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Government Size and Economic Growth in Nigeria: An Assessment

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Abstract

As the size of the federal government expands in tandem with debt, economic growth rather looks gloomy despite the country's emergence from two recessions in four years. Although the situation provokes studies with robust outcomes, however, there is no convergence in findings. As such, in the attempt to contribute to the empirics, this paper assesses the relationship between government size and economic growth using the Johansen co-integration technique on time series data covering the period 1981-2020. A long-run relationship is affirmed as expenditure on transfers Granger-causes economic growth while economic growth Granger-causes social and community services, and a no-causality is established between economic growth and every other component of expenditure. Nonetheless, expenditure on social and community services impact economic growth negatively even as economic services and transfers promote growth. Thus, with disaggregated recurrent expenditure, government size exhibits both positive and negative relationships with economic growth in Nigeria. In effect, more budgetary allocation is suggested for economic services.

Keywords
Causality, Co-Integration, Economic Growth, Government Size, Recurrent Expenditure

1. INTRODUCTION

The size of the Nigerian government vis-à-vis economic growth and development is drawing concerns. The concerns stem from the behaviour of macroeconomic indicators in which, among others, headline inflation rises from 7.8% in 2013 to 11.37% in 2019 and 15.75% in 2020 as food inflation reaches 39.5% between 1996 and 2021. Although government spends to develop the economy, however, in the past three years, despite reaching around 13% of gross domestic product (GDP), public spending is predicated on debt and average deficit of about 29.4 and 4.9% of GDP, respectively (Heritage Foundation, 2021). Moreover, being the cause of the deficit, government spending ought to stimulate demand and boost output through job creation (Amadeo, 2019). Incidentally, a key indicator reflecting the effect of government spending as necessitated by deficit is unemployment. Unemployment rate, however, rises from 14.2% in 2016 to 23.1% and 27.1% in 2018 and 2020, respectively (National Bureau of Statistics [NBS], 2021). Nonetheless, while tax serves as a source of income, the overall revenue performance of 2018 budget stands at only 53% with 67% expenditure performance (Udoma, 2019) as overheads eat around 70% of total revenue. Also, despite the expenditure performance, the recurrent aspect increases steadily over the years even as the rate of economic growth fluctuates between -13.1 and 15.3% in 1986 and 2002, respectively. As it stands, however, while recurrent expenditure climbs from NGN7.5 billion in 1985 to NGN1,110.6 billion in 2004 and NGN8,121 billion in 2020, growth rather trends respectively from 5.9% to 9.2% and 1.9% (Central Bank of Nigeria [CBN], 2020; World Bank, 2021), thereby raising question on the relationship between government size and economic growth in the country.

Meanwhile, as a multi-ethnic and culturally diverse entity, Nigeria operates a federal system of government with a bi-cameral legislative structure consisting 469 national assembly (NASS) members. The NASS is made up of 360 members in the house of representatives and 109 senators, both of which are elected across 36 states and a federal capital territory (FCT) with 774 local councils. In the country's national account, total recurrent expenditure is decomposed into four main headings: administration, social and community services, economic services, and transfers.

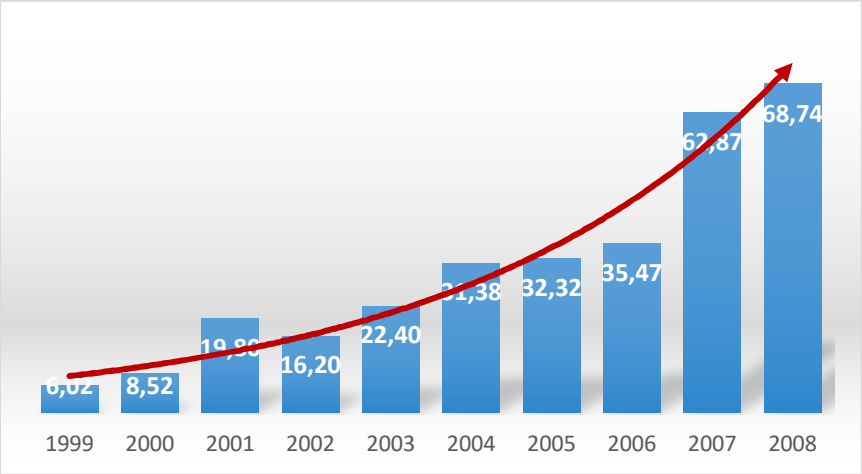

Figure 1: Trend of Expenditure On National Assembly In NGN'billion, 1999-2008.

Source: Author's representation with data from CBN (2020).

Incidentally over the years, total recurrent expenditure increases substantially from NGN4.85 billion in 1981 to NGN8,121 billion in 2020 as against mild rise in total capital expenditure from NGN6.57 billion to NGN1,614 billion and nominal output/GDP from NGN144.83 billion to NGN144,210.49 billion, respectively in the same periods (CBN, 2020).

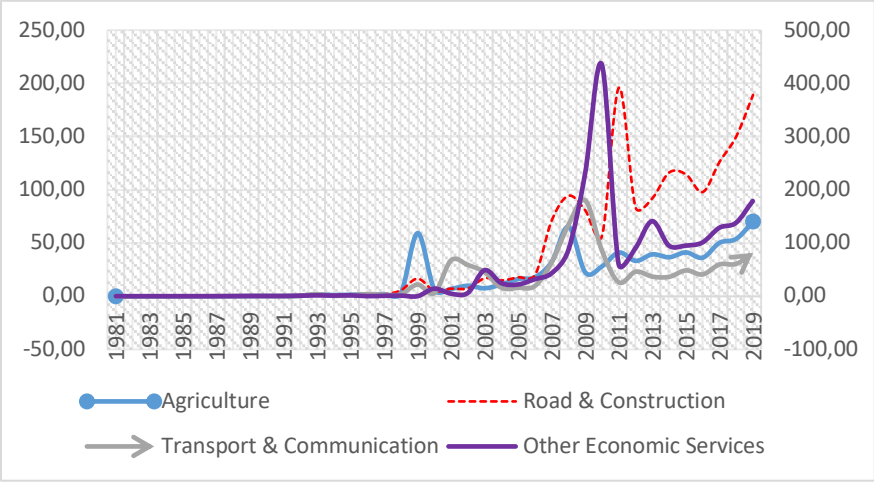

Figure 2: Trends of Expenditure on Economic Services, 1981-2019.

Source: Author's representation with data from CBN (2020).

Moreover, the World Bank (2021) publication shows that annual rate of growth of the economy fluctuates between -13.1% in 1981 and 2.2% in 2019. Meanwhile, as the main headings of the recurrent expenditure are further split into different cost centres, the administration and

transfers headings constitute the larger parts of the size of government. For example, being the least in cost, economic services reach NGN479.03 billion in 2019 followed by the social and community services with NGN1,393.56 billion, and administration and transfers with NGN2,105.20 billion and NGN3,019.61 billion, respectively. Even then, as economic services bear the least cost, the amount that goes into road & construction is not comparable to what is spent by the NASS between 2004 and 2008 as embedded in Figures 1 and 2. In a similar analysis, Figure 3 depicts trends in the components of social and community services in the country.

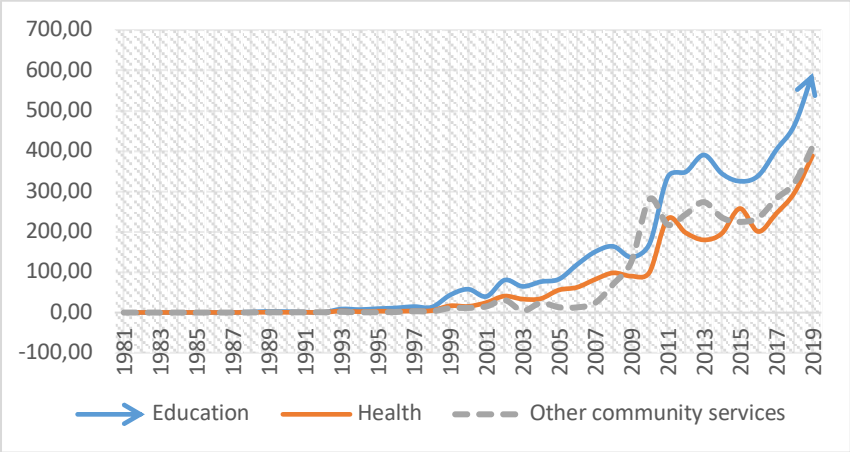

Figure 3: Trends of Expenditure on Social And Community Services, 1981-2019.

Source: Author's representation with data from CBN (2020).

Basically, a government is bound to produce certain economic goods which the private sector would not be willing to undertake for the reason of profit. And aside growth in the traditional functions of allocation and distribution, government activities are also expanding as regard subsidy payments and welfare programmes. Thus, while successive governments increase spending, discussion is provoked regarding government size and the Nigerian economy. The discussion, however, splits into studies whose findings are rather conflicting than convergent. For instance, while Nurudeen and Usman (2010) find an inconsistent relationship between growth and the size of government, Olawole, Adebayo and Idowu (2018) rather report a negative relationship. Although it is not out of place to arrive at divergent opinions on the relationships between growth and government size, however, such opinions should align with any of growth causing government size (Samudram, Nair & Vaithiligam, 2009), government size causing growth (Loizides & Vamvoukas, 2005), a feedback causality (Abu-Eideh, 2015), negative relationship (Fall & Fournier, 2015), positive relationship (Myles, 2009; Teles & Mussolini, 2014), and no relationship (Agell, Lindh & Ohlsson, 1995). More importantly, as an economy grows, there is the need for government activities in order to ensure and sustain operational efficiency. In effect, government can utilize its size, through spending ability, to stimulate aggregate demand necessary for job creation and long-run growth. Although government can increase in size, its existence should, however, facilitate efficiency in the private sector rather than replacing it. The idea is that a too large government might be detrimental to growth if the cost of financing public spending is such that crowds-out private firms through business stifling taxes and interest rates. Similarly, a large government might drag growth when public investment and production are relatively less productive than that of the private sector. Even then, growth can also be stifled if the size of government is too small to

the extent that basic infrastructural facilities are not provided. As such, a balancing approach to the use of government size might be more appropriate (Fournier & Johansson, 2016; Johansson, 2016; Africa Economic Outlook [AEO], 2021). It is on this premise this paper assesses the relationships between government size and economic growth in Nigeria.

The rest of the paper is sectioned into four as section two reviews the literature, section three provides the methodology while section four presents and discusses the empirical results. Section five concludes with recommendations.

2. LITERATURE REVIEW

Baring consensus in the definition and measure of government size, the review of literature follows existing theories and empirical opinions on the subject matter in relation to economic growth and other macroeconomic variables. Thus, after the theoretical underpinning, the empirical review concentrates on country-based studies as follows.

2.1 Theoretical Underpinning and Framework

The framework rests on two theories of government size and growth: the citizen-over-state and state-over-citizen (Garrett & Rhine, 2006). As such, on the premise that the size of government grows due to increase in demand for public programme, the citizen-over-state theory opines on the evidence that demand can emanate either from individual citizens or collection of citizens. The discussion thus follows three approaches: the first is government as a provider of goods and a reducer of externalities; the second sees government as a redistributor of income and wealth; and the third is the interest groups. As a benevolent provider of goods and reducer of externalities, the government in this approach responds to the median voter who determines the public good to demand as a function of taste, income, and the relative prices of public and private goods. Thus, whether, or not, government grows or contracts, is determined by both the price of government good and the price elasticity of demand for government good. That is, government spending increases if the price of government goods and services increases more than proportionate decrease in the quantity demanded of the goods and services. However, in the case of government being redistributor of income and wealth, every programme of the government is perceived to be a redistributive mechanism. In this light, the theory models a situation in which government collects, through tax, more from high income group in order to redistribute income evenly by providing public goods and services to the society, especially to the low-income group. But then, the interest groups theory states that government size can increase by the organized activities of interest groups of voters or businesses than individual citizens. In effect, using focused lobbying, the group can win policy that has direct benefit for its members but whose cost is spread across taxpayers. As regard state-over-citizen theory, the approach sees government size as supply driven in the absence of effective citizen demand on the basis of bureaucracy theory and monopoly leviathan government. Specifically, the bureaucracy theory describes the situation in which government output results not only from citizen demand but also from the preferences and demands of government bureaucrats who can present greater budget in excess of what the citizens demand. The monopoly government represents an ideology in which the political party controlling the legislature practices the objectives of reelection, personal ideals and pecuniary gains. Such that, in the provision of public goods and services, the government achieves its objectives by bundling issues that are beneficial to its members along with public goods and services being provided. In essence, however, while facing constitutional constraints, the sole objective of a leviathan monopoly government is revenue maximization (Brennan & Buchanan, 1980).

2.2 Empirics

There are scanty empirical discussions on the subject matter. Even then, among the available few, the relevant ones are contradicting in findings. For instance, while acknowledging opposing opinions on the relationship between government size and economic growth, Salih (2012) uses the cointegration, causality, and ECM techniques to test Wagner's hypothesis for Sudan over the period from 1970 to 2010. The data-set employed affirms Wagner's hypothesis for the country. Also, in an attempt to validate Wagner's law in Nigeria, Dogo et al (2013) adopt the fully modified ordinary least squares (FMOLS) technique to analyse quarterly data over the period 1982-2012. Aside the support for Wagner's hypothesis, the study further affirms the existence of a long-run association between government expenditure and economic activity in the country. Thus, while corroborating Goffman's version of Wagner's law, the study suggests the creation of fiscal space for increasing revenue. However, Awomuse, Olorunleke and Alimi (2013) use the Toda-Yamamoto technique to confirm whether, or not, there is statistical causality between government expenditure and growth in per capita real GDP in Nigeria during the period 1961-2011. While it reveals that long-run relationship does not exist between the variables, the causality test also affirms that Wagner's law does not hold over the period considered.

Moreover, the validity of the postulations of Barro (1990) on nonlinear relationship between government size and economic growth is tested by Alimi (2014) for the period 1970-2012 in Nigeria. The study affirms the existence of a U-shaped curve and optimal government size for the country. But while gauging the correlation between government size and developments in consumer price index (CPI) during the period 1981-2013 in Nigeria, BigBen (2014) establishes the existence of long-run relationship between the variables. However, as a component of government size, government expenditure does not have causal relationship with CPI in the short and long run, thereby implying that government size does not cause inflation in Nigeria. In addition, Olawole, Adebayo and Idowu (2018) examine the link among openness, government size and economic growth in Nigeria over the period 1986-2015. Findings reveal that government size impacts negatively on growth in both short and long runs. In effect, the study concludes that the desired benefits have not been yielded despite increase in government size in the country.

Meanwhile, using the highlights of theoretical and empirical evidences, Nyasha and Odhiambo (2019) survey the causal relationship between government size and economic growth in developed and developing countries. The study establishes four outcomes regarding the causality between the variables in which the prominent appears to be unidirectional causality running from economic growth to government size while the next being bidirectional causality between the variables. Nonetheless, Nwosa and Akinbobola (2020) examine the compensation hypothesis by analysing the relationship between globalization and government size in Nigeria during the period 1981-2018. As measure of government size, government expenditure is disaggregated into economic services, social and community services, and transfers, the study concludes that compensation hypothesis does not hold in Nigeria if data for government expenditure are aggregated.

3. METHODOLOGY

The process for assessing the relationships between government size and economic growth adopts the OLS technique. Thus, GDP at 2010 constant US dollar is proxy for economic growth, the dependent variable. The independent variable is government size which can be measured by indexes which include government expenditure as percentage of GDP, average tax rate or tax as percentage of GDP, the number of government administrative agencies, and ratio of civil

servants to total employment (Chen, 2020). However, for the reasons of non-availability of data and the fact that government spending on social resources is mostly reflected in the proportion of expenditure in GDP, this study measures government size by government recurrent expenditure-GDP ratio which is decomposed into administration-GDP ratio, social and community services-GDP ratio, economic services-GDP ratio, and transfers-GDP ratio, as well as real general government final consumption expenditure-GDP ratio. Moreover, due to the nominal nature of all the data, the variables are necessarily transformed to natural logarithms in order to obtain uniform scale of measurement and ease the interpretation of estimation coefficients. Also, in order to capture the movement of growth and expenditure pattern of the government after the oil boom and before the advent of corona virus disease, the paper covers the period 1981-2020. Nonetheless, aside the data for real general government final consumption expenditure which are gathered from World Bank (2021), all data are collated from CBN (2020).

Essentially, there are inherent tendencies for the activities of government to increase both intensively and extensively. Such that, there is a functional relationship between the growth of an economy and the growth of the government activities. However, following the Keynesian advocacy that, for aggregate demand to increase, government spending must increase to the level that private-spending is offset and tax raise is avoided. Thus, in line with state-over-citizen theory, as well as Barro (2015), and empirical works of Herath (2012) and Olawole, Adebayo and Idowu (2018), the basic relationship between government size and economic growth is functionally expressed as,

$$Y_t = f(Gvz_t) \tag{1}$$

where, at time *t, Y* is economic growth and, *Gvz* is government size.

But then, since the independent variable is decomposed, therefore, following Barro (2015), expression (1) modifies to,

$$Y_t = f(LAdm_t, LScs_t, LEcs_t, LTrf_t, LGfc_t) \tag{2}$$

where, *L* is logarithm, *Adm* is administrative expenditure-GDP ratio, *Scs* is social and community services-GDP ratio, *Ecs* is economic services-GDP ratio, *Trn* is transfers-GDP ratio, and *Gfc* is general government final consumption expenditure-GDP ratio. The linear transformation becomes,

$$lY_t = \beta_0 + \beta_1 lAdm_t + \beta_2 lScs_t + \beta_3 lEcs_t + \beta_4 lTrn_t + \beta_5 lGfc_t + u_t \tag{3}$$

where, β_0 is constant, while $\beta_{1,\ldots,5}$ are parameters to be estimated and u is error term.

3.1 Pre-estimation Tests

Very imperative is the need for pre-estimation tests to ascertain the behaviour of the data series, as well as whether, or not, long-run relationship exists between or among variables of interest. Such tests include the unit root, causality, and co-integration tests as presented one-after-the-other as follows.

3.1.1 The Unit Root Tests

Several studies are of the opinion that majority of time series data are non-stationary because of unit root (Nelson & Polsser, 1982; Stock & Watson, 1988; Campbell & Perron, 1991). Such that, a spurious regression is obtained when non-stationary time series are employed. Thus, Perron (1989) affirms the use of tests to establish the existence of unit root if a time series exhibits stationary fluctuations around a trend. In this regard, the Augmented Dickey-Fuller (ADF) of Dickey and Fuller (1979), Phillips-Perron (PP) of Phillips and Perron (1988), and the technique

of Kwiatkowski, Phillips, Schmidt and Shin (KPSS) (1992) are adopted to test for unit root as follows.

Considering a simple AR(1) process of the form,

$$y_t = \rho y_{t-1} + x_t'\delta + \epsilon_t \quad (4)$$

Upon subtracting y_{t-1} from both sides of equation (4), the ADF test is conducted by estimating,

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \epsilon_t \quad (5)$$

where, $\alpha = \rho - 1$. The null and alternative hypotheses may be written as,

$$H_0 : \alpha = 0 \qquad H_1 : \alpha < 0 \quad (6)$$

However, if the series is correlated at higher order lags, the assumption of white noise disturbances is violated. Thus, it is assumed that y series is an AR(p) process of the test regression,

$$\Delta y_t = \alpha y_{t-1} + x_t'\delta + \beta_1 \Delta y_{t-1} + \beta_2 \Delta y_{t-2} + \ldots + \beta_p \Delta y_{t-p} + \upsilon_t \quad (7)$$

which is then used to test equation (6) using the t-ratio, $t_\alpha = \alpha/\big(se(\hat{\alpha})\big)$, where $\hat{\alpha}$ is the estimate of α, and $se(\hat{\alpha})$ is the coefficient standard error (Dickey & Fuller, 1979).

The PP test, on the other hand, is based on the statistic,

$$t_\alpha = t_\alpha \left(\frac{\gamma_0}{f_0}\right)^{1/2} - \frac{T(f_0 - \gamma_0)\big(se(\hat{\alpha})\big)}{2 f_0^{1/2} S} \quad (8)$$

where, s is the standard error of the test regression, γ_0 is a constant estimate of the error variance in equation (4), and f_0 is an estimator of the residual at frequency zero (Phillips & Perron, 1988).

Meanwhile, the KPSS test is different from the ADF and PP unit root tests in that the series y_t is assumed to be (trend-) stationary under the null. As such, based on the residuals from the OLS regression of y_t, the statistic is,

$$y_t = x_t'\delta + u_t \quad (9)$$

and the Lagrange Multiplier (LM) is defined as,

$$\text{LM} = \sum_t s(t)^2/(T^2 f_0) \quad (10)$$

where, s(t) is a cumulative residual function of the form, s(t) = $\sum_{r=1}^{t} u_r$ based on the residuals $u_t = y_t - x_t'\delta(0)$ (KPSS, 1992).

3.1.2 The Co-integration Tests

Imperatively, the appropriate technique for a co-integration test is predicated on the unit root results. If the results indicate that the variables are integrated at both I(0) and I(1), or fractionally, then the auto-regressive distributed lag (ARDL) bound test may be appropriate (Harris & Sollis, 2003). But where the variables integrate at higher order like I(2), the Engle and Granger (1987) technique is relevant as against the Johansen (1988) approach which is suitable strictly for I(1) variables. Thus, assuming the Johansen co-integration technique is to be used, the process starts with a simple vector auto-regressive (VAR) of order p,

$$y_t = A_1 y_{t-1} + \ldots + A_p y_{t-p} + \beta x_t + \epsilon_t \quad (11)$$

where, at time t, y is a k – vector of I(1) variables, x is a d – vector of deterministic variables, and ϵ is a vector of n x 1 residuals. The VAR may be re-specified as,

$$\Delta y_t = \Pi y_{t-1} + \sum_{r=1}^{p-1} \Gamma_t \Delta y_{t-i} + \beta x_t + \epsilon_t \quad (12)$$

where, $\Pi = \sum_{i=1}^{p-1} A_t - I$, and $\Gamma_i = -\sum_{j=i+1}^{p} A_j$.

Meanwhile, based on likelihood ratio (LR) test, Johansen and Juselius (1990) propose the trace and maximum eigenvalue statistics to test for the number of co-integration vectors in long-run relationship. The statistics are defined as,

$$\theta_{Trace} = -T \sum_{i-r+1}^{n} \log (1 - \theta_i) \quad (13)$$

and

$$\vartheta_{Max} = -Tlog(1 - \theta_{r+1}) \quad (14)$$

Moreover, and consequent upon establishing a long-run equilibrium among the variables, the short-run adjustment can be analyzed using the error-correction model (ECM) as follows.

$$\Delta x_t = \delta_0 + \delta_1 e_{t-1} + \sum_{i=1}^{m} \delta_i \Delta x_{t-1} + \sum_{j=i}^{n} \delta_j \Delta y_{t-j} + e_t \quad (15)$$

$$\Delta y_t = \rho_0 + \rho_1 u_{t-1} + \sum_{i=1}^{m} \rho_i \Delta y_{t-1} + \sum_{j=i}^{n} \rho_j \Delta x_{t-j} + u_t \quad (16)$$

where, using OLS technique, e is residual from regressing x on y while u is the residual from regressing y on x as e_{t-1} and u_{t-1} are the residuals error-correction terms. Essentially, for all i, if $\delta_0 = 0$ and $\delta_i = 0$, x does not Granger-cause y just as y does not Granger-cause x if $\rho_o = 0$ and $\rho_i = 0$ (Granger, 1988).

4. RESULTS

The empirical results are partitioned into pre-estimation and estimation as presented and discussed as follows.

4.1 Pre-estimation Results

The summary statistics, in Table 1, shows that average GDP reached NGN30560 billion in the period. Similarly, average recurrent expenditure on administration, social and community services, economic services, and transfer is approximately NGN458 billion, NGN276 billion, NGN125 billion, and NGN570 billion, respectively.

Table 1: Summary Statistics

	GDP	ADM	SCS	ECS	TRF	GFC
Mean	30560.17	457.9618	276.0577	124.7751	569.5151	1.11E+10
Median	6897.480	180.8000	79.63000	52.95000	203.6900	2.00E+09
Maximum	144210.5	2105.200	1393.560	562.7500	3019.610	3.34E+10
Minimum	144.8300	0.900000	0.290000	0.170000	3.390000	1.45E+09
Std. Dev.	41656.94	569.4265	382.4576	160.8990	772.2601	1.23E+10
Skewness	1.292677	1.087101	1.280082	1.102257	1.656491	0.706222
Kurtosis	3.429367	3.129757	3.437040	3.021917	5.077370	1.727378
Jarque-Bera	11.16117	7.708987	10.96135	7.898095	24.84839	5.873671
Probability	0.003770	0.021184	0.004167	0.019273	0.000004	0.053033
Sum	1191846.	17860.51	10766.25	4866.230	22211.09	4.34E+11
Sum Sq. Dev.	6.59E+10	12321370	5558406.	983763.1	22662654	5.74E+21
Observations	39	39	39	39	39	39

Source: Author's computation.

More so, the output from the unit root tests, as presented in Table 2, reveals that all the series integrate at first difference, that is, I(1).

Table 2: Results of Unit-Root Tests

	ADF			PP			KPSS		
Variable	Level	1st Diff	Order	Level	1st Diff	Order	Level	1st Diff	Order
lGdp	-1.048	-3.208	I(1)	-0.795	-3.122	I(1)	0.745	0.200	I(1)
lAdm	-2.253	-8.070	I(1)	-1.457	-8.300	I(1)	0.736	0.223	I(1)
lScs	-2.165	-8.072	I(1)	-1.514	-12.370	I(1)	0.738	0.500	I(1)
lEcs	-1.180	-7.466	I(1)	-1.587	-8.242	I(1)	0.732	0.243	I(1)
lTrf	-1.092	-8.529	I(1)	-0.984	-8.396	I(1)	0.748	0.123	I(1)
lGfc	-0.317	-4.426	I(1)	-0.671	-4.511	I(1)	0.586	0.108	I(1)

Note: Statistical decisions are based on 5% level of significance.
Source: Author's computation.

Meanwhile, given the result in Table 2, and following Perron (1989) and Kolawole (2020; 2021), Table 3 presents the result of Bai and Perron (2003) tests which confirms that the non-stationarity of the series is actually due to breaks.

Table 3. Result Extract from Bai-Perron Tests

Series	Break Dates	F-stat(1)	Critical value(1)	F-stat(2)	Critical value(2)
LGdp	1993	2417.301	9.13	-	-
LAdm	1999, 2009	2191.166	9.01	58.9917	10.48
LScs	2003	2562.772	9.16	-	-
LEcs	2011	2517.333	9.14	-	-
LTrf	2009	2351.109	9.11	-	-
LGfc	2005	2343.224	9.11	-	-

Source: Author's computation.

Thus, the F-statistics affirm the presence of single break in 1993, 2003, 2005, 2009 and 2011 for *Gdp*, *Scs*, *Gfc*, *Trf* and *Ecs*, respectively, as against multiple breaks in 1999 and 2009 for *Adm* series. It is, however, important to note that if the possibility of structural break is ignored in analysis spanning over thirty years, it may generate misleading inference (Zivot & Andrews, 1992).

Moreover, for the reason to capture the effects of breaks in the respective dates, the comparable equations in Table 4 are estimated. As such, in each equation, *C* is constant term, *T* is time as trend variable, *D* is dummy variable which starts as 1 for the break date as well as the subsequent years, and 0 for the years before the break. Thus, the 1993 dummy is 0 from 1981 to 1992 and 1 from 1993 to 2020; the 1999 dummy is 0 from 1981 to 1998 and 1 from 1999 to 2020; the 2003 dummy is 0 from 1981 to 2002 and 1 from 2003 to 2020; the 2005 dummy is 0 from 1981 to 2004 and 1 from 2005 to 2020; the 2009 dummy is 0 from 1981 to 2008, and 1 from 2009 to 2020; just as the 2011 dummy is 0 from 1981 to 2010, and 1 from 2011 to 2020.

Table 4: Relationship to be Estimated Based Upon Bai-Perron Results

Series	Equations	Break Dates
LGdp	$LGdp_t = \mathrm{C}+D_{1993}+\mathrm{T}+D_{1993}T+\mu_t$	1993
LAdm	$LAdm_t = \mathrm{C}+D_{1999}+D_{2009}+\mathrm{T}+D_{1999}T+D_{2009}T+\mu_t$	1999, 2009
LScs	$LScs_t = \mathrm{C}+D_{2003}+\mathrm{T}+D_{2003}+\mu_t$	2003
LEcs	$LEcs_t = \mathrm{C}+D_{2009}+\mathrm{T}+D_{2009}+\mu_t$	2011
LTrf	$LTrf_t = \mathrm{C}+D_{2009}+\mathrm{T}+D_{2009}+\mu_t$	2009
LGfc	$LGfc_t = \mathrm{C}+D_{2005}+\mathrm{T}+D_{2005}+\mu_t$	2005

Source: Author's representation.

Incidentally, the break in *Gdp* is ascribed to economic fluctuations which slides output from approximately USD150.6 billion in 1992 to USD147.6 billion in 1993 with rate of growth slowing from 4.6% to negative 2%, respectively (World Bank, 2021). As regard the breaks in *Adm*, there is actually a spike in 1999 which results mainly from the addition of NGN6.02 billion as NASS spending along with NGN85.79 billion, NGN53.6 billion, and NGN38.66 billion from general administration, defence, and internal security components, respectively. As such, a spike of NGN183.64 billion in 1999 from a mere NGN50.68 billion in 1998 triggers the break. The 2009 break in *Adm* is, however, traced to sudden disappearance of NASS spending which momentarily causes a reduction from NGN731.02 billion in 2008 to NGN714.42 billion in 2009. Moreover, the 2003 break in *Scs* is linked to the sudden drop in recurrent expenditure allocation to this category from NGN152.19 in 2002 to NGN102.61 billion in 2003. Imperatively, the breaks in *Ecs* results from recovery from huge election spending which causes allocation to slide to NGN310.5 billion in 2011 from NGN562.75 billion in 2010. Nonetheless, the break in *Trf* in 2009 is ascribed to the reduction in spending from NGN739.66 billion in 2008 to NGN635.75 billion in 2009 despite the first-time inclusion of the transfer of NGN214.54 billion and NGN37.25 billion to the domestic and foreign units, respectively (CBN, 2020).

Table 5: Unrestricted Co-integration Rank Test (Trace).

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.821256	146.1842	95.75366	0.0000
At most 1 *	0.689665	82.47761	69.81889	0.0035
At most 2	0.433777	39.18378	47.85613	0.2530

Note: CE = co-integrating equation.
Source: Author's computation.

Meanwhile, the Johansen co-integration trace and maximum eigenvalue results in Tables 5 and 6 affirm long-run relationship among the variables with two co-integrating equations.

Table 6: Unrestricted Co-integration Rank Test (Maximum Eigenvalue).

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.821256	63.70654	40.07757	0.0000
At most 1 *	0.689665	43.29382	33.87687	0.0028
At most 2	0.433777	21.04442	27.58434	0.2735

Note: CE = co-integrating equation.
Source: Author's computation.

Also, towards ascertaining the causal relationship between a respective pair of the variables, majority of the lag length selection criteria choose 2, as presented in Table 7.

Table 7: Lag Order Selection Criteria.

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-158.5811	NA	0.000294	8.896278	9.157508	8.988373
1	25.58851	298.6535	1.01e-07	0.887107	2.715717*	1.531778
2	73.23708	61.81435*	6.29e-08*	0.257455*	3.653444	1.454700*

Source: Author's computation.

Furthermore, the pairwise Granger-causality output, in Table 8, shows the rejection of the null hypothesis that expenditure on transfers does not Granger cause economic growth. This, in line with the Keynesians view, implies that government size regarding recurrent expenditure on transfers Granger-causes economic growth. On the contrary, economic growth appears to Granger-cause recurrent expenditure on social and community services, thereby affirming the Wagner's law and corroborating Nyasha and Odhiambo (2019). Nonetheless, a no-causal

relationship is established between the pairs of growth and recurrent expenditure on administration; growth and recurrent expenditure on economic services; and growth and government final consumption expenditure. This conforms to the view of Agell, Lindh and Ohlsson (1995) and Taban (2010), among others, who find a no-relationship between government size and economic growth.

Table 8: Pairwise Granger-causality Between Government Size and Economic Growth.

Null Hypothesis:	F-Statistic	Prob	Decision
LADM does not Granger Cause LGDP	3.10196	0.0587	Cannot reject
LGDP does not Granger Cause LADM	2.41874	0.1051	Cannot reject
LSCS does not Granger Cause LGDP	1.36641	0.2695	Cannot reject
LGDP does not Granger Cause LSCS	9.14665	0.0007	Reject
LECS does not Granger Cause LGDP	2.87811	0.0709	Cannot reject
LGDP does not Granger Cause LECS	1.75253	0.1896	Cannot reject
LTRF does not Granger Cause LGDP	15.8854	2.E-05	Reject
LGDP does not Granger Cause LTRF	0.00523	0.9948	Cannot reject
LGFC does not Granger Cause LGDP	0.61783	0.5454	Cannot reject
LGDP does not Granger Cause LGFC	2.03638	0.1471	Cannot reject

Note: Statistical decisions are based on 5% level of significance.
Source: Author's computation.

4.2 Estimation Results

Consequent upon the co-integration test, the error correction (ECM) estimation output is presented in Table 9.

Table 9: The Relationship Between Government Size and Economic Growth: The ECM.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.015509	0.027673	0.560442	0.5796
D(LGDP(-1))	0.482535	0.130155	3.707377	0.0009
D(LGDP(-2))	0.237068	0.139205	1.703013	0.0996
D(LADM(-2))	0.057819	0.039071	1.479856	0.1501
D(LSCS(-1))	-0.050099	0.022257	-2.250977	0.0324
D(LECS(-1))	0.082738	0.025910	3.193352	0.0035
D(LTRF(-2))	0.139663	0.046536	3.001167	0.0056
ECM(-1)	-0.282235	0.126408	-2.232735	0.0337

Note: Statistical decisions are based on 5% level of significance.
Source: Author's computation.

Thus, as a short-run dynamic analysis, the immediate past value of economic growth significantly propels the current year growth positively as expected. In essence, the parsimonious results show that the immediate past year recurrent expenditure on social and community services significantly impacts negatively on economic growth in the current year. That is, as government size increases with 100% spending on social and community services last year, economic growth reduces this year by 5 percentage point. Essentially, at the empirical front, the result supports Fall and Fournier (2015) and Olawole, Adebayo and Idowu (2018) who find a negative relationship between government size and economic growth in OECD countries and Nigeria, respectively. However, as negative association is not causality, Johansson (2016) cautions that while reflecting automatic stabilisers, a negative relationship is expected between government size and growth in the short-run. On the contrary, however, a positive relationship is revealed between government size one year ago, as regard recurrent expenditures on economic services and transfers, and economic growth in the current year. This

finding, theoretically, follows Myles (2009) and corroborates the empirical view of Teles and Mussolini (2014), Kolawole and Odubunmi (2015) and Kolawole (2016) on the positive effects of productive spending on growth in developed and developing countries. As such, a 100% increase in recurrent expenditure on economic services in the preceding year brings about 8 percentage point improvement in economic growth in the current year.

Similarly, a 13-percentage point expansion in growth is achieved in the current year as a result of a 100% addition to recurrent expenditure meant for transfers in the immediate past year. Incidentally, however, the impact of recurrent expenditure on administration in the last two years would have been positive on growth in the current year, were it statistically significant. Nonetheless, the presence of shock to the system takes the model a short period with a speed of 28% to adjust back to long-run equilibrium given the coefficient of the ECM term.

Table 10: OLS Results from the Estimation of Equations in Table 4.

Series	C	C-1993	C-1999	C-2003	C-2005	C-2009	C-2011	T	T-1993	T-1999	T-2003	T-2005	T-2009	C-2011
LGdp	0.01	0.02**	-	-	-	-	-	-1.2	0.06**	-	-	-	-	-
LAdm	0.01	-	0.11**	-	-	0.04**	-	-1.2	-	0.21**	-	-	0.31**	-
LScs	0.01	-	-	0.14**	-	-	-	-1.2	-	-	0.03**	-	-	-
LEcs	0.01	-	-	-	-	-	0.11**	-1.2	-	-	-	-	-	0.13**
LTrf	0.01	-	-	-	-	0.01**	-	-1.2	-	-	-	-	0.02**	-
LGfc	0.01	-	-	-	0.22**	-	-	-1.2	-	-	-	0.01**	-	-

Note: * and ** denote significance at 1 and 5%, respectively.
Source: Author's computation.

Imperatively, in comparison with the baseline ECM results, the outcome of the estimation of equations in Table 4, as well as the effects of the breaks, are presented in Tables 10 and 11, respectively. As it stands in Table 10, the C and T columns show values of ECM estimates, while columns C- and T- for 1993, 1999, 2003, 2005, 2009 and 2011 indicate the statistically significant values as departure from the baseline. In effect, the departure from the baseline result shows in Table 11 that, despite the break, recurrent expenditure on transfers consistently impacts positive on economic growth. Also, general government final consumption expenditure appears significant over the break period relative to the baseline scenario. Furthermore, recurrent expenditure on social and community services appears positively significant at 1% during the break period. However, as the break effectively causes expenditure on administration to impact negatively, it rather makes economic services insignificant, on economic growth.

Meanwhile, in comparison with earlier studies, the negative relationship between government size and economic growth is consistent with the findings of Olawole, Adebayo and Idowu (2018). However, as economic growth causes expenditure on social and community services, it corroborates Nyasha and Odhiambo (2019) who claim unidirectional causality running from economic growth to government size. But then, the corroborating results notwithstanding, this study departs from other studies regarding the use of Bai-Perron structural break methodology. Unlike in the findings of previous studies, the Bai-Perron methodology helps reveal the consistent positive impact of transfer payment on economic growth.

Table 11: OLS Results of the Effect of Breaks

Variable	Coefficient	Std Error	t-Statistic	Prob
LGdp(-1)	598.4298	586.5686	1.020221	0.3153
LAdm	-36.57902	12.70727	-2.878591	0.0071
LScs	81.36567	12.06512	6.743874	0.0000
LEcs	13.29404	12.33137	1.078066	0.2891
LTrf	31.25147	4.146537	7.536764	0.0000
LGfc	4.34E-07	1.82E-07	2.386188	0.0231
Adj R^2	0.79			
F-stat	652.02			0.000
DW	1.33			

Note: Statistical decisions are based on 5% level of significance.
Source: Author's computation.

5. DISCUSSION AND CONCLUSION

This study assesses the relationship subsisting between government size and economic growth in Nigeria using co-integration and ECM techniques on time series data covering the period 1981-2020. Findings reveal that federal government is over-burdened with responsibilities which could be handled by the states and local government authorities. For instance, as social and community services does not Granger-cause growth, it however impacts growth negatively in the ECM analysis. As such, the situation reflects the concerns about downsizing federal government's activities in the exclusive list. More so, findings show that expenditure allocations to ministries, departments and agencies (MDAs) are guided by the core objectives of restoring and sustaining growth, and building a globally competitive economy in relation to the reflationary & consolidation policies of the 2017, 2018 and 2019 budgets. Incidentally, transfer propels growth as 2019 budget allocations show that personnel costs, including pension and gratuities, gulp approximately 72% of recurrent non-debt expenditure. Therefore, while on the one hand a positive relationship is achieved from certain components of recurrent expenditure, on the other hand a negative relationship is established from some components to growth. Thus, it appears apparent that a mixed relationship subsists between government size and economic growth in Nigeria.

Nonetheless, given that social and community services impact negatively on economic growth, it implies that government recurrent expenditure on education, health and other community services drag growth backward. As such, in order to reverse the negative impact, federal government should concentrate more on education and health due to the fact that the two sub-sectors are basic growth and development indices. In addition, since recurrent expenditure on administration is not impactful, then efforts should be geared towards adoption of a unicameral legislature for cost and size reduction. Moreover, it is however, established that recurrent expenditure on economic services impact positively on growth thereby implying that public spending on agriculture, road & construction, transport & communication, and other economic services promote growth. Thus, the federal government should increase budgetary allocations to economic services in order to boost productivity and economic growth. Also, the positive impact of recurrent expenditure on transfers implies that the spending is productive. Government should, therefore, spend more on transfers so as to grow the economy.

REFERENCES

Abu-Eideh, O.M. (2015). Causality between public expenditure and gdp growth in Palestine: An econometric analysis of Wagner's law. *Journal of Economics and Sustainable Development,* 6, 189-199.

African Economic Outlook [AEO] (2021). *From debt resolution to growth: The road ahead for Africa.* African Development Bank [AfDB]. Retrieved September 07, 2021 from http://www.africaneconomicoutlook.org.

Agell, J., Lindh, T., & Ohlsson, H. (1995). Growth and the public sector: A critical review essay. *European Journal of Political Economy,* 13, 33-52.

Alimi, R. S. (2014). Does optimal government size exist for developing economies? The case of Nigeria. Munich Personal RePEc Archive *MPRA Paper* No. 56073, 1-18.

Amadeo, K. (2019). *Budget deficits and how to reduce them: Causes and effects*. Retrieved September 02, 2021 from https://www.thebalance.com/budget-deficit-definition-and-how-it-affects-the-economy-3305820.

Awomuse, B.O., Olorunleke, K., & Alimi, R.S. (2013). The effect of federal government size on economic growth in Nigeria, 1961-2011. Munich Personal RePEc Archive *MPRA Paper* No. 53467, 1-11.

Bai, J., & Perron, P. (2003). Computation and analysis of multiple structural change models. *Journal of Applied Econometrics,* 6, 72–78.

Barro, R.J. (2015). Convergence and modernisation. *The Economic Journal,* 125, 911-942.

BigBen, C.O. (2014). Inflation dynamics and government size in Nigeria. *International Journal of Economics, Commerce and Management,* II(*12*), 1-22.

Brennan, G., & Buchanan, J.M. (1980). *The power to tax: Analytical foundations of a fiscal constitution*. Cambridge: Cambridge University Press.

Campbell, J.Y., & Perron, P. (1991). Pitfalls and opportunities: What macroeconomists should know about unit roots. In Blanchard, O.J., & Fischer, S. (eds.), *NBER Macroeconomics Annual,* pp. 141–201, Cambridge, MA 14: MIT Press.

Central Bank of Nigeria [CBN] (2020): *Statistical bulletin*. Retrieved March 22, 2022 from https://www.cbn.gov.ng/documents/statbulletin.asp.

Chen, J. (2020). Research on the relationship between government size and economic growth. *Modern Economy,* 11, 209-219. Doi: 10.4236/me.2020.112018.

Dickey, D.A., & Fuller, W.A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association*, *74*, 427-431.

Dogo, M. Y., Okpanachi, U.M, Muhammad, A.A., Umolu, C.V., & Ajayi, K.J. (2013). Government size and economic growth in Nigeria: A test of Wagner's hypothesis. Central Bank of Nigeria *Economic and Financial Review*, 57-85.

Engle, R.F., & C.W.J. Granger (1987). Co-integration and error-correction: Representation, estimation and testing. *Econometrica*, 55, 251-276.

Fall, F., & Fournier, J.M. (2015). Macroeconomic uncertainties, prudent debt targets and fiscal rules. *OECD Economics Department Working papers,* No. 1230, OECD Publishing, Paris.

Fournier, J-M., & Johansson, A. (2016). *The effect of the size and mix of public spending on growth and inequality.* OECD Department of Economics Working Paper No. 1344, ECO/WKP(2016)68.

Garrett, T.A., & Rhine, R.M. (2006). On the size and growth of government. Federal Reserve Bank of St. Louis *Review, 88*(1), 13-30.

Granger, C.W. (1988). Some recent development in a concept of causality. *Journal of Econometrics*, 39. 199-211.

Harris, R., & Sollis, R. (2003). *Applied time series modelling and forecasting*. Wiley: West Sussex.

Herath, S. (2012). Size of government and economic growth: A nonlinear analysis. *Economic Annals,* LVII(194).

Heritage Foundation (2021). *Nigeria.* Retrieved August 30, 2021 from https://www.heritage.org/index/country/nigeria.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economics, Dynamics and Control*, 12, 231-54.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and interference on cointegration with application to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169-210.

Johansson, A. (2016). *Public finance, economic growth and inequality: A survey of the evidence*. OECD Department of Economics Working Paper No. 1346, ECO/WKP(2016)70.

Kolawole, B.O., & Odubunmi, S.A. (2015). Government capital expenditure, foreign direct investment, and economic growth relationship in Nigeria. *Mediterranean Journal of Social Sciences,* 6(*4S3*), 444-453. Doi:10.5901/mjss.2015.v6n4s3p444.

Kolawole, B.O. (2016). Government spending and inclusive-growth relationship in Nigeria: An empirical investigation. *Zagreb International Review of Economics & Business, 19*(2), 33-56. Doi: 10.1515/zireb-2016-0007.

Kolawole, B.O. (2020): Effect of budget deficit on economic growth in Nigeria. *LASU Journal of Economics, 2*(1), 17-32.

Kolawole, B.O. (2021). Fiscal stability and macroeconomic environment in Nigeria: A further assessment. *Review of Business & Management TMP*, *17*(2), 53-66.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P., & Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root. *Journal of Econometrics,* 54(*1-3*), 159-178.

Loizides, J., & Vamvoukas, G. (2005). Government expenditure and economic growth: Evidence from trivariate causality testing. *Journal of Applied Economics, 8*(3), 125-152.

Myles, G. (2009). Economic growth and the role of taxation. *OECD Economics Department Working papers,* No. 713, OECD Publishing, Paris.

National Bureau of Statistics [NBS] (2021). *Key statistics: Gdp, unemployment, cpi.* Retrieved August 10, 2021 from https://www.nigerianstat.gov.ng.

Nelson, C., & Polsser, C. (1982). Trends and random walks in macroeconomic time series: Some evidence and implications." *Journal of Money Economics,* 10, 139-162.

Nurudeen, A., & Usman, A. (2010). Government expenditure and economic growth in Nigeria, 1970-2008: A disaggregated analysis. *Business and Economics Journal, BEJ*-4.

Nwosa, P. I., & Akinbobola, T. O. (2020). Globalisation and government size in Nigeria: A revisit of the compensation hypothesis. Central Bank of Nigeria *Economic and Financial Review*, 58(1), 39-55.

Nyasha, S., & Odhiambo, N.M. (2019). Government size and economic growth: A review of international literature. *SAGE Open*, 1–12. DOI: 10.1177/2158244019877200.

Olawole, K.O., Adebayo, T.O., & Idowu, O.S. (2018). Openness, government size and economic growth in Nigeria. *Journal of Finance & Economics Research*, 3(1), 71-84. DOI: 10.20547/jfer1803105.

Perron, P. (1989). The great crash, the oil price shock, and the unit root hypothesis. *Econometrica: Journal of the Econometric Society,* pp.1361-1401.

Phillips, P.C.B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, *75*, 335-346.

Salih, M.A.R. (2012). The relationship between economic growth and government expenditure: Evidence from Sudan. *International Business Research,* 5(*8*), 40-46.

Samudram, M., Nair, M., & Vaithiligam, S. (2009). Keynes and Wagner on government expenditures and economic development: The case of a developing economy. *Empirical Economics, 36*(2), 697-712.

Stock, J.H., & Watson, M.W. (1988). Testing for common trends. *Journal of American Statistical Association*, 83, 1097-1107.

Taban, S. (2010). An examination of the government spending and economic growth nexus for Turkey using the bound test approach. *International Research Journal of Finance and Economics*, *48*, 184-193.

Teles, V.K., & Mussolini, C.C. (2014). Public debt and the limits of fiscal policy to increase economic growth. *European Economic Review,* Vol. 66.

Udoma, U.U. (2019). *Breakdown of 2019 fgn budget proposal*. Retrieved September 13, 2021 from https://www.proshareng.com/admin/upload/report/11888HMBNP2019EBPPublicPresentationReviewed191218FINAL1-proshare.pdf.

World Bank (2021). World development indicators. Retrieved August 29, 2021 from https://datacatalog.worldbank.org/dataset/world-development-indicators.

Zivot, E., & Andrews, D.W.K. (1992). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business and Economic Statistics,* 10, 251-270.