Disaggregated Impact of Government Expenditure on Economic Growth: Evidence from Nigeria

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Abstract

The quest to accelerate the pace of development of the economy in a bid to transform Nigeria into the group of developed economies by achieving certain macroeconomic objectives had called for increasing government expenditure in the provisions of public goods for the people and the nation. In view of the role of public expenditures on national progress and prosperity, this study empirically examined the disaggregated impact of the expenditures on economic growth in Nigeria for the period 1986-2021 using ARDL model as a tool for analysis. The important findings from the study suggest that capital and recurrent expenditures on community, social and economic services significantly boost economic growth in both short and long runs but the recurrent expenditure is negatively significant in the short run. Similarly, recurrent expenditure on community, social and economic services is also positively and significantly related with real GDP. Although capital and recurrent expenditures on administration and transfer are found to retard economic growth in the short run; they turn out to significantly enhance national output in the long run. Other findings from the study revealed that capital stock significantly promotes growth whereas labour slows down the growth across both short and long runs. The study recommends that government should lay a solid foundation and provide a workable business ground for individuals and firms. Government should also pay attention to finance growth enhancing spending categories such as infrastructure, research and development, education and health that would enhance human development in the country.

Keywords: ARDL, Capital Expenditure, Recurrent Expenditure, Economic Growth.
JEL Classification: C32, H54, H50, O40, O41

1. Introduction

Pursuing sustainable economic growth and development through government intervention is one of the main approaches deplored by developmental state. The state

intervenes to correct market failures in the process of resource allocation and income distribution (Akpan, 2005; Jibir & Aluthge, 2019a). Government spending is essential for boosting the economy. The amount of overall government spending allotted to economic development initiatives will determine how government spending is expected to influence economic development (Taiwo & Agbatogun, 2011). Government spending is divided into capital and recurrent expenditure. The capital spending is the expenditure on capital projects like roads, hospitals, health etc.,whereas recurrent expenditure is government spending on wages, salaries, maintenance and so on.

Evidence suggests that rising government spending over time tends to boost economic development and growth. For instance, it is anticipated that spending on health and education will increase national productivity through improvement in both labour productivity and quality. Additionally, spending on infrastructure projects like roads, communications, power, water, and other similar projects will lower production costs and boost company profitability, enhancing economic growth and development ((Udoffia & Godson, 2016; Jibir & Aluthge, 2019b).

A cursory view of available statistics reveal that public expenditure has been and still on the upswing. For instance, public recurrent spending rises to N6.8 trillion in 2022 from N4.85 billion in 1981, N579.3 billion in 2001, N147 billion in 2010 and N221.5 billion in 2015 (Central Bank of Nigeria, CBN, 2022). In the same token, public capital spending soars to 4.8 trillion in 2022 from N6.57 billion in 1981, N438.7 billion in 2001 and N883.87 billion in 2010. Before then, it has dipped to N818.35 billion in 2015 and N622.13 billion in 2020 from its 2010 level (CBN, 2022). The reductions could be linked to 2014/15 economic recession in Nigeria and COVID-19 pandemic in 2020. In spite of these, the rising trend in both recurrent and capital expenditures in Nigeria, has commensurate with the improvements in the welfare of Nigerians, but poverty rate on the other hand escalates to 39.8 percent in 2019 from 36.5 percent in 2015 (World Bank, 2022).

A number of studies have looked at the nexus between government spending and economic growth, particularly in Nigeria (Abu & Abdullahi, 2010; Ighodaro & Oriakhi, 2010; Ogunrinola, 2011; Modebe, Okafor, Onwumere & Ibe, 2012; Nworji & Oluwalaiye, 2013; Okoro, 2013; Tajudeen & Ismail, 2013; Agbonkhese & Asekome, 2014; Aluthge *et al.,* 2021; Ahuja & Pandit, 2020). Some studies found a negative connection between government expenditure and economic growth (Ighodaro & Oriakhi, 2010; Jibir & Babayo, 2015; Tajudeen & Ismail, 2013; Agbonkhese & Asekome, 2014). Nonetheless, other studies reveal a positive relationship between public spending and national output growth (Oni, Aninkan, & Akinsanya, 2014; Okoye *et al*., 2019; Robinson *et al,* 2014; Udoffia & Godson, 2016). Other studies find conflicting results (Modebe, *et al.,* 2012; Ogunrinola, 2011; Ugochukwu & Oruta, 2021). As such causing disparity in their conclusions, indicating the need for further research in the field of this study.

Against this backdrop, this paper seeks out to examine the impact of disaggregated government expenditures on economic growth in Nigeria. This study focuses on capital and recurrent expenditures on social, community and economic services, and capital and recurrent expenditures on administration and transfer). Following introduction, the remaining parts of the paper are organised as follow: section 2 is literature review while section 3 and 4 consist of methodology and analysis of the result respectively. The last section of the paper entails discussion of the findings, conclusion and policy recommendations.

2. Literature Review

Empirical Review

There are burgeoning studies on the relationship between government expenditures and national output growth, at country and cross-country level. For example, Poku, Opoku, and Ennin (2022) used the ARDL technique to evaluate the link between public expenditure and economic growth for the period 1970-2016. Their findings indicate that public expenditure positively and significantly correlates with economic growth in the short-run. In a panel analysis comprising 16 Asian Emerging Markets and Developing Economies (EMDEs), Nguyen and Bui (2022) analyzed the moderating role of corruption control in the impact of public spending on economic growth for the period 2002–2019. While applying Generalized method of moments (GMM) and threshold analysis, the study establishes a negative effect of government expenditure and corruption control on economic growth. The results of threshold analysis, however, reveals two threshold values (-0.61 and 0.01) for corruption control. This suggests a positive impact of government expenditure on economic growth if corruption control in the countries is above the threshold value of 0.01. In a related study, Shkodra, Krasniqi and Ahmeti (2022) investigated the effect of government expenditure on economic growth in a group of 7 Southeast European (SEE) countries for the period 2002-2019. Their findings revealed that government expenditure enhances economic growth.

Jiranyakul (2017) conducted a nonlinear relationship study between public receipts and expenditure for Thailand during the period of 1993 and 2016. The study advocates for the fiscal synchronization model in the revenue-expenditure nexus; with disproportionate adjustments to the long-run convergence. The study analyse the data using threshold auto-regressive (TAR) and momentum threshold auto-regressive (MTAR) models. The study proves the presence of asymmetric long-run connection between public revenue and expenditure, they both react to budget alteration due to enhancement in fiscal discipline. Samal (2017) used Autoregressive Distributive Lag (ARDL) Model and Granger causality test to empirically explore the causal relationship between public expenditure and government revenue in India from 1980 to 2016. The study found out that public expenditure significantly boosts public revenue across both long and short run, which aligns with spend tax hypothesis. The ARDL-granger-based causality test result shows a bidirectional causality between government expenditure and government revenue in the short run and in the long run. This supports fiscal

synchronization hypothesis that proposes that revenue and expenditure decisions should be taken at once by the government.

In another study conducted by Ndoricimpa (2017) wherein three–variable model approach is deplored to test for the presence of asymmetries in the tax-expenditure nexus in Burundi. The study found out that government spending, taxes and grants co-move t in the long run, with unbalanced adjustment. The short run causality result proves independence of taxes from public expenditure and vice versa in Burundi. Therefore, this finding aligns with the fiscal neutrality hypothesis. While utilizing error correction model and ordinary least square method with the theoretical framework of Keynesian principles and Wagner's law, Dikeogu *et. al.* (2016) observes that the disaggregated public expenditure significantly effects economic growth in Nigeria.

There are some empirical evidence upholding the Wagner's Law in different countries on the globe (such as Obeng & Sakyi, 2017; Jalles, 2019). Their findings show that the level of economic growth and development of a country significantly influences the size of public expenditure. Lahirushan and Gunasekara (2015) studied the impact of government expenditure on national output growth of some selected Asian countries. The study finds an evidence supporting both Keynesian and Wagner's hypothesis in short run. On the contrary, Pelawaththage (2019) establishes a negative connection between national income and public expenditure. Applying VECM framework on Nigerian data for the period 1980-2014, Yinusa and Adedokun (2017) examines the fiscal stance of Nigeria within the various fiscal hypotheses. The study reveals a one-way causality from government revenue to public spending. This upholds the tax-spending hypothesis. In conclusion, the empirical examination on the actual nexus between government spending and economic growth is contradictory and ambiguous. Accordingly, the analytical technique used and the classification of public spending, and data used contributed to the inconsistent findings, hence, the need for this study.

Stylized Facts on Economic Growth and the Size of Public Expenditure in Nigeria
Wagner (1883) was the first economist that theorized the influence of level of economic growth and development on public sector expansion. Since his pioneering work in 1883, volume of empirical studies have studied the nexus between economic growth and public expenditure with mixed findings (see Barro, 1990; Folster & Henrekson, 2001; Forte & Magazino, 2016; Grossman, 1988; Mackness, 1999; Peden & Bradley, 1989). Furthermore, with the emergence of Keynesian doctrine, governments all over the world have been using public expenditure as a tool for influencing the level of aggregate consumption and investment.

Nigerian economy has experienced growth in real output in some years and declined in other years. However, the overall picture shows a low performance which can be deduced from high level of income inequality, poverty, unemployment, macroeconomic instabilities, among others. The oil boom of 1970s pushed Nigeria into higher income countries. However, with the fall in oil price over time resulting to low foreign earnings in the recent decades, Nigeria has now been categorized as a low income country (NBS,

2016). The country has also faced severe macroeconomic instabilities, heavy debt burden and political instability which continue to pose serious challenges in achieving sustainable growth and development.

Figure 1: Annual Growth Rate of Nigerian Economy (1960-2021)

Source: The authors' computation from World Development Indicators, 2022.

Figure 1 depicts the trend of annual growth of real GDP of Nigeria from 1960 to 2022. The average rate of economic growth in the 1960-69 was 2.8 percent. The economy fell into recession in 1966/67 as the real RGDP reduced by 16 percent in 1967. This could be linked to the civil war of 1960s. This increased to an average of 7 percent during the decade of 1970s (World Bank, 2022). This is attributed to oil boom of 1970s and large budgetary allocation and development plans to meet developmental challenges and post war rehabilitations. Average public expenditure between 1960 and 1970 was ₦314.4133 billion but it rose to ₦5972.9 billion during the decade of 1970s which shows 1800 percent increase (CBN, 2020). Economic take off was predicted partly due to cheap money accrued from the oil sub-sector.

However, the impressive performance of the 1970s was not sustained, the 1980s witnessed a dropped in growth rate by -0.93 percent. This cannot be unconnected with the implementation of SAP and decline in government spending to curb deficit financing. More so, the neglect of agriculture after oil discovery has also conduced to the decline in output during the period. The growth rate of government expenditure on average was only 87 percent and 199 percent between 1980-85 and 1986-90 respectively with about 1500 percent decrease compared with the previous decade (CBN, 2020).

The decade of 1991-2000 was characterized with high level of macroeconomic instabilities with inflation reaching the highest level so far in the country's history with the record of 72 percent in 1995. The growth rate of Nigerian economy was only 1.9 percent. Government expenditure was reduced purposely in order to curb inflationary pressure. The growth rate of government expenditure on average was 354 percent between 1991 and 1996 but it declined to 281 percent between 1996 and 2000 (CBN, 2020). Since Nigeria's return to democracy in 1999, significant progress has been recorded especially in the service sector of the economy. The average growth rate of

Nigerian economy between 2001 and 2010 was about 8 percent. This may be as a result of inflow of oil money that is due to increase in the price of oil in the international market and large budgetary allocations to meet the aspiration of voters. Furthermore, the growth rate of the economy between 2011 and 2016 declined to 4.7 percent. In the same vein, there had been decline in average growth of government expenditure from 121 percent in 2006-2010 to 58 percent during 2011-2016 period. During the periods, recurrent expenditure dominated the spending structure of the country. While the growth rate of recurrent expenditure was 88.3 percent, capital expenditure growth rate dropped by -0.63. Government has spent more than 70 percent of its budgetary allocations on recurrent expenditure which was mainly used in servicing politicians' demand through their jumbo allowances and salaries (see El-rufai, 2011). It can be deduced that increase in the level of economic growth has a direct correlation with expansion in government spending as theorized by Wagner (1883). Thus, it can be said that the overall performance of Nigerian economy is not impressive despite large budgetary allocations over the years. It is therefore not sufficient to conclude that Nigeria's level of growth and development has induced expansion of government spending as postulated by Wagner (1883) or the reverse as advanced by Keynes (1936). This purely remains an empirical question which the present study plans to answer in the subsequent section of this paper. The decade of 2011-2020 records a moderate growth rate of just 2.7 percent, with some episodes of recession in 2016 and 2020 when the economy shrank by 1.6 and 1.8 percent respectively (World Bank, 2022). These were brought about by global economic crisis of 2015/16 and COVID-19 pandemic.

3. Methodology

There are numerous growth theories that explicitly described the role of government on economic growth. The neo-classical model of economic growth developed by Solow (1956) omitted fiscal variables in growth process. However, the recent development in favour of significant relationship between government expenditure and economic growth has led to inclusion of public expenditure in explaining economic growth which has been known as endogenous growth model (see Barro, 1990; 1991). The explosion of empirical studies on endogenous growth model over the years has led to a distinction of government expenditure into productive and unproductive expenditures. Furthermore, studies such as Devarajan, *et al.* (1996) and Nurudeen and Usman (2010) have gone beyond this simple classification in analysing the effect of government expenditure on economic growth. Productive and unproductive expenditures are also disaggregated partly to explore and figure out the components that are growth-enhancing. This present study also follows the above pattern by analysing the effect of both the aggregate and disaggregate components of capital and recurrent expenditures on economic growth. In this regard, this chapter is divided into three sections. The first section deals with trend analysis of capital and recurrent expenditures of Nigeria followed by the empirical analysis of their impact on economic growth. The last section presents empirical analysis of the disaggregated impact of capital and recurrent expenditures on economic growth of Nigeria.

The data for the analysis are sourced from Central Bank of Nigeria Statistical Bulletin and World Bank Development Indicators for the period 1986 to 2016 for which data are available. In order to bring out clearly the disaggregated effect of public expenditure components on economic growth, equation 1 is re-specified in order to capture the disaggregated components of capital and recurrent expenditures. Thus:

$$lnRGDP_1 = \alpha_0 + \alpha_1 lnK_t + \alpha_2 L_t + \alpha_3 lnCESCECO_t + \alpha_4 lnRESCECO_t + \alpha_5 lnCEAMTRA_t + \alpha_6 ln\,REAMTRA_t + \mu_t \dots\dots\dots 1$$

Where: RGDP = Remains as earlier defined, K= Private Capital Stock, L = Labour, CESCECO = Capital expenditure on social, community and economic services, RESCECO = Recurrent expenditure on social and community services, CEAMTRA = Capital expenditure on administration and transfer, REAMTRA = Recurrent expenditure on administration and transfer, μ = error term.

Estimation Procedure
As expounded previously, the ARDL approach requires not all variables to be integrated of order one as it could be applied on variables that are integrated at order 0 and 1. Note that ARDL cannot be applied on variables that are integrated at order two or higher. Therefore, ADF and Phillips-Peron tests are utilized, in this study, to detect the order of integration of the variables in the model.

ARDL Bonds test
The study employs ARDL model to compute short- and long-run effects of the explanatory variables on economic growth. Equation 2 provides a general framework for ARDL specification of the effect of disaggregated capital and recurrent expenditure components on economic growth of Nigeria.

$$lnRGDP_1 = \alpha_0 + \sum_{i=1}^{o} \alpha_1 \ln RGDP + \sum_{i=1}^{P} \alpha_2 lnK_{t-1} + \sum_{i=0}^{q} \alpha_3 lnL_{t-1} + \sum_{i=0}^{r} \alpha_4 lnCESCECO_{t-1} + \sum_{i=0}^{s} \alpha_5 lnRESCECO_{t-1} + \sum_{i=0}^{t} \alpha_6 lnCEAMTRA_{t-1} + \sum_{i=0}^{u} \alpha_7 ln\,REAMTRA_{t-1} + \mu_t \dots\dots 2$$

Where: RGDP, K, L, CESCECO, RESCECO, CEAMTRA and REAMTRA remain as previously defined. α indicates the drift, o, p, q, r, s, t, and u denotes the lag lengths, β, ϕ, χ, δ, ϒ, λ and θ are coefficients to be estimated while ln represents natural logarithms and μ_t is the random error term.

Equation 3 is the specification of the short run of ARDL approach to co-integration in error correction form

$$\Delta lnRGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln RGDP_{t-i} + \sum_{i=1}^{P} \alpha_2 \Delta lnK_{t-i} + \sum_{i=1}^{p} \alpha_3 \Delta lnL_{t-1} + \sum_{i=1}^{p} \alpha_4 \Delta lnCESCECO_{t-i} + \sum_{i=1}^{p} \alpha_5 \Delta lnRESCECO_{t-i} + \sum_{i=1}^{p} \alpha_6 \Delta lnCEAMTRA_{t-i} + \theta ECM_{t-i} + \mu_t \dots\dots 3$$

ECM designates the error correction term.

4. Result and Discussions
Unit Root Tests

As stated earlier, the first step of empirical analysis involves the examination of the statistical properties of all the variables included in the model. Real GDP, labour force and capital stock are excluded because they were already analyzed and are found to be stationary in the first growth model. But other variables such as capital expenditure on community, social and economic services, recurrent expenditure on community, social and economic services, capital expenditure on administration and transfer and recurrent expenditure on administration and transfer were analysed using both ADF and PP tests, the results are presented in table 1 and 2 respectively.

Table 1: ADF Unit Root Test

ADF Statistic		lnCESCECO	lnRESCECO	lnCEAMTRA	lnREAMTRA
At Level	Intercept	-1.4698	0.3116	-0.7994	2.3712
		[0.5348]	[0.9750]	[0.8043]	[0.9999]
	Trend &	-2.3263	-1.6254	-3.3733	-0.6519
	Intercept	[0.4080]	[0.7586]	[0.0779]	[0.9668]
	None	-0.4817	1.5391	0.4408	4.1495
		[0.4986]	[0.9665]	[0.8029]	[0.9999]
	Remark	Non-stationary	Non-stationary	Non-stationary	Non-stationary
At First Difference	Intercept	-6.0881***	-4.2116***	-8.8296***	-4.8104***
		[0.0000]	[0.0027]	[0.0000]	[0.0006]
	Trend &	-6.0447***	-4.2600**	-3.4392*	-5.6235***
	Intercept	[0.0002]	[0.0112]	[0.0707]	[0.0005]
	None	-6.0938***	-3.8043***	-8.6024***	6.0807**
		[0.0000]	[0.0005]	[0.0000]	[0.0184]
	Remark	Stationary	Stationary	Stationary	Stationary

*Note: Values in parenthesis are the probability values while ***, ** and * denote level of significance at 1%, 5% and 10% respectively.*
Source: Authors' Computation

From Table 1, it can be seen that the null hypothesis of the presence of unit root in the variables in their levels form cannot be rejected indicating that the variables are not stationary. However, after taking their first difference, the null hypothesis of the unit root in each of the series are rejected at 1% levels of significance. Similarly, Table 2 presents PP test result for the variables at their levels and first difference. Interestingly, similar result is obtained as in the case of ADF test. All the variables are not stationary in their levels form, but became stationary after taking their first difference at 1 percent levels of significance as indicated by their respective probability values.

Table 2: PP Unit Root Test

PP Statistic		1	2	3	4	5	6
At Level	Intercept	-1.41	-0.02	-1.14	6.29	0.31	-0.79
		[0.56]	[0.94]	[0.68]	[1.00]	[0.97]	[0.80]
	Trend &	-2.36	-1.78	-3.06	0.71	-1.62	-3.37
	Intercept	[0.38]	[0.68]	[0.13]	[0.99]	[0.75]	[0.07]
	None	-0.48	0.94	-0.40	6.13	1.53	0.44
		[0.49]	[0.90]	[0.53]	[1.00]	[0.96]	[0.80]
	Remark	NS	NS	NS	NS	NS	NS
	Intercept	-6.13***	-4.34***	-8.86***	-4.81***	-4.21***	-8.82***
At First		[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Difference	Trend &	-6.09***	-4.40***	-8.68***	-11.84***	-4.26**	-3.43*
	Intercept	[0.00]	[0.00]	[0.00]	[0.00]	[0.01]	[0.077]
	None	-6.09***	-3.99***	-8.28***	-3.50***	-3.80***	-8.60***
		[0.00]	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
	Remark	Stationary	Stationary	Stationary	Stationary	Stationary	Stationary

*Note that: Values in parenthesis are the probability values while ***, ** and * denote level of significance at 1 percent, 5 percent and 1 percent respectively. NS = Non-stationary; 1 = lnCESCECO; 2 = lnRESCECO; 3 = lnCEAMTRA; 4 = lnREAMTRA; 5 = lnK; 6 = lnRGDP*
*Source: Authors' Computation*

Bounds Test for Co-integration
The first step deals with the estimation of conditional vector error correction model using ordinary least square to test for co-integrating relationship among the variables in the model. F-test for the joint significance of coefficients of lagged values of the variables are utilized for the bound testing. In this case, real GDP serves as the explained variables and it is regressed on the independent variables partly because the study is estimating a growth model.

In the bound test, the null hypothesis states that the coefficients of the lagged values of the variables are zero. Put differently, F-statistics tests the null hypothesis of no long run co-integration relationship between the variables.

In order to determine the optimal lag length of a model to be selected, the study applies Akaike Information Criteria (AIC). Figure 2 presents the best 20 models based on their AIC. The figure suggests the best model among them is the one with least AIC, which is the first model from the left in figure: ARDL(2, 1, 1, 0, 1, 1, 0).
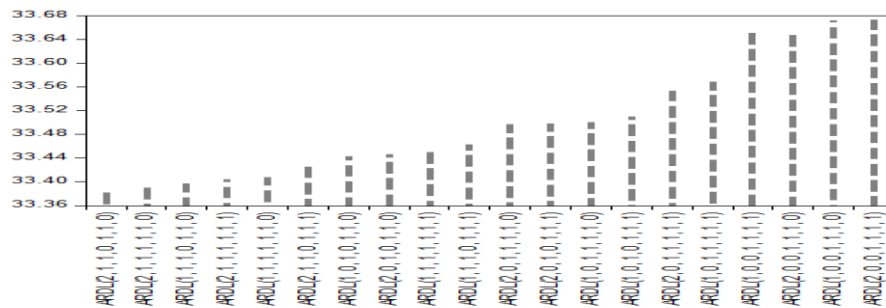
Source: Computed by author using E-views 10.0.
Figure. 2: Akaike Information Criteria (tap 20 models)

Table 3 reports the Bound test results wherein real GDP is normalized (that is, it is the dependent variable) in the ARDL model. The table indicates that F-statistic F_{RGDP} (RGDP│K, L, CESCECO, RESCECO, CEAMTRA, REAMTRA) is 23.61 and it is greater than the upper critical values at all levels of significance. This implies that there is a long run relationship between the variables.

Table 3: Result of Bounds Test for Co-integration

Dependent Variable → Real GDP		
Significant Levels	Critical Values	
	I(0) [Lower bound]	I(1) [Upper bound
10% Significance level	2.3340	3.5150*
5% significance level	2.7940	4.1480**
1% significance level	3.9760	5.6910***
F. Statistics	23.610	K= 6

*Note: *, ** and *** indicate that computed F-statistic falls above the upper bounds value at 10 percent, 5 percent and 1 percent levels of significance.*
Source: Authors' Computation

Long Run Relationship between Disaggregated Components of Capital andRecurrent Expenditures and Economic Growth
The result of the bound test in table 3 clearly shows that a long run co-integration relationship exist between the variables included in the growth model. Hence, equation 3 is estimated using ARDL (2, 1, 1, 0, 1, 1, 0) selected based on AIC. The result obtained is presented in table 4.

Table 4: Estimated Long Run Coefficient using ARDL Approach

Dependent Variable → Real GDP				
ARDL (2,1,1,0,1,1,0) selected based on AIC. 32 observations used for estimation from 1986-2016				
Variables	Coefficient	Standard error	T. statistic	P. values
C	- 0.8543	0.1917	1.901820-**	0.0010
lnK	0.1283	0.0432	1.272380***	0.0048
lnL	-0.0049	0.0019	-3.262737***	0.0049
lnCESCECO	0.5363	0.6371	2.699191**	0.0158
lnRESCECO	0.0080	0.2051	2.901820***	0.0000
lnCEAMTRA	-0,0066	0.0011	-2.109887**	0.0067
lnREAMTRA	-0.0694	1.0060	-1.802130**	0.0128

$$lnRGDP_t = -0.8543 + 0.1283lnK_t - 0.0049lnL_t + 0.5363lnCESCECO_t + 0.008lnRESCECO_t - 0.0066lnCEAMTRA_t - 0.0694lnREAMTRA_t + \mu_t$$

*Note: **and *** denote significance level at 1 percent and 5 percent levels of significance.*
Source: Authors' Computation

The parameter of capital stock is estimated to be 0.1283, which is positively significant at 1 percent. This means that 1 percent increase in capital stock increases real GDP by 0.13 percent. This is consistent with theoretical underpinnings that capital stock is essential to the development of a country's economy. The findings are also in tandem with previous studies such as Fambon (2013), Jibir, *et al.* (2018) and Barro (1990, 1991).

More so, the coefficient of labour force is found to be negatively significant in influencing real GDP in the long run. This finding contradicts the theoretical postulation by endogenous growth model developed by Barro (1990). It is also in contrast with previous studies such as Tkachenko and Mosiychuk (2014). On the other hand, Fambon (2013) state that labour force has not contributed positively in development of African societies partly due to unemployment, underemployment and poor skills and working conditions. Another reason for this, is the possibility of skill mismatch in the country. Capital expenditure on community, social and economic services is positively significant at 1 percent. Similarly, recurrent expenditure on community, social and economic services is also positively significant as it relates with real GDP in the long run. This finding is in line with the theoretical postulation that capital spending is necessary for sustained growth and development. Additionally, the coefficient of capital expenditure on administration and transfer is negatively significant at 5 percent. In the same line, recurrent expenditure on administration and transfer is also negatively correlated with real GDP. These upholds the proposition of endogenous growth theory that such expenditures are unproductive and have limited power in promoting growth and development. There are some studies that obtained similar evidence, like Aigbeyisi (2013), Barro (1990) and Muritala and Taiwo (2011).

Short Run Relationship between Disaggregated Components of Capital and Recurrent Expenditures and Economic Growth
In the presence of co-integrating relationship among the variables, we expect the model to have some dynamics in the short run. To understand the dynamics, error correction model (ECM) is estimated and the results are presented in Table 5. The coefficient of first lag error correction term (ECT-1) reflects the speed of convergence to long-run equilibrium in the model

Interestingly, coefficients of all the variables lnRESCECO maintain their signs as in the long-run equation. The coefficient of lnRESCECO changes from positive to negative. As stated earlier, the findings align with the theoretical postulations except for the coefficient of labour, which contradicts the theoretical underpinnings that labour force is essential in the process of growth and development. However, the finding is plausible and could be attributed to high level of unemployment, underemployment, skill mismatch and poor working condition which are bedevilling labour services in Nigeria.

Also, the coefficient of capital expenditure on community, social and economic services reveal a positive and significant correlation with real GDP. While recurrent expenditure on community, social and economic services show an insignificant negative nexus with real GDP. These findings confirm the theoretical postulations that capital expenditure is a necessary condition for the development of a country. Additionally, the coefficients of capital and recurrent expenditures on administration and transfers have depicted a significant negative correlation with real GDP at 1 percent levels of significance. This is not surprising because both endogenous and neo

classicalists proponents described such expenditures as unproductive. The findings are also in line with previous studies such as Jibir and Babayo (2015), Barro (1991).

Table 5: Estimated Short Run Error Correction Model Using ARDL Approach

Variable	Coefficient	Standard error	T Statistic	P – Value
ARDL (2,1,1,0,1,0) selected based on AIC 32 observations used for estimation, 1986-2016				
C	-0.3004	0.056212	-2.235959**	0.0400
ΔlnK	0.0038	0.0003	3.061471***	0.0000
ΔlnL	-0.0630	0.0348	-4.880398***	0.0000
ΔlnCESCECO	0.0630	0.0438	2.09460**	0.0070
ΔlnRESCECO	-0.0028	0.0004	-1.604278*	0.1282
ΔlnCEAMTRA	-0.0038	0.0005	-2.674229***	0.0021
ΔlnREAMTRA	-0.0041	0.0292	-3.24147***	0.0035
ECT(-1)	-0.602204	0.03654	-5.47847***	0.0000
R-squared	0.9294		Mean Dependent var	23730
Adjusted R-squared	0.9141		S.E Dependent var	10507
S.E of Regression	30782		Akaike info criterion	32.89
Sum square resid	2.18		Schwarz criterion	33.18
Log Likelihood	-471.04		Hannan-Quinn criterion	32.98
Durbin-Watson stat	1.5784		F-stat	118.27 [0.0000]***

$$lnRGDP_t = -0.3004 + 0.0038\Delta lnK_t - 0.063\Delta lnL_t + 0.063\Delta lnCESCECO_t$$
$$- 0.0028\Delta lnRESCECO_t - 0.0038\Delta lnCEAMTRA_t - 0.0041\Delta lnREAMTRA_t$$
$$- 0.6022ECT_{t-1}$$

*Note: **and *** denote significance level at 1 percent and 5 percent levels of significance.*
Source: Authors' Computation

Furthermore, the estimated error correction coefficient is negatively significant at 1 percent level, implying that the convergence process from the short run deviation is very fast as about 60.22 percent of the distortion is annually corrected. This means that the model has an in-built stabilizer. The result in Table 5 also depicts that the model passes the first-order serial correlation test as the Durbin-Watson statistic of 1.57 suggests no evidence of serial correlation in the residuals. F-statistics indicates that explanatory variables are jointly significant at 1 percent, and that they have high explanatory power as depicted by adjusted-R^2 of 0.9141, suggesting that 91.41 of variation in the dependent variables are explained by the independent variables.

Diagnostic Tests
The study applied numerous dialogistic tests to the ARDL model to ensure the robustness and reliability of the findings. Table 6 presents the results for the various diagnostic tests conducted.

The findings depict no evidence of serial correlation, misspecification and heteroscedasticity in the estimated growth model. In addition to this, normality test reveals that the residuals are normally distributed.

Table 6: Model Diagnostic Tests

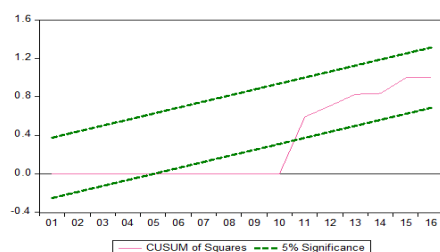| Diagnostics test technique	Statistic	Probabilities
Breusch-Godfrey Serial correlation LM test	0.7180	0.5048
Heteroscedasticity test	1.6826	0.1638
Jarque-Bera Normality test	1.0974**	0.0076
Ramsey RESET test	0.8967	0.2314

Source: Authors' Computation
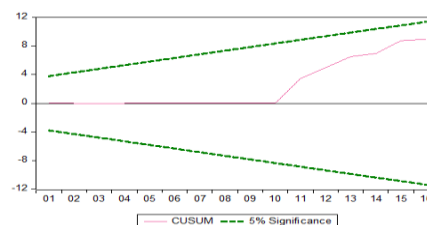
Fig. 3: Plot of Cummulative Sum of Recurs. Res.   Fig. 4: Plot of CUSSUM Sqr Recurs. Res
Source: Authors' Computation

Similarly, Figures 3 and 4 present respectively results of CUSSUM and CUSSUMQ tests. The CUSSUM test result proves that the data is stable as the critical line lies within the 5 percent level of significance. On the other hand, the CUSSUM Square Recursive Residuals reveals that the data is not fully stable as the critical line lies outside the 5 percent level of significance. Nonetheless, since the CUSSUM test has confirmed that the parameters are stable, it is therefore sufficient in making inferences and concluding that the model is stable.

5. Conclusion and Recommendations

The findings of the study are robust and have shed more light on the relationship between public expenditure components and economic growth, it has also showed the results of the ARDL model for short and long run of the growth models. Findings from the study clearly reveal that productive expenditure has contributed immensely in the economic growth and development of Nigeria during the study period. Again, recurrent expenditure to the long-run growth model depicts a significant negative correlation with economic growth. This has confirmed presumption of the endogenous growth model developed by Barro (1990; 1991) which considers recurrent expenditure as unproductive component of public expenditure. Interestingly, the disaggregation of recurrent expenditure into its various components in the short-run growth model has further confirmed the result of the long-run growth model. Recurrent expenditure on community, social and economic services reveals a positive and significant relation with economic growth.

The findings reveal that the control variable (capital stock) represented by gross fixed capital formation has a positive and significant impact on economic growth, which aligns with theoretical postulations. Both the neo-classical and endogenous growth models emphasize the role of capital stock in the process of growth and development. In fact, the differences in the level of development among countries are linked to the efficiency of capital stock. Thus, this shows that stock of capital over the years has significantly contributed to the overall growth and development of Nigeria. Therefore, a developing economy like Nigeria, is expected to benefit from its capital formation particularly in laying a solid foundation and providing a workable business ground for individuals, firms and government.

Also, the results of the ARDL show that labour force, as another control variable, in the growth model unexpectedly depicts a significant negative nexus with economic growth across long and short runs. The rising size of Nigerian labour force is expected to be an opportunity to drive economic expansion and increase economic growth. However, the results under the two growth models indicate that labour force has a negative association with economic growth in contrast with theoretical postulations. The policy implication is that expansion in Nigeria labour force pose a serious threat to national development. As explained earlier, that can be as a result of high level of unemployment, skill mismatch and underemployment of labour resurfacing in Nigeria. This has various economic implications worsened by labour inefficiency due to poor condition of services. Besides, the poor participation of female labour in Nigeria as a result of religious and cultural beliefs may have also contributed to the negative association between labour force and economic performance.

Therefore, any successful attempt at improving capital expenditure through monitoring and implementation of projects would accelerate the level of infrastructural development. This would set a ground for the development-oriented structural transformation of the Nigeria's economy from principally agrarian economy to a growing economy with expanding industrial and services sectors, capable of absorbing the large and ever growing labour force. The reform would reduce unemployment and underemployment and in turn improve societal wellbeing.

A closer look at the pattern of public expenditure in Nigeria reveals that it is largely protective instead of productive and is downgraded to a passive role as a fiscal policy instrument. Hence, for fiscal policy to be effective in terms of influencing the long-run economic performance, it should be tailored essentially towards productive physical and human capital development projects. The resources should be efficiently allocated within the economy given their potentials to finance growth-enhancing projects such as infrastructure, research and development, education and health.

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