Financial, Public and Regional Economics

Local Decentralisation and Economic Growth in Nigeria

Hammed Adetola Adefeso[1]

Abstract: The current global drive towards devolution of financial resources and responsibilities has been increasingly justified on the basis that greater transfers of these financial resources and responsibilities to sub-central governments are theoretically expected to deliver greater economic efficiency in the provision of public goods and services and hence greater economic growth. There is a mixed result on these theoretical expectations across earlier empirical literatures. Using the instrumental variables (IV) technique of analysis with the recent data from Nigeria for the period 1970-2013, this study found no robust significant effect of the decentralisation of spending or revenue on growth of real GDP per capital in Nigeria. The implication of this to the policy makers is that when it comes to the determinants of improved economic activities, decentralisation either fiscal expenditure or revenue side would not be instrumental to economic growth possibly because of existence of endemic corruption among politicians in Nigeria.

Keywords: Local Decentralisation, sub-central government, economic growth, Nigeria

JEL Classification: C3; H77

1. Introduction

Nigerian and other African governments have undergone repeated decentralisation reforms as many developing countries have a mandate to decentralize aspects of their public finance and concurrently, there has been a considerable debate in the developed countries such as the United State and OECD countries in the recent years on the merits of such fiscal decentralization. Much of these recent movements devolving of revenue collection and expenditure to local authorities have been driven by belief that fiscal decentralization enhances government efficiency in the public sector, cut the budget deficit, enhance service delivery and economic growth as first expressed by Tiebout (1956) and others studies like Oates (1972; 1999), Xie et al (1999). Generally, such transfer of fiscal power, responsibility and resources to lower tiers of government allows for even regional development in terms of provision of public goods and services to meet local needs and this will in turn reduce poverty level and promote overall economic

[1] Department of Local Government Studies, Obafemi Awolowo University, Nigeria, Address: Ile-Ife, Osun State, Nigeria, Tel.: +2348038063669, Corresponding Author: adefesoha@yahoo.com.

performance. This is because government at lower levels have informational advantages over the central government concerning the improved and efficient resource allocation (Oates, 1972) and therefore they are in a better position to identify and deliver the kind of public goods and services that match local preferences and needs and over time efficiency gains will lead to the development of local as well as national economy at large.

Other scholars however, have challenged the significance of the economic efficiency of fiscal decentralization on service delivery of local government, reduction of poverty level and economic growth and development. They are of opinion that the informational advantage claimed by local government may not be significant because the central government may appoint its representatives to local offices where they purposely to gain the knowledge about local preferences under fiscal centralized system, so the government at the centre delegates and not devolves of fiscal responsibilities as in the case of fiscal decentralization. Even the central government can also involve worker at sub-central governmental level during the decision making process, this will influence resource allocative efficiency. The local government officials are not adequately trained most especially in the developing countries, this is because they are not elected into office through a democratic election and if they are, there is still the problem of availability of greater incentive to process information (World bank, 1995). It has also been argued that the control of macroeconomic and in particularly corruption at lower levels of government would be more difficult as it gives room for politicians to embezzle public funds (Suleiman, 2009).

Following this theoretical disagreement is the empirical estimation which tends to be ambiguous and inconclusive as a result of differing results. For example, while a strand of argument asserts confidently for single-country studies there exist positive and significant relationship between fiscal decentralisation and economic growth(Nguygen and Anwar, 2011) that fiscal decentralisation does not have economic impact because of the benefits derived from economies of scale in the provision and delivery of public goods (Thieben 2000), the study of Davoodi and Zou (1998) concluded that fiscal decentralisation is negatively correlated to economic activity in developing countries but has no significance in developed countries compared with findings of Prud'homme (1995) who argued that fiscal decentralisation is fundamentally suitable for developed countries and also compared with the conclusion of Enikolopov and Zhuravskaya (2003) which revealed significantly positive effect of fiscal decentralisation for developing countries alone. The evidence is that the link between decentralization and growth is not straightforward and is largely influenced by country specificities, as well as process design. Despite this, 63 of 75 transition and developing economies with populations of 5m people are either have granted or in the process of granting fiscal decentralization policy by transferring financial resourses and responsibilities to

local government. (Woller and Philips, 1998; Rodriguez-Pose and Kroijer, 2009)

Obviously, whether or not there is any significant growth and efficiency gained associated with fiscal decentralization can never be settled merely on theoretical grounds alone. It must be subjected to rigorous empirical analysis (World bank, 1995) which is the thrust of this study. Most of the existing studies on the subject matter have been narrowly concerned with analysing the trend of intergovernmental relations within the limited context of political economy or using merely narrative and descriptive analysis to establish differential or unequal allocation of revenue and functions among tiers of government (see for example Suberu 1991, Akindele and Olaopa 2002) and impact of such on the Nigerian economy. And this has equally led to the review with a view of finding appropriate revenue formula in Nigeria which is one of the most decentralized countries in the continent. This methodology is grossly inadequate in analyzing Fiscal Decentralization-Economic Growth nexus (World Bank, 1995) which is scarcely explored (Breuss and Eller, 2004) most especially in developing country and hence this study.

Moreover, several studies have employed Ordinary Least Squares (OLS) estimation technique to empirically examine the impact of fiscal decentralisation on economic growth despite the fact that a number of studies have identified the possibility of reverse causality and endogeneity among fiscal decentralisation and economic growth (see for example, Adefeso and Saibu 2014, Jin, et al. 2005, Thiessen (2003), Martinez-Vazquez and McNab 2003, Xie et al. 1999, Zhang and Zuo 1998). Specifically, Adefeso and Saibu (2014) and Martinez-Vazquez and McNab (2003) argue and concluded that reversal causality exists because efficiency and other benefits derives from fiscal decentralisation emerge as countries grow and develop. However, existing literature does not control for this endogeneity and this has made the OLS estimates to be biased and not consistent. This study departs from other studies by catering for the problem of endogeneity through the application of Two-Stage Least Square (TSLS) on the over-identified equations. The remainder of the paper is structured as follows: Section 2 focuses on Empirical Literature Review surrounding the fiscal decentralisation and economic growth nexus. Theoretical Framework and Methodology are discussed in section 3 and the study is wrapped up by section 4 which focuses on empirical results and concluding remark.

2. Empirical Literature Review

The following table provides the summary of conflicting results of the main studies on fiscal decentralisation and economic growth nexus on time series analyses up till date.

Table 2.1. Summary of Single Country Empirical studies on the Fiscal Decentralisation Policy and Economic Growth nexus

Studies	Countries	Period	Main results
Hammond, Tosun (2009)	United State	1970-2000	Revenue decentralisation is positive for income growth in metropolitan areas (10% increase in centralisation decreases growth by 0.28%), but has no effect overall
Qiao et al. (2008)	China	1985-1998	Fiscal decentralisation has enhanced growth but the relationship between the two variables is non-linear.
Akai, Nishimura, Sakata (2007)	United State	1992-1997	Non linear, humped-shaped relationship between fiscal federalism and growth. The optimal degree of fiscal decentralisation is higher than what is observed for the revenue-share, hence the US would gain in terms of growth from more fiscal decentralisation on the revenue side.
Hammond, Tosun (2006)	United State	1970-2000	Relatively weak or negative relationship in non-metropolitan areas as opposed to positive impact in metropolitan areas.
Solle-Olle, Esteller-More (2006)	Spain	1977-1998	Fiscal decentralisation is positive for road and educational investment and capital stock, and should therefore be beneficial to growth.
Cantarero, Perez Gonzales (2009)	Spain	1985-2004	No relationship between expenditure decentralisation and growth. Positive relationship between revenue decentralisation and growth.10% increase in revenue decentralisation adds 0.5% to GDP per capita growth. No evidence of non-linearities.
Huang, Cheng (2005)	China	1996-2004	

Zhang and Zou (1998)	28 Chinese Provinces	1987-1993 Annual Data	The direct effect of fiscal decentralisation on growth has been negative. But squared terms suggest non-linear, U-shaped relationship. In highly centralised countries, fiscal decentralisation decreases growth; however this effect becomes smaller with higher decentralisation; and above a certain threshold additional decentralisation is beneficial for regional growth. Decentralization of expenditure to the provinces reduces growth of real GDP per capita.
Lin and Liu (2000)	28 Chinese Provinces	1970-1993 Annual Data	Revenue decentralization by 10% increases growth of real GDP per capita by 2.7%-points (5% signif-cance level)
Carrion-i-Silvestre et al. (2008)	Spain	1980-1998	Fiscal decentralisation has a positive effect both on regional and national economic growth. The effect of the expenditure side is stronger than the revenue side.
Malik, Hassan, Hussain (2006)	4 province of Pakinstan	1971-2005	Both the expenditure share and the own revenues share have a positive and significant effect on growth (estimated oefficients are 0.54 and 0.62 respectively.
Jin, Qian and Weingast (2005)	29 Chinese Provinces	1982-1992 Annual Data	When grants are included in SCG revenues the effect of revenue decentralisation is however found to be negative (-0.17) but insignificant. Expenditure decentralization by 10% increases growth of real GDP per capita by 1.6%-points (10% significance level)
Akai, Nishimura, Sakata (2004)	50 states of United State	1992-1997	Fiscal decentralisation has positive effect on economic growth and negative effect on economic volatility.
Akai, Sakata (2002)	50 states of United States	1992-1996	Decentralisation has a positive impact on state gross product. Increase in expenditure decentralisation by 10% increases growth by 1.6-3.2 percentage points.
Qiao, Martinez	28 Chinese	1985-1998	

Vazquez and Xu (2002)	Provinces		Expenditure decentralization increases growth of nominal GDP per capita significantly (5% significance level)
Feltenstein and Iwata (2005)	Central Level in China	1952-1996	Fiscal decentralization has adverse implications for macroeconomic stability but tends to increase growth
Jin and Zou (2005)	30 Chinese Provinces	1979-1999	Divergence between local expenditures and revenue (i.e. centralization) increases growth
Zhang and Zou (2001)	29 Chinese Provinces	1987-1993, annual data	Decentralization reduces economic growth
Zhang and Zou (2001)	16 Indian States	1970-1994	Decentralization increases economic growth
Desai, Freink-man and Gold-berg (2003)	80 Russian Regions	1996-1999	Decentralization has a positive but non-linear effect on growth
Naumets (2003)	24 Ukrainian Oblasts and Autonomous Republic of Crimea	1998-2000	Not robust negative impact of own revenue decentralization on growth of real gross value added
Xie, Zou and Davoodi (1999)	Central Level in the USA	1951-1992	No significant impact of expenditure decentralization on growth of real GDP per capita
Akai and Sa-kata (2002)	50 US States	1992-1996, Cross-Section of Average Growth Rates, Panel with Annual Data	Expenditure decentralization by 10% increases growth of GDP per capita by 1.6-3.2%-points (robust 10% significance levels)
Stansel (2005)	314 US Metro-politan Areas	1960-1990	Higher fragmentation is associated with significantly higher growth in (log) real per capita money income.
Berthold, Drews and Thode (2001)	16 Laender	1991-1998	Higher horizontal and vertical grants significantly reduce growth of nominal GDP per capita
Behnisch, Buttner and Stegarescu (2002)	Central Level in Germany	1950-1990	Increase of federal share of expenditure in total expenditure has positive effect on German productivity growth
Gil-Serrate and Lopez-Laborda (2006)	17 Spanish Autonomous Communities	1984-1995	Revenue control decentralization has a positive effect on decentralization
Feld, Kirch-gassner, and Schaltegger (2004, 2005)	26 Swiss Can-tons	1980-1998	Tax autonomy and tax competition are not harmful for economic growth
	Both cross-		There is no evidence of direct link

Feld, Schnellenbach (2009)	country and within-country		between fiscal decentralisation and growth
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Feld, Kirch-gassner, and Schaltegger (2004, 2005)	26 Swiss Can-tons	1980-1998	Tax autonomy and tax competition are not harmful for economic growth
Feld, Schnellenbach (2009)	Both cross-country and within-country		There is no evidence of direct link between fiscal decentralisation and growth

Source: Author collection (2014)

3. Theoretical Framework and Methodology

The theoretical model of fiscal decentralisation and economic growth assumes without loss of generality, three levels of government namely federal, state and local. Fiscal decentralisation level is the spending by sub-national governments as a fraction of the total government spending. For instance, fiscal decentralisation increases if spending by state and local governments rises relative to spending by the federal government. Barro (1990) presents the production function where the interaction between private capital and public services are elegantly captured. This simple model explores a link between public services and economic growth. In this model, the government uses income tax revenues to finance public services which are considered to be inputs to private production. It is this complementarity between public services and private capital that creates a potentially positive

linkage between public services and economic growth in the model. The models specifically shows that spending on public services which enhance the productivity of the private capital or firms that creates a potentially positive linkage between public services and economic growth in the model as shown below:

$$y = Ak^a g^b \text{...1}$$

where y stands for economic growth, k is the private capita and g is the publicly provided services. a, b, c and d measure parameter efficiency.

This study however departs from Barro model and follows Davoodi and Zou (1998) by assuming that public spending is carried out by three levels of government namely: federal, state and local. Assume that k represents private capital, g is the total public spending on the provision of public services and it is the composition of f, federal government spending, s, state government spending and l, local government spending. i.e.

$$g = f + s + l \text{...2}$$

The resulted production function is Cobb-Douglas production function exhibits constant return to scale as specified below:

$$y = k^a f^b s^c l^d \text{...3}$$

where $a + b + c + d = 1$ and $0 < a, b, c, d < 1$, $0 < b < 1$, $0 < c < 1$, $0 < d < 1$. The total government spending, g, among different levels of government takes the following form:

$$f = m_f g, \qquad s = m_s g, \qquad l = m_l g \text{.................................4}$$

where $m_f + m_s + m_l = 1$ and $0 < m_i < 1$ for i = f, s, and l. m_f is the share of federal government in total spending, m_s and m_l are the share of state and local government in total spending respectively. The consolidated government spending g is financed by a flat output tax at rate τ:

$$g = \tau y, \qquad \tau = g/y \text{...5}$$

in order to derive the long-run growth rate of the economy, the analysis of the decision made by the private sector is crucial. Taken the government's decisions on τ as given, a long-lived representative individual who maximizes his discounted utility,

$$\text{Max U} = \int_0^\infty \frac{c^{1-\sigma}-1}{1-\sigma} e^{-pt} dt, \text{...6}$$

where c is the consumption of the public goods and services produced in this economy; σ is the inverse of the intertemporal elasticity of substitution and p is the

rate of time preference. The dynamic budget constraint the consumer faces is:

$$\acute{k} = \frac{dk}{dt} = (1 - \tau)y - c \equiv (1 - \tau)\,k^a\,f^b\,s^c\,l^d - c \,............................7$$

given the total government spending g, a constant tax rate τ, and the shares of spending by different levels of governments m_i's, where i = f, s, l. The representative agent's choice of consumption is determined by equation 6 subject to equation 7 and the government's budget allocation. The consumer then chooses optimally the consumption path {c(t): t ≥ 0} and path of the capital stock {k(t) : t ≥ 0} which characterised balanced growth path. The consumer's optimal allocation of resources is derived through Hamiltonian:

$$L = \left(\frac{c^{1-\sigma}-1}{1-\sigma}\right) + \lambda\left\{(1 - \tau)k^a\,f^b\,s^c\,l^d - c\right\}..8$$

$$\frac{dL}{dc} = 0 \Rightarrow c^{-\sigma}\,e^{-pt} = \lambda \qquad ....……………………………………… \;9$$

$$\frac{dL}{dk} = -\frac{d\lambda}{dt} \Rightarrow \;\lambda\left\{(1 - \tau)\,\frac{1}{\emptyset}\,ak^{a-1}\,f^b\,s^c\,l^d - c\right\}............................10$$

$$\frac{dL}{d\lambda} = \frac{dk}{dt} \Rightarrow (1 - \tau)k^a\,f^b\,s^c\,l^d - c \,..11$$

The solution for per capital growth rate of the economy along balanced growth path is given by

$$\frac{\acute{y}}{y} = \frac{1}{\sigma}\left\{(1 - \tau)\tau^{1-\frac{\alpha}{\alpha}}\alpha m_f^{b/\alpha}m_s^{c/\alpha}m_l^{d/\alpha} - \rho\right\}..12$$

The equation above shows that long run growth rate per capital output of the economy which is the measure of economic growth is a function of the tax rate and the shares of spending by different levels of government and exogenous factor. This forms the basis for the empirical examination of the relationship between fiscal decentralisation and economic growth and a country is more fiscally centralized if m_f has higher value as noted in the literature.

Given a share of total government spending in GDP and if the actual allocation diverges from the growth-maximizing expenditure share, some reallocation of public spending among three levels of governments will be growth-enhancing. This can be shown by maximising equation (9) while choosing m_f, m_s and m_l subject to the $m_f + m_s + m_l = 1$. The growth-maximising government budget shares are simply the following:

$$m_f^* = \frac{b}{b+c+d} \,..13$$

$$m_s^* = \frac{c}{b+c+d} \,..14$$

$$m_l^* = \frac{d}{b+c+d} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots15$$

It is therefore, clear that the growth-maximising spending shares are equal to the ratios of individual productivity over the aggregate productivity and as long as the existing government budget shares do not correspond to growth-maximizing shares, the growth rate and hence economic growth can always be increased without altering the total budget's share in GDP.

3.1. Model Specification

The simultaneous regression equation that will be estimated on Nigerian economy using annual data from 1970 to 2013 are pooled from statistical bulletin published by Central Bank of Nigeria and African Development Indicator is specified below:

$$g_t = \delta_0 + \delta_1 m_t + \delta_2 \tau_t + \delta_3' x_t + \varepsilon_{1t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots16$$

$$m_t = \beta_0 + \beta_1 g_t + \beta_2 P_t + \varepsilon_{2t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots17$$

where t is the number of time periods, α, δ_1, δ_2 are scalar parameters while δ_3' is a vector. g_t is the average growth rate, m_t is the measure of fiscal decentralisation and τ_t is the tax rate. x_t is a vector of control variables which are health expenditure, human capita and openess, P_t is the public burrowing theoretically, that there is positive relationship between degree of decentralisation and public borrowing rate of sub-nationals (Treisman, 2000) and ε_{1t} and ε_{2t} is the disturbance term that is assumed to be serially uncorrelated and orthogonal to the explanatory variables. The focus of this research are the coefficients δ_1 and β_1 which may be positive or negative and statistically significant given the conventional arguments in favour or against of average growth rate and fiscal decentralization policy respectively.

The consequences of ignoring the endogeneity problem discussed briefly in section 1 as this study has noticed in numerous studies is that the estimated result will be baised and inconsistent because error term of such equation is correlated with the explanatory variable of the equation. In other to overcome the econometric problems of endogeneity from equation 13 and 14 which are structural equation of the simultaneous equations model where g_t and m_t are the endogenous variables and x_t vector and P_t are strictly exogenous variables, the study estimate an over identified equation using the method of Two-Stage Least Square (TSLS).

3.2. Multivariate Cointegration Analysis and Error Correction Modeling

The cointegration analysis is fairly common and is well documented in the studies like Banerjee, et. al 1993; Hylleberg and Mizon 1989; Engle and Granger 1987; Johansen 1988; Johansen and Juselius 1990. Only summary is provided for here. According to Johansen (1988), multivariate cointegration model is based on the error correction representation given by:

$$\Delta Y_t = \mu + \sum_{i=1}^{\rho-1} \alpha_i \Delta Y_{t\text{-}i} + \beta Y_{t\text{-}1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (18)$$

Where Y_t is an (nx1) column vector of ρ variables, μ is an (nx1) vector of constant terms, **α** and **β** captured coefficient matrices, Δ is a difference operator, and $\varepsilon_t \sim$ IID(0, σ^2). The coefficient matrix **β** is known as the impact matrix, and it contains information about the long-run relationships. Johansen's methodology requires the estimation of the VAR equation (3) and the residuals are then used to compute two likelihood ratio (LR) test statistics that can be used in the determination of the unique cointegrating vectors of Y_t. The cointegrating rank can be tested with two statistics: the trace test and the maximal eigenvalue test.

4. Empirical Results and Concluding Remark

Analysis of the time series data employed in this study tend to exhibit either a determistic and/or stochastic time trend and are therefore non stationary at level; i.e., the variables in question have, means, variances and covariances that are not time invariant except expenditure on health and public burrowing. Direct application of OLS or GLS to non-stationary data produces regressions that are misspecified or spurious in nature (Engle and Granger, 1987). We therefore, subjected the variables for a unit root test using an Augmented Dickey-Fuller test (ADF) (Dickey-Fuller,1981) and Philip-Perron test (Philip-Perron, 1988). The results of this stationarity tests at level show that most of the variables are non stationary at level. We then difference the variables once in order to carry out stationarity tests on the differenced variables, the results of this confirmed stationarity as shown in the table 2 below:

Table 2. Result of the Unit Root Tests based on Augmented Dickey-Fuller Test

Series	Level	1st Difference	Order of Integration
Log g	-0.971543	-3.901088	I(1)
Log m (expenditure side)	-2.271678	-8.203590	I(1)
Log m (revenue side)	-3.497761	-8.846321	I(1)
Log T	-1.481866	-7.008466	I(1)
Log P	-4.600091		I(0)
Log hc	-1.902905	-4.391112	I(1)
Log opens	-3.054406	-7.334921	I(1)
Log health	-4.617369		I(0)

Note: All variables and symbols are defined earlier.

Source: Author computation (2014)

This shows that most of the variables involved are integration of order 1. The next step is to test for the existence of a cointegration relationship among the variables

using the Johansen Cointegration approach described above. The Johansen Cointegration test result indicates the existence of cointegration between variables employed. The maximum trace statistics reject the null hypothesis of no cointegration at 5 per cent level.

Table 3. Two Stage Least Square Estimation

Dependent Variable: Growth Rate of Per Capital GDP

Variables	OLS	OLS	IV	IV
C	-4.65415*	-5.0585*	-4.6542**	-5.05848*
D(log m) Expenditure side	-0.03407		-0.03407	
D(log m) Revenue side		-0.10378		-0.10378
D(Log t)	0.28017***	0.23512***	0.28017***	0.23518***
D(Log hc)	0.10330	0.15352	0.10330	0.15355
Log health	0.36374**	0.39505*	0.36374**	0.39505*
D(log opness)	-0.00548	0.00369	-0.00548	0.003685
No. of Observation	44	44	44	44
Adj R^2	0.39098	0.4065	0.39099	0.4788
D.W	1.6980	1.6265	1.6980	1.6265

*Note: *, ** represent 5%, 10% level of significance, *** represents both 5%, 10% level of significance*

Source: Author Computation (2014)

In term of statistical significance, fiscal decentralisation measure either at expenditure side or revenue side is statistically insignificant in all the regressions while other explanatory variables like for example tax rate and health which are statistically significant and positively correlated with economic growth.   This empirical result is supported by the study of Woller and Philips (1998) which failed to find any strong and systematic relationship between fiscal decentralisation and economic growth in the developing countries. Other literatures that arrived at this conclusion include Xie, Zou and Davoodi (1999), Nauumets (2003), Bodman and Ford (2006). This study therefore concludes that fiscal decentralisation is not instrumental to economic growth in Nigeria.

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