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## Efficiency Gain Argument of Fiscal Federalism and Economic growth: Evidence from Five Selected Developing Federal Economies.



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### Abstract

This paper investigated efficiency gain argument of fiscal federalism and economic growth with evidence from five selected developing federal economies. The curiosity is to ascertain whether the efficiency gain –the fundamental argument why countries adopt fiscal federalism is justified in these economies. The paper uses stochastic frontier model to achieve this objective. The evidence from the selected developing federal economies revealed diverging results. While in Nigeria, Ethiopia and India there is more expenditure decentralization than revenue decentralization suggesting that efficiency gains from fiscal federalism may remain elusive, in Brazil and South Africa there is more revenue decentralization than expenditure decentralization suggesting evidence of efficiency gains from fiscal federalism. The major reason why efficiency gains from fiscal federalism is elusive in Nigeria, Ethiopia and India is because of top – bottom approach to fiscal federalism orchestrated by the delay that money and services witness before reaching the local beneficiaries. Naturally, the gamma parameter ( $\delta_s^2$ ) that measures the percentage of the disturbance term due to inefficiency is expected to be low to

ensure allocative and technical efficiency of fiscal federalism. However, while the values of ( $\delta_s^2$ ) are 0.98, 0.92 and 0.65 in Nigeria, Ethiopia and India meaning that about 98%, 92% and 65% of the disturbance terms ( $\mu$ ) are due to allocative and economic inefficiencies in fiscal federalism, in Brazil and South Africa only 0.041 and 0.23 representing 4% and 23% disturbance terms are due to allocative and economic inefficiencies in fiscal federalism. This implies that while allocative and technical inefficiencies in fiscal federalism truncates economic growth in Nigeria, Ethiopia and India, the allocative and technical efficiencies in fiscal federalism promotes economic growth in Brazil and South Africa. On this basis, the paper recommends the need for most developing federal economies to adopt Bottom – Top approach to fiscal federalism as opposed to Top – Bottom approach. This will ensure that sub national governments are coordinates not subordinates to federal government revenues.

**Keywords:** Efficiency gain, Fiscal Federalism, Economic growth, Federal Economies

### INTRODUCTION

Fiscal federalism as a reform package for improving technical, allocative and overall economic efficiency in delivering public goods so as to stimulate economic growth has always been a focus of attention in most developing federal economies. This is because economic cum political considerations suggest that policies aimed at providing public goods that are sensitive to sub national conditions are likely to be more technical and allocative efficient in stimulating economic growth than central provisions that disregard this geographical differences (Baskran, Lars & Jan, 2016).

Consequently, fiscal federalism which defines the degree of fiscal autonomy and constitutionally assigned responsibilities of the sub national governments, has become an important discourse in the policy arena of most developing federal economies (Hatfield & Kosee, 2013). This is because the practice of centralized system of economic and political administration in the context of ethnic heterogeneity hinders the actualization of economic potential and in the process limits efforts aimed at achieving sustained economic growth (Asatryan & Feld, 2015).

Similarly, from 1980s to date, there has been a resurgence of interest in economic growth of most developing federal economies (Ibiih, Ajaude & Nkamare, 2016). An outstanding element in the policy mix given to the developing federal economies to

stimulate economic growth is the need to restructure the public sector finances so as to make it more efficient in promoting economic growth.

It has been observed that despite several decades of fiscal federalism experience, extant studies have established a downward trend in economic growth of most developing federal economies in the last three or four decades. (African Development Indicators, 2016). For instance, the two biggest economies in Sub Sahara African -Nigeria and South Africa entered into technical recession in 2016 as their Gross Domestic Products (GDP) declined by 3.16 and 0.70 percent respectively (World Bank Development Indicators, 2016). This has made researchers like Baskran, Lars and Jan (2016), Appah (2010), Alade (2003) to describe economic growth performance of most developing federal economies as of prolonged lackluster performance and of crisis proportion.

In spite of these dire situations with potential dangers for sustained economic growth, much have not been done to actually underscore how efficient is fiscal federalism in bringing about sustained economic growth in developing federal economies. Much of the extant studies on fiscal federalism in developing federal economies have been explicitly or implicitly disposed towards studying the theory and dimension of fiscal federalism (Dare, 2011, Lukpat, 2013) or explaining the pattern of intergovernmental fiscal relations (Jose, 2003, Jason, 2006, Igwebuike & Emengini, 2010) or providing an inexplicit view within the context of political economy of probable consequences of such relationship (Odukwe, 2016, Ugwu, Eme & Emeh, 2012). A notable exception in the extant studies is the work of Owolabi (2011), Ojide and Ogbodo (2014) and Baskran, Lars & Jan (2016) that investigated the impact of fiscal federalism on economic growth.

However, the fundamental argument (efficiency gain argument) why countries adopt fiscal federalism and how such measures influences economic growth is conspicuously missing in the existing studies. Further, the paucity of systematic comparative evidence as the focus of the established studies is mainly on specific country analysis makes it difficult to have a broader and generalized view of the evidence of efficiency gain in fiscal federalism. It is in a bid to fill this gap and add to the body of knowledge in the field of fiscal federalism, that, this paper investigates efficiency gain of fiscal federalism and economic growth: Evidence from selected developing federal economies. To achieve this objective, this paper is

structured into five sections as follows:- Section two reviews theoretical and empirical literature. Section three presents data sources, methodology and model specification. Section four discusses empirical results, while section five concludes the paper with conclusion and recommendations.

## 2.0 Literature Review

### 2.1 Theoretical Literature

Decentralization Theorem, constitutes the fundamental building blocks of what may be referred to as the first generation theory of fiscal decentralization (Oates, 2006; Bird, 2009). The theory focuses on situations where different levels of government provide efficient levels of outputs of public goods. That is those goods whose special patterns of benefits are encompassed by the geographical scope of their jurisdictions (Oates, 2006).

According to the theory, each levels of government is seen as seeking to maximize the social welfare of the citizens within its jurisdiction (Bird, 2009). This multi-levels quest becomes very important where public goods exists, the consumption of which is not national in character, but localized (Qates, 1972). In such circumstances, local outputs targeted at local demands by respective local jurisdictions clearly provide higher social welfare than central provision (Qates, 1972).

The theory also recognized that, given the multiplicity of local goods with varying geographical patterns of consumption, there was hardly any level of government that could produce a perfecting mapping for all public goods (Qates, 2006). This is because sub national governments are better in adapting output of public goods to a particular preferences and circumstances of their constituencies as compared to the federal government provisions that assumes that one size fits all. Thus, it is recognized that there would be local public goods with inter-jurisdictional spill-overs (Musgrave, 1959). That is public goods whose benefits are enjoyed beyond the local jurisdiction. In that situation, the local authority may then under-provide for such a good (Musgrave, 1997). To avoid this, the theory requires the central government to provide matching grants to the lower level government so that it can internalize the full benefits (Samuelson, 1954).

Based on the theory, the role of government in maximizing social welfare through public goods provision is assigned to the lower tiers of government (Qates, 2006). The other two roles of income distribution and stabilization are regarded as suitable for the central government. Based on the total agreement among the proponents of this theory, we can summarize the role assignment which flows from the theory thus: the central government is expected to ensure equitable distribution of income, maintain macroeconomic stability and provide public goods that are national in character. Sub national governments on the other hand are expected to concentrate on the provision of local public goods with the central government providing targeted transfers in cases where there are jurisdictional spill-overs associated with local public goods.

Following from the assignment of functions, taxes that matched more effectively the assigned functions are also assigned to the relevant level of government. Benefits taxes are also prescribed for sub national governments based on the conclusion that such taxes promote economic efficiency when dealing with economic units. The final element of this basic theory is the need for fiscal equalization. This is in the form of transfers from the central government to decentralized governments where there are spill-over effects.

## 2.2. Empirical Literature

Extant empirical literatures show a link between federalism, efficiency gain and economic performance. For instance, (Ogbonna & Osadume, 2017, Anit, 2014, Gemmell & Sanz, 2013, Baskaran & Feld, 2013, Rodriquez –Pose & Ezcurra, 2011, Eric, 2009) Wibbles, 2006), Abu, 2005, Rodden and Wibbles, 2001, Treisman, 2000, Bruecker, 1999, Anyanwu, 1999, Davoodi & Zou, 1998, Grossman and West, 1994, Egwaikhide, 1994, Ariyo, 1993, Oyejide, 1972), stress that increased fiscal federalism has negative effect on growth. To them collective action of problems and variance of interests that affect federalism jeopardize implementing macroeconomic policies and economic adjustment policies that are seen as public goods which have serious negative implication on growth.

On the contrary, studies by (Ibi, Ajaude & Nkamare, 2016, Ojide & Ogbodo, 2014, Federico & Elliott, 2012, Antonis, Manthos & Pantelis, 2008, Jason, 2006, Stansel, 2005, Iimi, 2005, Akai & Sakata, 2002, Lin & Liu, 2000, Yilmaz, 1999, Kletzer & Singh, 1996), found a

positive relationship between decentralization and economic growth. This is because to the authors, better targeting of growth-enhancing infrastructure investment under federalism could raise country's growth rate.

However, findings from extant studies like (Baskaran & Feld, 2013, Gemmell & Sanz, 2013) were mixed. This is because their findings revealed that spending measure of fiscal federalism decreases economic growth while revenue measure increases growth. This arises due to the choice of empirical measure adopted by different researchers. Although, the main objective of fiscal federalism is to ensure efficiency gain in public good delivery, however, this fact is not sufficiently recognized in the existing literature.

## 3.0 Data Sources, Methodology and Model Specification

### 3.1 Analytical Framework

The economic rationale for fiscal federalism is the need to promote efficiency in the use of a nation's resources. Thus the role of different tiers of governments in efficient delivery of public goods under the partnership arrangement called fiscal federalism is usually the focus of attention. Therefore, the analytical framework underpinning this study is the Barro (1990) two – sector production function framework. This production function assumes that an economy is made of two sectors called the public sector (G) and the Private sector (P) whose output depends on two inputs of Labour (L) and Capital (K). The production function takes the form of

$$Y = f(L, KP, KG) \text{-----} (1)$$

Where Y = Output, L = Labour, KP = Private capital per labour, KG = Public Capital per labour. The function also assumes that the public sector (G) has some influence on the output of the Private sector (P). Given this scenario, the sectoral production function becomes:

$$YP = f_P(LP, KP, G) \text{-----} (2)$$

$$YG = f_G(LG, KG) \text{-----} (3)$$

Combining equation (4.2) and (4.3) yields

$$Y = f_P(LP, KP, G) + f_G(LG, KG) \text{-----} (4)$$

It also assumed from equation (4.4) without generality loss that public sector (G) is made up of three tiers of government called the Federal, the State and the Local governments and by extension that public spending imbedded in the function is carried out by these three tiers of governments. Therefore, taking K as private capital stock, G as total government (F = federal government spending, S as state



government spending and L as local government spending), all measured on per capita basis, the production function becomes

$$Y = \beta_1 + L_\mu + K_\theta + G_\gamma + \epsilon_t \quad \text{-----(5)}$$

Where Y = Economic growth, L = Labour, K = Private capital stock, G = (federal, state and local Governments),  $\epsilon_t$  = Error term and  $\beta$ ,  $\mu$ ,  $\theta$  and  $\gamma$  are parameter estimates, where  $1 > \beta > 0$ ,  $1 > \mu > 0$ ,  $1 > \theta > 0$ ,  $1 > \gamma > 0$  and  $\beta + \mu + \theta + \gamma = 1$ . -----(6)

Flowing from equation (4.5), the study assumes that the size of government (G) impacts on economic growth and that fiscal federalism that reduces the size of central government promote efficiency by matching preference to needs. Therefore, theoretically, it is anticipated that fiscal federalism fosters economic growth via technical, allocative and economic efficiency in public goods delivery. However, empirical evidence on the direction of impact is mixed and controversial. A strand of extant literature showed that increased fiscal federalism reduces economic growth (Baskaran & Feld, 2013, Rodriques –Pose & Ezcura, 2011.). Other strand of empirical studies revealed a positive impact (Sansel, 2005, Gil – Serrate & Lopez – Laborda, 2006, Ibi, Ajaude & Nkamare, 2016). In addition, some existing studies revealed mixed results (Gemmell & Sanz, 2013, Bodman, 2011). This showed that the impact of fiscal federalism on economic growth is an empirical issue. Also, intergovernmental fiscal relations or fiscal federalism is expected to influence the output of government (G). Therefore, introducing fiscal federalism (FDC) as an explanatory variable in the model gives

$$YG = f(\text{FDC}) \quad \text{-----(7)}$$

Therefore incorporating the three measure of fiscal federalism in equation (7) into equation (5) gives

$$Y = f(L_\mu + K_\theta + \phi g_1 + \varphi g_2 + \mu g_3) + \epsilon_t \quad \text{-----(8)}$$

Where  $\phi g_1$  = the proportion of sub national governments revenue to total government revenue (Revenue measure (FDC1),

$\varphi g_2$  = the proportion of sub national governments revenue to total government spending (Simultaneity measure (FDC3).

$$\text{Where } \phi g_1 + \varphi g_2 + \mu g_3 = 1 \quad \text{-----(9)}$$

and  $0 < \phi < \varphi < \mu$  for  $i = g_1, g_2$  and  $g_3$ .

However, total government spending (g) is financed through government revenue (R). So that,

$$G = RY \quad \text{-----(10)}$$

Combining equations (4.9) and (4.10), the solution for efficiency gain from fiscal federalism can be stated thus:

$$\frac{\partial y / \partial t}{\partial y} = \frac{1}{\sigma} \left[ (1 - R) R^{1-\alpha/\alpha} \cdot \theta g_1^{\beta/\alpha} \cdot \varphi g_2^{\gamma/\alpha} \cdot \mu g_3^{\omega/\alpha} - P \right]$$

$$\text{-----(11)}$$

Equation (4.11) is a function of share of revenue and spending by the sub national governments. However, the existing studies like (Baskaran, Lars & Jan, 2016) have it that given the share of total government spending in Gross Domestic Product (GDP), a reallocation of public spending to sub national governments can bring about higher economic growth if the existing allocation is not a growth – maximizing expenditure share. To underscore this, by maximizing equation (4.9) subject to equation (4.10) as constrain gives the growth – maximizing sub national government spending share thus:

$$\theta_{g1}^* = \frac{\beta}{\beta + \gamma + \omega}, \quad \varphi_{g2}^* = \frac{\gamma}{\beta + \gamma + \omega}, \quad \mu_{g3}^* = \frac{\omega}{\beta + \gamma + \omega} \quad \text{-----(12)}$$

In equation (4.12), the numerator is the share of the sub national governments' spending and the denominator is the consolidated or total (federal, state and local governments) spending. Hence as far as the sub national governments' shares are different from growth – maximizing share, the growth rate will always increase without changing the total budget's share in Gross Domestic Product (GDP).

### 3.2. Model Specification

The study adopted stochastic frontier model developed by Farrell (1957). This was found appropriate for two reasons:- first, the model assumed that the disturbance term has two components called the statistical noise or error term and the inefficiency component. Therefore, the greater the amount by which the realized economic growth (Y) falls short of this stochastic frontier, the greater the level of inefficiency gains from fiscal federalism. Secondly, the model captures the effect of exogenous shock due to measurement error. That is to say, the model accounts for unbiased identification in the midst of confounding variables. An appropriate stochastic frontier formulation is:

$$Y_t = \alpha_0 + \beta_{X1} + (V_i - \mu_i) \quad \text{-----(13)}$$

Where Y = Economic growth (GDP),  $X_i$  = Input,  $V_i$  = random variables assumed to be normally distributed,  $\mu_i$  = random variables that account for the inefficiency. Given this scenario, the reformulated stochastic frontier model for this study becomes:-

$$\ln Y_t = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + (v_i - \mu_i) \quad \text{-----(14)}$$

Where  $\ln$  = Natural Logarithm,  $Y_t$  = Economic growth proxied by RGDP,  $X_1$  = Labour input,  $X_2$ ,  $X_3$  and  $X_4$  = Three measures of fiscal federalism (FDC1, FDC2 and FDC3),  $\beta_0$  = Constant,  $\beta_1$ ,  $\beta_2$  and  $\beta_3$  = Parameters to

be estimated,  $v_i$  = random variable assumed to independently and normally distributed with zero mean and constant variance  $N[\mu_v^2, \sigma_v^2]$  ----- (15)

$\mu_i$  = Non- negative random variable that accounts for inefficiency in economic growth – fiscal federalism nexus. It is also assumed to be normally distributed with  $N[\mu_\sigma^2, \sigma_\sigma^2]$  ----- (16)

It is expected that the gamma parameter ( $\delta_s^2$ ) that measures the percentage of disturbance term due to inefficiency be low to ensure allocative and technical efficiencies of fiscal federalism that will promote economic growth.

### 3.3 Data sources and definitions of Variables

This section presents the selected federal countries for the study and the rationale for their selection, the data set used and the definition of the variables on which the data are sourced. The selection of five (5) countries is based on the fact that their institutional frame work of their fiscal federalism followed a complex political, social, economic and ethnic pluralism and that they are among the most fiscally decentralized countries as measured by the degree of government expenditures at the sub national levels. The study examined the period from 1980 to

2016. The variables used in this study include revenue measure (FDC1) defined as sub national governments 'own revenue as a ratio of total government revenue. This reflects the decentralization of taxing power. Expenditure measure (FDC2) defined as sub national governments' spending as a ratio of total government expenditure. It reflects the decentralization of the spending power and Simultaneity measure (FDC3) defined as Sub national expenditure as a ratio of total federal revenue. Data for these variables are sourced from the apex bank statistical bulletins of the respective countries. Other variables include, Real Gross Domestic Product (RGDP), sourced from World Bank development indicators.

### 4.0 Discussion of Empirical Results

This section of the paper presents results of the estimation using stochastic frontier model for the selected economies of Nigeria, Brazil, India, Ethiopia and South Africa. However, it is important to first of all present the summary statistics of the variables used in the estimation to both ascertain their behavior and underscore the appropriateness of technique employed in the paper. The result of the summary statistics is presented on table 1 below.

**Table 1 Summary Statistics of the Variables used in the Model**

	BRAZIL			INDIA			ETHIOPIA			SOUTH AFRICA			NIGERIA		
	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3	FDC1	FDC2	FDC3
Mean	99.83	38.15	97076.93	19.44	27.21	15.36	22.42	47.98	25.79	24.15	44.20	11.58	23.030	35.77	30.96
Median	99.81	33.58	33481.01	18.79	25.86	14.65	16.54	49.58	13.63	27.61	31.05	2.79	24.31	41.55	26.89
Maximum	99.99	83.33	836284.2	27.76	34.30	22.66	64.72	76.10	162.17	91.39	99.56	43.70	34.84	53.50	46.86
Minimum	99.55	26.08	13738.25	14.89	22.37	11.10	11.40	20.79	9.01	0.54	2.23	0.01	13.15	15.05	15.15
Std. Dev.	0.14	13.88	193262.5	3.17	3.21	2.98	14.96	15.52	39.20	24.01	33.98	13.94	5.63	11.04	10.06
Skewness	0.12	2.58	3.12	0.81	0.69	0.90	2.20	0.22	3.01	1.36	0.73	0.89	0.16	0.29	0.11
Kurtosis	1.50	8.912	11.40	3.28	2.33	3.24	6.34	1.93	10.44	4.88	2.04	2.38	2.02	1.65	1.43
Jarque-Bera	2.60	69.46	123.29	3.07	2.70	3.74	34.31	1.51	102.94	12.28	3.39	4.06	1.53	3.14	3.66
Probability	0.27	0.00	0.00	0.22	0.26	0.15	0.00	0.47	0.00	0.02	0.18	0.13	0.46	0.21	0.16
Sum	2695	1029.94	2621077.	524.81	734.75	414.60	605.35	1295.35	696.47	652.12	1193.36	312.85	806.06	1251.88	1083.60
Sum Sq. Dev.	0.54	5009.81	9.71	261.25	267.98	231.13	5823.08	6259.66	39955.82	14989.75	30012.60	5047.83	1077.32	4143.93	3440.21
Observations	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27

Source: Authors' computation based on the data of each selected countries

From table 1, the mean values of all the measures of fiscal federalism, the proportion of sub national governments revenue to total government revenue (FDC1), the proportion of sub national governments' spending to total government spending (FDC2) and the proportion of sub national governments revenue to total government spending (FDC3) are positive. It is worth noting that out of the three measures of fiscal federalism, (FDC1) and (FDC3) account more for fiscal autonomy of the sub national governments than (FDC2). This is because; it is not possible to have fiscal autonomy without fiscal equivalence. To this end while FDC1 is having the highest value in Brazil, FDC2 is having the highest value in Nigeria, South Africa, India and Ethiopia. This implies that while there is revenue

decentralization in Brazil, there are revenue centralization in Nigeria, South Africa, India and Ethiopia.

Also, the minimum and maximum values range from positive to positive in all cases for all the variables. The implication is that all the variables are increasing overtime. However, FDC1 overtime increases more than FDC2 in Brazil while FDC2 over time increasing more than FDC1 in other four selected economies. This implies that while the sub national governments revenue rises more than their expenditure in Brazil, in other four selected economies, the sub national governments expenditure rises more than their revenue. The skewness which measures the

asymmetry of the distribution of the series around the mean are positive. Although, the skewness of the normal distribution is zero, all the variables are positively skewed and greater than zero.

Jaque-Bera statistics showed that the null hypothesis that all variables are normally distributed cannot be accepted as all the variables are statistically insignificant at 5%. Therefore all the variables used in the study are not normally distributed. This implies that Ordinary Least Square estimator becomes inappropriate, thereby justifying our choice of stochastic frontier model.

**Table2: Comparative Empirical Evidence of Efficiency Gains from Fiscal Federalism in Brazil, Nigeria, Ethiopia, India and South Africa.**

dependent var. (GDP)	(1)	(2)	(3)	(4)	(5)
Independent var	Nigeria	Ethiopia	South Africa	India	Brazil
Labour	15,027**	11,213*	10,761**	17,247**	9,671*
	(8,532)	(5,321)	(4,782)	(9,732)	(3,890)
fdc1	-13,073*	-3,498***	0.034***	0.030	-0.53
	(6,784)	(908)	(0.0057)	(0.040)	(0.33)
fdc2	1,147	2,573***	0.00024	0.14***	-0.0021
	(4,477)	(425)	(0.0038)	(0.016)	(0.0032)
fdc3	6,183	1,269	-0.014	-0.011	9.207***
	(4,118)	(375)	(0.0090)	(0.041)	(2.3-07)
Constant	350,340**	-11,651	12.7***	10.9***	67.3**
	(169,638)	(40,897)	(0.52)	(0.66)	(33.3)
$\delta\mu$	0.64	0.64	0.007	0.68	0.003
$\delta_s^2$	0.98	0.96	0.23	0.65	0.041
$X^2$	6.6	44	66.7	106	17
L.R	-471	-309	-18.5	-915	4.8
T R	-1.03	-1.07	6.4	-1.01	14.7
Observations	27	27	27	27	27

Source: Author's computation based on the results, where  $\delta\mu$  = inefficiency component,  $\delta_s^2$  = gamma parameter,  $X^2$  = chi square, LR = Likelihood Ratio, TR = Time Ratio and Standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The results of Table 2 on the efficiency gains from fiscal federalism provide not only an interesting insight on how fiscal federalism is practiced in developing federal economies but revealed widely deviating results. As stated in the summary statistics, of all the three measures of fiscal federalism, Revenue measure (that is the proportion of sub national governments revenue to total government revenue (FDC1) and Simultaneity measure (that is the proportion of sub national governments revenue to total government spending (FDC3) account more for fiscal autonomy of the sub national governments and consequently on efficiency gain than the Expenditure measure that measures the proportion of sub national governments' spending to total government spending. This is because fiscal autonomy is not achievable without fiscal equivalence. However, the evidence from the

selected developing federal economies revealed diverging results. This is so as the gamma parameters ( $\delta_s^2$ ) that measure the percentage of the disturbance term due to inefficiency is 0.98, 0.92 and 0.65 in Nigeria, Ethiopia and India respectively meaning that about 98%, 92% and 65% of the disturbance terms ( $\mu$ ) are due to allocative and economic inefficiencies in fiscal federalism in these economies. Also, the examination of the likelihood ratio test result using chi square ( $X^2$ ) distribution confirmed the presence of allocative inefficiencies. Furthermore, the linear trend coefficients are negative and insignificant at conventional 5% level. The implication of these findings is that in Nigeria, Ethiopia and India efficiency gains from fiscal federalism remains elusive. The major reason why efficiency gains from fiscal federalism is elusive in Nigeria, Ethiopia and India is because of vertical fiscal imbalance resulting from top – bottom

approach to fiscal federalism orchestrated by the delay in the time that money and services take to reach the local beneficiaries.

Naturally, efficiency gain is guaranteed if most of the public goods and services are produced and delivered at the level closer to the beneficiaries. However, this is only achievable where there is sub national governments' fiscal equivalence.

On the other hand, in Brazil and South Africa only 0.041 and 0.23 representing 4% and 23% disturbance terms are due to allocative and economic inefficiencies in fiscal federalism. Also, the results of the likelihood ratio test results using chi square ( $X^2$ ) distribution confirmed the presence of allocative efficiencies in these economies. Also, the linear trend coefficients are positive and significant at conventional 5% levels. The implication of this finding is that there is evidence of efficiency gains from fiscal federalism in Brazil and South Africa.

To underscore this, while in India, the two revenue measures (FDC1 and FDC3) are insignificant at 1%, 5% and 10% respectively. In Nigeria and Ethiopia the case is even worse in Nigeria and Ethiopia as FDC3 is insignificant with FDC1 appearing negative and significant. This is surprising in the light of the conventional expectation that sub national governments' revenue to total government revenue is usually associated with positive economic growth that culminates into high efficiency gains. The result suggests that fiscal federalism in Nigeria, India and Ethiopia does not yield a clear pattern of fiscal decentralization on the revenue side. The implication of this, is that the principle of fiscal equivalence is highly compromised thereby preventing the sub national governments from efficiently delivering on their constitutionally assigned responsibilities that will bring about technical, allocative and economic efficiency.

This findings, suggest that the dominance of the federal government in these three federal economies contradicts the fiscal federalism theorem that local outputs targeted at local demands by respective local jurisdictions clearly provide higher social welfare and efficiency than central provision that believe in one cap fit all syndrome.

On the other hand, in Brazil and South Africa, the revenue measures are highly significant at 1%. This is so because, in Brazil the sub national governments control one of the major revenue yielding items in constitution (Value Added Tax (VAT) while in South Africa fiscal imbalance at the sub national levels are bridged by the transfer equivalent that accounts for the bulk of the sub national governments' revenue.

Therefore, the fiscal federalism experience of Brazil and South Africa validates the mainstream theoretical insight behind fiscal federalism that sub national governments allocate resources better than the central government which usually results in technical, allocative and economic efficiency. Finally the general implication of this result is that although theoretical justifications for fiscal federalism may be the same, its practicability and associated efficiency gain differ in federal systems based on institutional framework.

## 5.0 Conclusion and Recommendations

From the findings, it can be concluded that lack of fiscal equivalence orchestrated allocative and technical inefficiencies of fiscal federalism is the major cause of truncated economic growth in some of the selected federal economies. On that note, this paper recommends the need for most developing federal economies to adopt Bottom – Top approach to fiscal federalism as opposed to Top – Bottom approach. This will ensure that sub national governments are coordinates not subordinates to federal government revenues. It is also recommended that there is need to chart a new direction in fiscal development among the developing fiscal countries by encouraging front loading (more revenue drive) as against back loading (expenditure drive).



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