun (1994); Aruwa (2011); Bruckner (2010); and Oluwatobi and Ogunrinola (2011) used vector autoregression (restricted or unrestricted) analysis to assess the relationship between economic variables. These studies adopted a time series model and this study takes after them. Thus, the basic model of this study is presented below:

$$\text{RGDP} = \text{RGDP}(\text{REVALFGN}, \text{REVALSTATES}, \text{REVALLG}),$$

$$\Delta\text{LRGDP}_t = \beta_o + \beta_1\Delta\text{LREVALFGN}_{t-1} + \beta_2\Delta\text{LREVALSTATES}_{t-1} + \beta_3\Delta\text{LREVALLG}_{t-1} + \beta_4\text{ECT}_{t-1} + \mu_t$$

where LRGDP = log of RGDP; LREVALFGN = log of revenue allocation to federal government of Nigeria; LREVALSTATES = log of revenue allocation to state governments; LREVALLG = log of revenue allocation to local governments; β_0 is a constant; β_1, β_2, β_3, and β_4 are coefficients of the regression model; ECT is the error correction term; μ is the error term (disturbance term); and t is time. The ECM is used to test the following hypothesis:

H_0: Revenue allocations have no significant causal relationship with economic development (RGDP) in Nigeria.
H_1: Revenue allocations have significant causal relationship with economic development (RGDP) in Nigeria

where $H_0 = \beta_1, \beta_2, \beta_3, \beta_4 = 0$
$H_1 = \beta_1, \beta_2, \beta_3, \beta_4 \neq 0$.

Results and Discussion

Before carrying out regression analysis, there is the need to conduct a unit root test to ascertain the stationarity of the variables. This will identify the order of integration. The ADF test was used for the unit root test, and the following results were obtained.

Table 1 shows the results of the ADF test carried out. The unit root test reveals that all the variables are stationary at different stages, that is, LRGDP is of order 1(2), LREVALFGN is of order 1(1), LREVALSTATES is of 1(1), and LREVALLG is of order 1(2); therefore, it is necessary to carry out the cointegration test to ascertain whether the variables have a long-run relationship.

Table 2 presents the Johansen cointegration results and the results show cointegrating equation(s) at .05 level of significance in the Trace test and Max-Eigen test. This means that there is a long-run relationship existing within the variables under study.

The p value of the ECM in Table 3 shows a .05 level of significance (p value of the model = .0000). This means that H_0 is rejected at .05 level of significance, meaning that the lag values of all the independent variables (revenue allocations to federal government, states, and local governments) jointly impact on RGDP of Nigeria for the period 1993 to 2012. All the focused independent variables (REVALFGN, REVALSTATES, and REVALLG) individually and significantly influence RGDP in Nigeria for the period 1993 to 2012, with only revenue allocation to states showing a negative significant result. This is evidenced in the individual variables' p values (see Table 3). The R^2 in the model is showing that 99.62% of variability in economic development (RGDP) is explained by the lag values of revenue allocations in Nigeria. Durbin–Watson is showing 1.926131, meaning that there is no sign of serial correlation in the model.

The coefficient of the error correction term appears with the appropriate negative sign and statistically significant at 5% level after estimation. This is in agreement with the result of the Johansen Cointegration test, which shows a long-run relationship among the variables. The result of the ECM estimation has shown that about 87.62% of previous years'

Table 1. Augmented Dickey–Fuller Stationarity Test Results.

S/No.	Variable	ADF *t* statistics (*p*) Level	1st and 2nd difference	Critical value	Decision rule
1	LRGDP	−0.009056 (.9458)	−2.510221(1st) (.1295) −5.152918(2nd) (.0008)	1% = −4.532598 5% = −3.673616 10% = −3.277364	Order 1(2): Stationary at 2nd Difference
2	LRREVALFGN	−2.781409 (.2197)	−8.337512 (1st) (.0000)	1% = −4.532598 5% = −3.673616 10% = −3.277364	Order 1(1): Stationary at 1st Difference
3	LREVALSTATES	−1.254249 (.8681)	−4.109039 (1st) (.0235)	1% = −4.532598 5% = −3.673616 10% = −3.277364	Order 1(1): Stationary at 1st Difference
4	LREVALLG	−1.954406 (.5876)	−3.331389(1st) (.0947) −6.124522(2nd) (.0008)	1% = −4.532598 5% = −3.673616 10% = −3.277364	Order 1(2): Stationary at 2nd Difference

Source. Authors' computation using EViews 7 computer software. ADF = Augmented Dickey–Fuller.

Table 2. Johansen Cointegration Results.

Date: 06/17/13 Time: 06:00
Sample (adjusted): 1995 2012
Included observations: 18 after adjustments
Trend assumption: Linear deterministic trend
Series: LRGDP LREVALFGN LREVALSTATES LREVALLG
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace statistic	.05 critical value	*p***
None*	0.843288	70.18805	47.85613	.0001
At most 1*	0.641527	36.82787	29.79707	.0066
At most 2*	0.427419	18.36162	15.49471	.0180
At most 3*	0.370286	8.324814	3.841466	.0039

Trace test indicates 4 cointegrating equations (CE) at the .05 level
*Denotes rejection of the hypothesis at the .05 level
**MacKinnon-Haug-Michelis (1999) *p* values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen statistic	.05 critical value	*p***
None *	0.843288	33.36018	27.58434	.0081
At most 1	0.641527	18.46625	21.13162	.1134
At most 2	0.427419	10.03681	14.26460	.2095
At most 3 *	0.370286	8.324814	3.841466	.0039

Max-Eigenvalue test indicates 1 cointegrating equation(s) at the .05 level
*Denotes rejection of the hypothesis at the .05 level
**MacKinnon-Haug-Michelis (1999) *p* values

Source. Author's computation using EViews 7 computer software.

Table 3. Error Correction Model (ECM) Estimates.

Dependent Variable: LRGDP
Method: Least Squares
Date: 06/21/13 Time: 15:05
Sample (adjusted): 1994 2012
Included observations: 19 after adjustments

Variable	Coefficient	*SE*	*t* statistic	*p*
C	4.239953	0.059301	71.49927	.0000
LREVALFGN −(1)	0.060958	0.024539	2.484124	.0263
LREVALSTATES (−1)	−0.128761	0.035299	−3.647681	.0026
LREVALLG (−1)	0.341520	0.031073	10.99073	.0000
ECT (−1)	−0.876240	0.083265	10.52349	.0000
R^2	.996247	*M* dependent var		5.668626
Adjusted R^2	.995175	*SD* dependent var		0.177259
SE of regression	0.012313	Akaike info criterion		−5.735401
Sum squared residue	0.002123	Schwarz criterion		−5.486864
Log likelihood	59.48631	Hannan–Quinn criterion		−5.693338
F statistic	929.1236	Durbin–Watson statistic		1.926131
Prob (*F* statistic)	.000000			

Source. Author's computation using EViews 7 computer software.

disequilibrium is corrected each year from the long-run elasticity of the explanatory variables (see Table 3).

Moving further to test direction of causality using pairwise Granger Causality test, revenue allocation to federal government, revenue allocation to states, and revenue allocation to local governments granger cause real GDP in Nigeria and no

Table 4. Residual Statistics.

Residual test	Type of test	*F* statistics (*p*)
Heteroskedasticity Test	Breusch–Pagan–Godfrey Heteroskedasticity test	1.318840 (.4095)
Serial Correction Test	Breusch–Godfrey Serial Correlation LM test	0.8681 (.7592)
Normality Test	Jarque–Bera Normality test	3.437385 (.1793)

Source. Author's computation using EViews 7 computer software.

Table 5. Pairwise Granger Causality Tests Results.

Pairwise Granger Causality Tests
Date: 06/21/13 Time: 14:09
Sample: 1993 2012
Lags: 1

Null hypothesis:	Observation	*F* statistic	*p*
LRGDP does not Granger Cause LREVALFGN	19	2.17318	.1598
LREVALFGN does not Granger Cause LRGDP		4.74041	.0448
LRGDP does not Granger Cause LREVALLG	19	0.08395	.7757
LREVALLG does not Granger Cause LRGDP		12.3048	.0029
LRGDP does not Granger Cause LREVALSTATES	19	0.01909	.8918
LREVALSTATES does not Granger Cause LRGDP		22.0734	.0002

Source. Author's computation using EViews 7 computer software.

feedback from real GDP (see Table 5). However, the results show a unidirectional causality, running from revenue allocations to economic development in Nigeria.

In summary, the variables of this study, that is, real GDP, revenue allocation to federal government, revenue allocation to states and revenue allocation to local governments have a long-run relationship among them for the period 1993 to 2012 in Nigeria. This is consistent with the study of Jimoh (2003). Revenue allocations have a causal relationship with real GDP and significantly influence real GDP in Nigeria at different directions, with revenue allocation to states having a significant negative relationship.

The findings of this study gain support from the studies of Akinlo (1999), Aigbokhan (1999), Jimoh (2003), Akujuobi and Kalu (2009), and Usman (2011) in terms of revenue allocation to federal government and local governments, and agrees with the findings of Emengini and Anere (2010) and Akeem (2011) as regards share of revenue allocation to states for the Nigerian case.

Conclusion and Recommendations

From the findings, this study concludes that revenue allocations to federal government, states, and local governments have a causal relationship with economic development in Nigeria with only revenue allocation to states having a negative significant relationship. It therefore adopts a position that causality runs from revenue allocations (to federal, states, and local government) to real GDP in Nigeria and no feedback from real GDP, resulting to unidirectional causality. This is a conclusive result from the empirical analysis that also finds that there exists a long-run relationship among the variables of the study. The study recommends as follows:

1. More financial control, fiscal discipline, and value for money audit should be embarked by all tiers of government but with more emphasis to state governments so as to correct the direction of the relationship between revenue allocation to states and real GDP.
2. The continuous agitation for more revenue allocation to states should be reviewed properly by federal government and state governments to ensure change of direction of the impact of it on real GDP, that is, from negative impact to positive impact of the increment.
3. There should be a review of the 1999 Constitution of the Federal Republic of Nigeria to enhance the participation of states in fiscal policy, so as to give states more tax powers and expenditure jurisdictions to stabilize the economy for increase in real GDP. This will reduce the dependence of states on federation account and open new revenue sources.

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Author Biography

Dagwom Y. Dang is a lecturer with the Accounting Department, Plateau State Polytechnic, Barkin Ladi, Plateau State, Nigeria. He is a chartered accountant and a consultant with Dydang Consults Limited, Jos, Nigeria. He is a graduate of economics and currently an MSc accounting and finance research student (Awaiting external thesis defence) of the Accounting Department, Nasarawa State University, Keffi, Nigeria.