



# THE DEVELOPMENTAL IMPLICATIONS OF NIGERIA'S PUBLIC SPENDING: AN ARDL ANALYSIS

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## Abstract

In the context of a developmental state, fiscal policy is still widely recognized as a potent tool for enhancing growth, redistributing income, and reducing poverty in an economy. Whereas the growth and development of the Nigerian economy have not been stable over the years as a result, the country's economy has witnessed so many shocks and disturbances both internally and externally over the decades. There exists a consensus in the literature that an adequate and effective macroeconomic policy is critical to any successful development process aimed at achieving high employment, sustainable economic growth, and price stability. Is the Nigerian government a developmental state? In an attempt to answer this question, this study examined the short and long-run impact of public expenditure on economic development in Nigeria from 1980 to 2020. Specifically, it seeks to determine the nature and direction of causality between government spending and economic development. The study employs the pairwise Granger causality technique and Autoregressive distributed lagged (ARDL) model to evaluate the empirical evidence of the impact of public expenditure on economic development, measured by poverty level in Nigeria. After testing for Granger causality, the result reveals that there is a bidirectional relationship between government spending and economic development in Nigeria. Also, the analysis showed that there is a long-run relationship between public expenditure and economic development in Nigeria. Based on these findings, the study concludes that the Federal Government should ensure increased interventions in key sectors of the economy concerning government spending knowing that it affects the level of economic development. Therefore, this study recommends that to achieve sustainable economic development in Nigeria, Government expenditure should be increased in the health, education, and agricultural sectors in the economy.

**Keywords: Developmental state, Government Expenditure, Bound Test, Causality, Economic Development**

## 1.0 INTRODUCTION

Nigeria is bestowed with rich human and natural resources, but it is particularly disturbing that despite these abundant signs of wealth in economic potential, Nigeria is still rated as one of the poorest countries of the world, placed at 161 positions out of 189 countries on HDI ranking (UNDP 2020). This issue in Nigeria is also associated with poverty, income inequality, low income, unstable growth and unemployment, economic instability, and political and poor investment. For instance, according to the World Poverty Clock, more than 643 million people globally live in extreme poverty, and over two-thirds of these people are found in Africa (Adebayo, 2018). Also, the 2018 ranking captured by the World Poverty Clock shows that Nigeria with 86.9 million people living in abject poverty is among the top 10 African countries with the largest number of people living in extreme poverty, others include Zambia (9.5 million), South Sudan (11.4 million), South Africa (13.8 million), Uganda (14.2 million), Kenya (14.7 million), Mozambique (17.8 million), Tanzania (19.9 million), Ethiopia (23.9 million), Democratic Republic of Congo (60.9 million) (Kazeem, 2018 as cited in Omodero, 2019). In January 2021, the figure increased to 490 million people living in extreme poverty in Africa, indicating 36% of the African population. In Nigeria, the number increased to about 91 million people living in extreme poverty indicating 43% of the Nigerian population.

In addressing these issues, states as a concept have returned to the center of international policy debate. As the Commission for Africa, acknowledged that weaknesses in the ways states function form a major barrier to the development of poor countries. A developmental state is characterized by having strong state intervention which can direct and support economic development through building a strong public policy, creating an investor-friendly environment, supporting small business development, using state-owned resources effectively, and driving strategic investment initiatives. It is the ambition of every independent nation to

attain some degree of development over a certain period but of course to achieve such, planning through deliberate formulation and diligent implementation of development policies is the wheel to success, since development cannot occur naturally or by accident. In a developmental context, the use of fiscal policy is very paramount in every economy, mostly in developing countries, as a major tool for stabilization and for development to be erratic. Government expenditure plays a vital role in economic growth and poverty reduction throughout the world. According to the Keynesian approach, public spending may increase the aggregate demand which further stimulates economic growth and employment. Therefore the size of government expenditures and their effect on economic development has been an issue of continued interest for decades.

There have been studies on poverty and income inequality in Nigeria but the results have not been unanimous. In Nigeria, the scale of economic inequality has reached an extreme level, despite the numerous government poverty alleviation programs initiated since 1980 till now. But the objective of the programs was among other things to reduce poverty and inequality specifically. This study seeks to examine the developmental nature of government expenditure in Nigeria. Specifically, it is aim at analyzing government expenditure on different sectors of the economy and how they affect economic development.

## 2.0 Literature Review

### 2.1 Theoretical Issues

Adam Smith wrote in The 'Wealth of Nations that the government should restrict its activities to;

1. Defense against foreign aggression.
2. Maintenance of internal peace and order.
3. Public development work.

All other functions besides these were considered beyond the scope of the state & expenditure on them was treated as unjust & wasteful. But there had been a spectacular expansion in the functions of the state and this resulted in a phenomenal increase in public expenditure for this we shall take a look at the contribution of scholars regards to this.

#### 2.1.1 Adolph Wagner's Law of Increasing State Activity

Adolph Wagner, the German economist made an in-depth study relating to the rise in government expenditure in the late 19<sup>th</sup> century. Based on his study, he propounded a law called "The Law of Increasing State Activity". Wagner's law states that "as the economy develops over time, the activities and functions of the government increase" (Udo & Charles 2014; Udo, Charles & Ogar 2016).

According to Adolph Wagner, "Comprehensive comparisons of different countries and different times show that among progressive peoples (societies), with which alone we are concerned; an increase regularly takes place in the activity of both the central government and local governments constantly undertake new functions, while they perform both old and new functions more efficiently and more completely. In this way, economic needs of the people to an increasing extent and in a more satisfactory fashion are satisfied by the central and local Governments."

Wagner's Statement Indicates the Following Points

1. In progressive societies, the activities of the central and local governments increase regularly.
2. The increase in government activities is both extensive and intensive.
3. The governments undertake new functions in the interest of society.
4. The old and the new functions are performed more efficiently and completely than before.
5. The purpose of the government activities is to meet the economic needs of the people.
6. The expansion and intensification of government functions and activities lead to an increase in public expenditure.
7. Though Wagner studied the economic growth of Germany, it applies to other countries too both developed and developing.

The principal criticisms of Wagner's law have concerned his view of history and the relationship between the state and its citizens. Peacock and Wiseman also queried whether Wagner's ideas could be applied to all societies at all times and suggested that the time pattern of actual public expenditure growth did not fit well with Wagner's law.

#### The Peacock-Wiseman Hypothesis

Peacock and Wiseman conducted a new study based on Wagner's Law. They studied public expenditure from 1891 to 1955 in the U.K. They found out that Wagner's Law is still valid.

Peacock and Wiseman further stated that:-

1. "The rise in public expenditure greatly depends on revenue collection. Over the years, economic development results in substantial revenue to the governments, this enabled to increase public expenditure".
2. There exists a big gap between the expectations of the people about public expenditure and the tolerance level of taxation. Therefore, governments cannot ignore the demands made by people regarding various services, especially, when the revenue collection is increasing at a constant rate of taxation.

3. They further stated that during times of war, the government further increases the tax rates, and enlarges the tax structure to generate more funds to meet the increase in defense expenditure. After the war, the new tax rates and tax structures may remain the same, as people get used to them. Therefore, the increase in revenue results in a rise in government expenditure.

Wagner's law and Peacock-Wiseman's hypothesis emphasize the fact that public expenditure tends to increase over time.

### **Musgrave and Rostow's Development Model**

The economist, Musgrave, and the economic historian, Rostow, (separately) suggested that the growth of public expenditure might be related to the pattern of economic growth and development in societies. Three stages in the development process could be distinguished:

- (a) The early development stage where considerable expenditure is required on education and on the infrastructure of the economy (also known as social overhead capital) and where private saving is inadequate to finance this necessary expenditure (in this stage, government expenditure must thus be a high proportion of total output);
- (b) The phase of rapid growth in which there are large increases in private savings and public investment falls proportionately; and
- (c) High-income societies with increased demand for private goods which need complementary public investment (e.g. the motor car and urbanization).

The increasing need in high-income societies for skilled labour leads education to become increasingly an investment good for society as a whole. Increased population movements lead to the development of urban slums. Such factors and others lead once again to an increase in public expenditure to total output.

These views are interesting about theories of growth and development but are rather too general to provide much of a guide to recent experience in developed industrial countries.

### **Critical-Limit Hypothesis**

Another hypothesis known as the critical-limit hypothesis, concerned with the tolerance level of taxation, was enunciated by the British economist Colin Clark immediately after World War II. Analysis of the empirical data of several Western countries for the inter-war period results in the critical-limit hypothesis that when the government sector taxes and other receipts exceed 25 percent of aggregate economic activities, inflation necessarily arises, even when the budget is balanced. Clark lays down that

1. When the government tax system extricates increasing proportions of additional income from taxpayers, whose incentives are harmed and whose productivity falls.
2. People become less resistant to inflationary methods of government financing. While the aggregate demand expands as a result of inflationary financing techniques, aggregate supply falls due to the loss of incentives and, hence, inflation results.

As the hypothesis is based upon institutional factors like the tolerance level of taxation, it resembles the displacement effect. In quite other respects, the two hypotheses are quite different. Whereas this hypothesis has received very little support from academic circles, it has received popular support from business circles. Recent decades have, however, proved that many countries have crossed the 25 percent limit without many inflationary tendencies.

### **2.1.2 Keynesian View of Government Intervention**

The central tenet of the Keynes school of thought is that government intervention can increase economic activities and stabilize the economy. This was evident during the Great Depression of the 1930s when the existing economic theory was incapable of either giving the reason for the economic depression that the world economy was experiencing or offering a proper government policy solution to salvage the economic downturn bringing economic recovery as well as employment in the economy. Amid this situation, Keynes, a great British economist, propounded a theory that overturned the belief of automatic full employment expected by the free market economy and caused a revolution in economic thinking. The main idea of Keynes's theory is the contention that aggregate demand (given by the sum of spending by households, firms, and the government) is the most important driving force in an economy. Keynes further asserted that free markets have no self-balancing mechanisms that lead to full employment. Keynesian economists give a good reason for government intervention through increased public spending that is aimed at achieving full employment and price stability in the economy (Antai, Aniefiok & Charles 2016).

Keynes argued that insufficient aggregate demand could lead to protracted periods of high unemployment. An economy's output of goods and services is the sum of four components: consumption, investment, government purchases, and net exports (the difference between what a country sells to and buys from foreign countries). Any increase in demand has to come from one of these four components. But during a recession, strong forces often dampen demand as spending goes down. For instance, when there is an economic recession uncertainty often erodes consumer confidence, causing them to reduce their spending, especially on discretionary expenditures. This decline in spending by consumers can result in less investment spending by firms, as firms respond to weakened demand for their products. This puts the task of increasing output on the shoulders of the government. According to Keynesian economics, state intervention is necessary to moderate the booms and busts in economic activity, otherwise known as the business cycle (Akpan, Udo, Umoh, & Okon 2018).

## **2.2 Empirical Literature**

Nurudeen & Usman (2010) empirically assessed the impact of disaggregated government spending on economic growth in the case of Nigeria during the period from 1979 to 2007. Government expenditure was disaggregated into capital expenditure, recurrent expenditure, expenditure on education, expenditure on transport and communication, and expenditure on health. Using the co-integration and error correction methodology, the results of the study revealed that government expenditure on transport and communication, and health, leads to an increase in economic growth in Nigeria.

Wahab (2011) used a worldwide sample in examining the impact of both aggregated and disaggregated government spending on economic growth using two samples – one sample for aggregated government spending in 97 developing and developed countries during the 1960–2004 periods and the other sample for disaggregated government spending in 32 countries using the 1980–2000 data. Based on the symmetric and asymmetric model specifications, the study revealed that aggregate spending by a government has both a positive impact on economic growth and positive output growth effects. From the disaggregated sample, the study further showed that government investment spending has positive output growth effects.

Shahid et al. (2013) examined the impact of government expenditure on economic growth in Pakistan during the period from 1972 to 2009. They further split government expenditure into development expenditure and current expenditure components. Using the autoregressive distributed lag (ARDL) model, the study revealed that in Pakistan, development expenditure positively affects economic growth.

Attari & Javed (2013) empirically explored the relationship between government expenditure and economic growth in Pakistan using time series data stretching from 1980 to 2010. The study further splits government expenditure into two categories – current expenditure and development expenditure. Based on time-series econometrics tools, the results of the study revealed that both types of government expenditure have a positive impact on economic growth in the study country, both in the short run and in the long run.

Egbetunde & Fasanya (2013) empirically analyzed the impact of public expenditure on economic growth in Nigeria based on annual time series data from 1970 to 2010. Government spending was further disaggregated into two categories, capital, and recurrent spending. Using the ARDL estimating techniques, the study showed that in Nigeria, both recurrent and capital expenditures have a positive impact on economic growth.

Alshahrani & Alsadiq (2014) investigated the long- and short-run impact of government expenditure on economic growth in the economy of Saudi Arabia during 1969–2010. The study further divided government expenditure into various types. Using different econometric techniques, the findings of the study indicated that healthcare expenditure and expenditure on domestic investment have a positive impact on economic growth. The same findings also confirmed that in Saudi Arabia, housing sector expenditure has the same effect on economic growth, however, in the short run.

Udo & Effiong (2014) in their study to examine the relationship between government expenditure and economic growth in Nigeria, employs the Granger causality and ordinary least square (OLS) technique to evaluate the empirical evidence of the relationship between fiscal policy and economic growth in Nigeria by using an econometric technique through multiple regression models that was derived from the Solow growth model. After testing for Granger causality, the result reveals that there is a bidirectional relationship between government spending and economic growth in Nigeria. Also, the analysis showed that government expenditure in our Nigerian economy had a direct effect on economic growth and recommended that there is a need for appropriate policies concerning government spending knowing that it affects the level of growth. To achieve sustainable economic growth, Government expenditure should be increased in the economy.

Al-Fawwaz (2016) examined the impact of government expenditure – and its disaggregated components – on economic growth in Jordan during a period from 1980 to 2013. Using the multiple linear regression model and the OLS model, the results confirmed the existence of a positive relationship between government expenditure and economic growth in the study country. Thus, both total government expenditure and current government expenditure were found to have a positive impact on economic growth. This result lent support to the Keynesian view that places importance on government expenditure in propelling economic growth.

Guandong and Muturi (2016) examined the relationship and dynamic interactions between government expenditure and economic growth in South Sudan from 2006 to 2014. However, government expenditure was further divided into various components. Using the regression model for panel data, including a random effect to analyze the data, the findings showed that public expenditure on infrastructure, the productive sector, and security are positive determinants of economic growth in the study country.

Ashgari & Heidari (2016) revisited the government spending-economic growth nexus as they empirically examined the impact of government size on economic growth. The study was based on a sample of selected Organisation for Economic Cooperation and Development – Nuclear Energy Agency (OECD-NEA) countries based on data stretching from 1990 to 2011. Using the Panel Smooth Transition Regression (PSTR) model in the form of a Cobb-Douglas equation function, the results of the study rejected the linearity hypothesis.

Kimaro et al. (2017) empirically assessed the impact and efficiency of government expenditure on economic growth in 25 low-income SSA countries, covering the period from 2002 to 2015. Using the GMM, the results of the study showed that government expenditure and economic growth were positively related in the study countries.

Leshoro (2017) also put government spending and economic growth to an empirical test in the case of South Africa using annual data covering the period from 1976 to 2015. Government spending was further disaggregated into various components – government investment spending and government consumption spending. Using the autoregressive distributed lag (ARDL) estimation procedure, the results of the study showed that government spending has a positive impact on economic growth in the

study country, irrespective of the government expenditure component under consideration – investment or consumption expenditure. These results were found to hold irrespective of whether the estimation was in the long run or the short run.

Lupu et al. (2018), in their recent study, put the impact of disaggregated public expenditure on economic growth to the test, in the case of 10 selected Central and Eastern European countries using data stretching from 1995 to 2015. Using the ARDL approach, the results of the study revealed that public expenditures on education and health care have a positive impact on economic growth in the study countries.

Okoye et al. (2019) examined the relationship between government expenditure both aggregated and disaggregated – and economic growth to determine the extent to which output growth in Nigeria is affected by government spending, during the – period from 1981–2017. They found that in Nigeria, capital expenditure has a positive impact on economic growth.

Ahuja and Pandit (2020) in their study, Regardless of theoretical grounds that presumed a positive relationship between government spending and economic growth, the extant research on this nexus is inclusive. Their study re-examined the relationship between public expenditure and economic growth using more numerous panel data set covering 59 countries from 1990 to 2019. Their empirical results confirmed a unidirectional causality between economic growth and government expenditure where the causation runs from public spending to GDP growth. The results at large support the Keynesian framework that asserts the importance of government expenditure in stimulating economic growth. Further, the analysis reveals that after considering all the control variables such as trade accessibility, investment, and inflation public spending positively affects economic growth. Concerning control variables, it was found that investment has a significant and positive bearing on economic growth. Evidence from the regression estimates further displays that trade openness encourages evolution in developing countries. However, population growth and unemployment have a detrimental effect on economic growth.

The possible impact of government spending on economic growth has been varied. Some studies have found the impact to be positive (Yasin, 2000; Attari, Javed, 2013; Kimaro, Keong, Sea, 2017) while others have found a negative impact (Devarajan, Swaroop, Zou, 1996; Nurudeen, Usman, 2010; Sáez Álvarez-García, Rodríguez, 2017). Some studies concluded that government spending has no significant impact on economic growth (see Schaltegger, Torgler, 2006; Hasnul, 2015; Anwana & Akpan 2017). Due to inconclusive the empirical studies regarding this issue and the fact that most of the studies centered on government spending and growth rather than development, this study seeks to fill this gap for Nigerian study.

### 3.0 Research Method

This section presents the main method of analysis employed for this study including the estimated models and analytical tools deployed. Section 3.1 presents the model specified for the study derived from theory.

#### 3.1 Model Specification

Based on the Keynesian theory of stimulating aggregate demand by public expenditure, the model that this study used to examine the empirical evidence of the developmental nature of Nigerian public spending is drawn from the aggregate demand function in a closed economy and is given as;

$$Y = C + I + G \quad 3.1$$

Where; Y is aggregate demand, C is individual (private) consumption, I is the investment from the cooperate bodies (firms) and G is government expenditure.

In the context of this study, we centered on G and held other components of the aggregated demand to be constant. Here we removed the external sector of the economy because the study wants to analyze the decisions and activities (ie decisions on spending) of the Nigerian government as a developmental state in isolation of the influence of the external forces (external sector). To this extent, the aggregate demand model is modified to be;

$$Y = G \quad 3.2$$

Here, G is disaggregated into different sectors of the economy as;

$$Y = f(\text{GexA}, \text{GexEC}, \text{GexE}, \text{GexH}, \text{GexRC}, \text{GexTC}, \text{GexAD}) \quad 3.3$$

Where;

GexA = Government expenditure on the Agricultural sector

GexEc = Government expenditure on other Economic sectors

GexE = Government expenditure on the Education sector

GexH = Government expenditure on the Health sector

GexRc = Government expenditure of infrastructure such as road and construction

GexTC = Government expenditure on transport and communication sector

GexAD = Government expenditure on Administration

In addition, Y which is aggregate demand is seen in this study as the ability or capacity of the citizenry to demand. The ability of each of the Nigerian citizens to demand goods and services in the economy can be captured by the level of poverty in the economy.

Therefore, the aggregates demand function is further modified to become;

$$\text{POV} = f(\text{GexA}, \text{GexEC}, \text{GexE}, \text{GexH}, \text{GexRC}, \text{GexTC}, \text{GexAD}) \quad 3.4$$

Where POV = poverty level in Nigeria

Equation 3.4 in its estimated form is seen as;

$$POV = b_0 + b_1GexA + b_2GexEC + b_3GexE + b_4GexH + b_5GexRC + b_6GexTC + b_7GexAD$$

### 3.2 Data and Source

This research study relies on secondary sources of data. As such, annual time series data for this study will be sourced from the World Development Indicators of the World Bank and the Central Bank of Nigeria (CBN) statistical Bulletin for various years. The study uses data for the period of forty (40) years from 1980 to 2020.

### 3.3 Estimation Procedures and Techniques

The method of data analysis employed in this study is both descriptive and analytical. The descriptive tools include graphs, tables, and percentages. The econometric analysis package (E-views, Version 10 2010) will be used for the analysis of all data sets.

The analytical tools used in this study are pairwise Granger causality test, correlation matrix, and autoregressive distributed lag model (ARDL) otherwise known as bound test.

The Granger causality test is a statistical hypothesis test to check if the action or performance of one variable has an effect or causes the existence of another. However, this analysis is only streamlined to the most important variables under consideration. The Pearson correlation technique will also be used to determine the strength of the relationship between fiscal policy indicators and economic development in Nigeria. In statistics, the Pearson product-moment correlation coefficient (or Pearson correlation coefficient) is a measure of the strength of a linear relationship between two variables. A Pearson product-moment correlation attempts to draw a line of best fit through the data of two variables and it indicates how far away all these data points are to this line of best fit (i.e., how well the data points fit this new model/line of best fit). The Pearson correlation coefficient can take a range of values from +1 to -1. A value of 0 indicates that there is no relationship between the two variables. A value of a coefficient greater than 0 indicates a positive relationship, while a value less than 0 indicates a negative relationship.

The use of the Auto-Regressive Distributive Lagged (ARDL) Model developed by Pesaran and Shin (1999) and further developed by Pesaran et al, (2001) to allow for causality and dynamics as well as testing for both short-run and long-run relationships among variables. The ARDL technique is considered more appropriate compared to other traditional approaches because it can be implemented regardless of whether the variables are integrated of order (1) or (0) and can be applied to small finite samples. This study specifically, is used to check the lagged effects or gestation period of relevant government sectoral expenditure on economic development in Nigeria.

The outline of the application of ARDL techniques for co-integration was developed by Pesaran et al. (2001) to establish the long-run relationship between fiscal policy instruments and economic development. In the first step of the ARDL analysis, we test the presence of long-run relationships. The number of lags used in the estimated model is selected based on Akaike Information Criterion (AIC). Thereafter insignificant variables will be deleted from the model when justified by AIC and adjusted R<sup>2</sup> moves in the right direction (Akpan, B & Anwana, E. 2017). Second, the long-run relationship was estimated, followed by the short-run coefficients using the error correction representation of the ARDL specification below to establish the speed of adjustment to equilibrium.

$$Z_t = \mu_0 + \delta_t + \Sigma\phi Z_{t-1} + \varepsilon_t \quad t = 1, 2, \dots, T \quad \text{Equation (3.5)}$$

Where  $\mu_0$  is the (k+1) vector of intercepts and denotes a (k+1) vector of trend coefficients.

The Vector Error Correction Model (VECM) for equation (3.5) is given as:

$$\Delta Z_t = \mu_0 + \delta_t + \lambda Z_{t-1} + \Sigma Y_i \Delta Z_{t-1} + \varepsilon_t \quad \text{Equation (3.6)}$$

Where

$\lambda$  and  $Y$  are vector matrices that contain the long-run multipliers and short-run dynamics coefficients of the VECM respectively.

$z_t$  is a vector of  $x_t$  and  $y_t$  variables respectively,

where  $z_t$  is the dependent variable defined as economic development which is proxy by poverty level in the country and

$x_t = [GexEC, GexA, GexAd, GexE, GexTc, GexRc, GexH]$  is a vector matrix of the set of explanatory variables.

As a requirement,  $y_t$  must be an I(1) variable while  $x_t$  explanatory variables can either be I(0) and I(1).  $\varepsilon_t$  is a stochastic error term.

Following the assumptions made by Pesaran et al (2001) in case II, that is, unrestricted intercepts and no trends, the preferred Unrestricted Error Correction Model (UECM) is derived as:

$$\Delta Z_t = \mu_0 + \lambda Z_{t-1} + \Sigma Y_i \Delta Z_{t-1} + \varepsilon_t \quad \text{Equation (3.7)}$$

Decomposing into  $x_t$  and  $y_t$ , the reduced form of Eq(3.14) is formulated as:

$$\Delta y_t = C_y o y_{t-1} + \beta_{xx} X_{t-1} + \Sigma Y_i \Delta y_{t-1} + \Sigma Y_i \Delta x_{t-1} + \varepsilon_t \quad \text{Equation (3.8)}$$

The study also employed the following diagnostic tests:

1. **Unit root tests of stationarity:** In statistics, a unit root test tests whether a time series variable is non-stationary using an autoregressive model. A well-known test that is valid in large samples is the augmented Dickey–Fuller test. The optimal finite-sample tests for a unit root in autoregressive models were developed by Denis Sargan and Alok Bhargava. Another test is the Phillips–Perron test. These tests use the existence of a unit root as the null hypothesis. The stationarity status of the variables in this study is established by considering the order of integration of each variable in the model using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) classes of unit root tests.

## 2. Lagged Length Criteria

The lag length is how many terms back down the AR process you want to test for serial correlation. Is checking the prior one alone enough, or do you need to check in groups of 3, 4, or more? The rule-of-thumb is to select the criterion with the lowest value which again is the AIC at 26.90693 this is because the lower the value, the better the model. We can conclude that the optimal lag length for the model is 2 and the best criterion to adopt for the model is AIC (Akpan, B., Udo, A. B., Eduno, E. & Anwana, E. 2018).

## 4.0 EMPIRICAL RESULTS

### 4.1 Descriptive Analysis

Table 4.1: Descriptive statistics of the Macroeconomics Variables

	<b>GEXE</b>	<b>GEXA</b>	<b>GEXAD</b>	<b>GEXH</b>	<b>GEXTC</b>	<b>GEXRC</b>	<b>GEXEC</b>	<b>POV</b>
Mean	120.2302	17.48817	446.5282	71.74740	14.71145	39.83510	49.62796	136561.6
Median	41.74662	6.700162	162.6655	15.92843	5.538092	6.418329	3.217980	38237.32
Maximum	593.3328	70.27454	2105.197	388.3671	90.02793	195.9000	435.0385	583514.6
Minimum	0.155810	0.012770	0.595130	0.015320	0.027300	0.046030	0.000000	518.1896
Std. Dev.	161.8732	21.48876	566.7119	102.5015	20.01166	56.90433	85.56117	182702.1
Skewness	1.288118	0.990284	1.121824	1.421646	1.883761	1.321563	2.697953	1.201333
Kurtosis	3.491141	2.697085	3.206645	3.993590	6.907942	3.618462	11.64513	3.020787
Jarque-Bera	11.46368	6.690681	8.461103	15.11922	49.11038	12.28102	173.0900	9.622055
Probability	0.003241	0.035248	0.014544	0.000521	0.000000	0.002154	0.000000	0.008139
Sum	4809.210	699.5269	17861.13	2869.896	588.4580	1593.404	1985.118	5462464.
Sum Sq. Dev.	1021914.	18008.91	12525332	409755.9	15618.19	126286.0	285507.8	1.30E+12
Observations	40	40	40	40	40	40	40	40

Source: computed by the Authors

Table 4.1 represents the descriptive statistic of the macroeconomic indicators used in the estimated model. From the table, we discovered that the average spending on education for the period under review was 120.23 billion naira while that of the Agricultural sector was only 17.49 billion naira for the 40 years under study. This is very small compared to government expenditure on other sectors of the economy. This indicates that the Nigerian government spends less in this sector, hence the reason for the decline in the contribution of this sector to the Gross domestic product in our country. In the case of expenditure on administration, the table shows that it has the highest average spending in 40 years. This indicates that the cost of governance in Nigeria is very high as the state spends more for carrying out governance in the country with an average of 446.5 billion over the years. Also, the agricultural sector again receives the lowest attention in terms of the maximum level of government expenditure to different sectors in the country. This sector had only 70 billion nairas as its maximum allocation ever since the 1980 to 2019 fiscal years. This is comparatively small. The result reveals that expenditure in the health and education sector did not receive much attention as it supposes that these sectors deal with human development. This gives the reason why Nigeria is still very backward in the human development ranking. Also, this exposes that the Nigerian government gives top priority to governance than to developmental activities given that the administration has the highest public expenditure all through the years under review. The transport and communication sector is another sector that receives low attention according to the result in Table 4.1 and this reveals the poor transport network in the country as compared to the developed economies. From the average spending also, the expenditure on infrastructure, captured here by expenditure on road and construction has low patronage with an average spending of only 39.8 billion naira for as many as 40 years under review. Again, this revealed the poor and dilapidated nation of our Nigerian roads all around the country.

In addition to the descriptive statistic result in Table 4.1, the study further computed the public expenditure to different sectors of the economy in terms of their percentage to total expenditure. This was only computed for the last decade (10 years). Table 4.2 presents the result;

**Table 4.2: Government Sectoral Expenditure in Percentage to Total Expenditure**

YEARS	EDUCATION	HEALTH	AGRICULTURE	ADMIN
2010	5.47%	3.2%	0.9%	35.94%
2011	10.13%	6.9%	1.2%	38.1%
2012	9.86%	5.95%	1.00%	34.87%
2013	10.15%	5.59%	1.23%	34.58%
2014	10.54%	5.72%	1.07%	28.97%
2015	10.28%	6.73%	1.08%	32.07%
2016	7.92	0.05%	0.87%	30.67%
2017	7.4%	5.13%	1.05	27.71%
2018	7.04%	5.22%	0.95%	27.91%
2019	8.48%	5.55%	1.00%	30.09%

*Source: computed by the authors based on CBN statistical bulletin various years*

The result in Table 4.2 indicates that using the health sector as an example, public expenditure on the health sector is very poor in the Nigerian economy. For instance, in 2016 only 0.05 percent of the total expenditure in that fiscal year was spent on the health sector. This is very pathetic compare to the one spent on administration. This reveals why there is a high under-5 and infant mortality rate in Nigeria since low attention is given to our health sector. The agricultural sector has been abandoned in the country according to the statistics and this explains the reason for the high rate of unemployment in the Nigerian economy as the agricultural sector employs a greater number of the Nigerian population. The education sector had as low as 5.47 percent of total expenditure in 2010, increased to 10.54 percent in 2014 then drop to 8.48 percent in 2019.

Another descriptive analysis is the graph of selected macroeconomic indicators in the estimated model. The result of this graph is shown in Figure 1. From the graph, the pattern of slope in the axis reveals the fluctuations in government expenditure in different sectors. Again, it reveals that the sector that received the lowest attention in terms of government expenditure was the agricultural sector, followed by the health and education sectors.

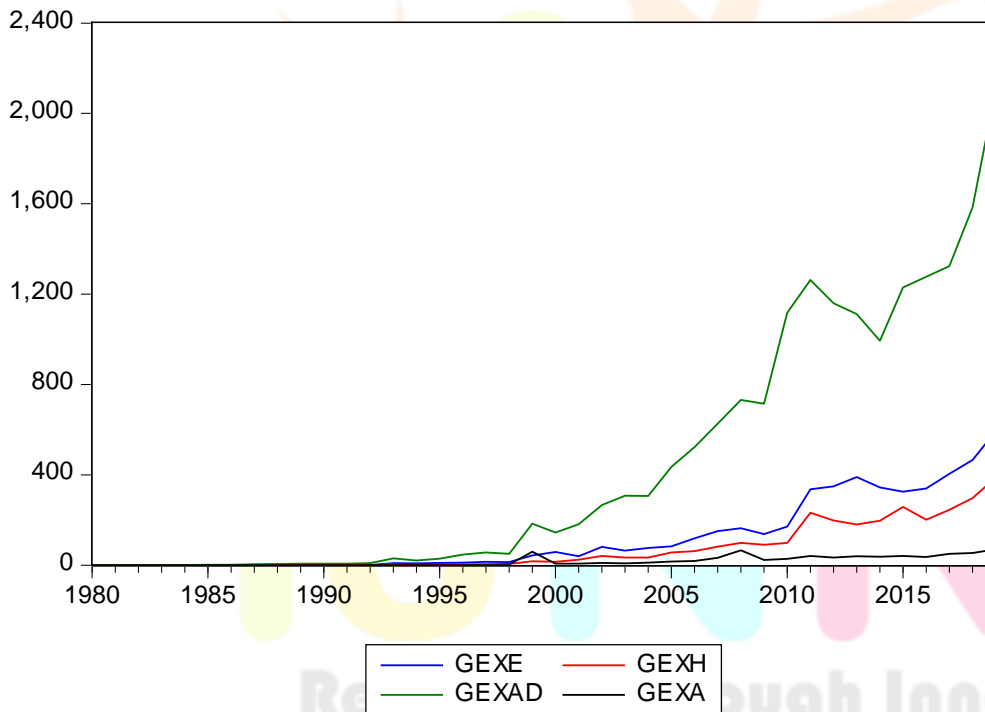


Fig. 1: Graph of Selected Sectoral Government Expenditure

### Unit Root Result

The Augmented Dickey-Fuller test result that was used to check the level of integration of the time series data used for this study is reported in Table 4.3.

The result reveals that all the macroeconomic variables used in the estimated model are integrated at order (0) except government expenditure on agriculture and education sectors, which are integrated at the first difference I(1). However, apart from the poverty indicator in the estimated model, those integrated at order zero (0) are not integrated at 1% level. Government expenditure on the health sector and road and construction are integrated at a 5% level while the rest of the variables are integrated at a 10% level. It is important to note that none of the variables were integrated at the second difference. This would have violated the assumption of



ARDL. Therefore, this makes it possible to adopt the ARDL technique in estimating the estimated equation. The result of this analysis is shown in Table 4.6.

**Table 4.3: Unit Root Result Using ADF Analysis**

VARIABLE	T-STATISTIC	1% CRITICAL	5% CRITICAL	10% CRITICAL	LEVEL OF INTEGRATION
GEXH	3.059822	-3.639407	-2.951125	-2.614300	I(0)*
GEXEC	-2.793111	-3.610453	-2.938987	-2.607932	I(0)**
GEXTC	-2.702988	-3.615588	-2.941145	-2.609066	I(0)**
GEXE	-3.937073	-3.615588	-2.941145	-2.609066	I(1)
POV	7.185944	-3.610453	-2.938987	-2.607932	I(0)
GEXRC	-3.643057	-3.661661	-2.960411	-2.619160	I(0)*
GEXA	-6.973653	-3.621023	-2.943427	-2.610263	I(1)
GEXAD	2.926544	-3.610453	-2.938987	-2.607932	I(0)**

Source: computed by the authors

### Correlation Test Result

Before the bound test was conducted for the developmental nature of government expenditure in Nigeria, the study conducted a correlation analysis to ascertain if there is any relationship between each of the spending in different sectors of the Nigerian economy and poverty in the nation. The result of this analysis is shown in Table 4.4. Here the result reveals that there is a very strong positive correlation coefficient between government expenditure on education and poverty in Nigeria. This implies that there is a strong relationship between the level of government expenditure on education and poverty in the country given a 97.4% correlation link between the two macroeconomic indicators. The expenditure on health reveals also that there is a strong relationship between the health sector and poverty in the Nigerian economy. This correlation coefficient shows as high a link as 97% between the health sector and poverty in the country. This implies that for government to affect poverty in the country they need to use the health and education sector as their medium to affect poverty in the country.

In addition, government expenditure on agriculture also exhibits a strong relationship with poverty in the country with a correlation coefficient of 83.4%. it is surprising to note that even government expenditure on administration also has a high positive correlation coefficient of 97% on poverty in Nigeria. This signifies that the cost of governance in the country affects the level of economic development in Nigeria. Expenditure on infrastructure in the country has a high correlation relationship with economic development, measured by the poverty index in the country. In summary, government spending on different sectors of the economy has a high correlation relationship with economic development. This means that government can affect economic development in the country through its expenditure. Government expenditure has a link to economic development in Nigeria based on this correlation result.

**Table 4.4: correlation result**

	GEXEC	POV	GEXAD	GEXA	GEXTC	GEXRC	GEXH	GEXE
GEXEC	1							
POV	0.6593	1						
GEXAD	0.7146	0.9705	1					
GEXA	0.5602	0.8344	0.8628	1				
GEXTC	0.6945	0.5587	0.6001	0.6355	1			
GEXRC	0.5947	0.9150	0.9463	0.8585	0.5772	1		
GEXH	0.5915	0.9711	0.9787	0.8387	0.5112	0.9552	1	
GEXE	0.6055	0.9748	0.9789	0.8456	0.5106	0.9407	0.9881	1

Source: computed by the authors

### Causality Test Result

In order to ascertain the direction of these relationships between government expenditure and economic development in Nigeria, this study conducted a pairwise causality test using the Granger causality technique. This is necessary since the correlation analysis does not specify the direction of the relationship but only indicates if there is a relationship or not. To the Keynes school of thought, it is government expenditure that causes economic development while to the Wagner schools, the reverse is the case. Therefore, this study used Granger causality analysis to examine the prevailing nature of the Nigerian economy. Table 4.5 presents the result of the pairwise Granger causality test. This test shows that there is a bidirectional causal relationship between government expenditure on education and economic development in Nigeria. This implies that the level of government expenditure affects the level of poverty in the country and the poverty level affects government spending in this sector. These two ways effect between these variables shows the importance of the education sector in managing poverty in the country. Also, Government expenditure on other economic

services has a bidirectional causal relationship with economic development measured by the poverty index in the country, meaning that government spending on other economic services in the country has a link to poverty in Nigeria and vice versa.

Moreover, spending on the health sector in the country Granger causes the level of development, and the level of economic development also granger causes health expenditure. This reveals an important picture in the Nigerian economy, as health spending is imperative to the welfare of the citizenry, and the level of poverty in the country will affect the level of health expenditure. The result also indicates that expenditure on infrastructure and expenditure on administration both have a bidirectional causal relationship with poverty in the Nigerian economy, whereas, government spending on agriculture and spending on transport and communication both have a unidirectional causal relationship with poverty in the country. The directions of their causality both flow from economic development (PoV).

**Table 4.5: Granger Causality Result**

<b>Pairwise Granger Causality Tests</b>			
Sample: 1980 2019			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
GEXE does not Granger Cause POV	38	10.0463	0.0004
POV does not Granger Cause GEXE		7.79171	0.0017
GEXEC does not Granger Cause POV	38	5.94920	0.0062
POV does not Granger Cause GEXEC		4.64146	0.0167
GEXAD does not Granger Cause POV	38	11.0499	0.0002
POV does not Granger Cause GEXAD		4.06634	0.0264
GEXA does not Granger Cause POV	38	0.63039	0.5387
POV does not Granger Cause GEXA		6.87703	0.0032
GEXTC does not Granger Cause POV	38	0.09588	0.9088
POV does not Granger Cause GEXTC		4.99554	0.0127
GEXRC does not Granger Cause POV	38	10.5705	0.0003
POV does not Granger Cause GEXRC		8.73623	0.0009
GEXH does not Granger Cause POV	38	15.6603	0.0000
<b>POV does not Granger Cause GEXH</b>		<b>10.3653</b>	<b>0.0003</b>

*Source: computed by the authors*

### Autoregressive Distributed Lagged Model Result

So far this study has been able to establish that there is a relationship between government expenditure and economic development (proxy by Poverty) in the Nigerian economy. To know the type of relationship existing between them, whether positive or negative, the study uses the autoregressive distributed lagged (ARDL) technique to achieve this. Table 4.6 depicts the result of this analysis. The result indicates that health expenditure in the current and first lagged year has a negative effect on poverty in Nigeria. This means that government expenditure on health reduces poverty in the country and therefore promotes economic development in the country. This variable is statistically significant in the estimated model. However, health expenditure in the second lagged year has a positive effect on poverty and is statistically significant in the model. The coefficient of Expenditure on education is negative in the current and the third lagged years while positive in the first and second years. These variables are all statistically significant except the second lagged year which is not statistically significant. For agricultural expenditure, it has a negative coefficient in its current, first, and third lagged years except for the second lagged year which is positive and is also statistically significant. The coefficient of government spending on infrastructure has a positive impact on poverty and is statistically significant in the estimated model. In the second lagged year, infrastructure expenditure (GexRC) reduces poverty in the country though not statistically significant in the estimated equation. From the result, we discover that government expenditure on administration (GexAD) has a positive coefficient and is statistically significant in the model. This means that the cost of governance in the country increases poverty in the country. This may be because the more government spend on this service the less there is resource to spend in the other sectors that would have reduced poverty in the country.

Finally, the government on other economic services (GexEC) has a negative coefficient on the dependent variable which is poverty. This implies that public spending on economic services promotes economic development as it reduces poverty in the country.

Table 4.6: Autoregressive Distributed Lagged (ARDL) Result

Dependent Variable: POV

Method: ARDL

Maximum dependent lags: 3 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (3 lags, automatic): GEXH GEXE GEXA GEXTC  
GEXRC

Fixed regressors: GEXAD GEXEC C

Number of models evaluated: 3072

Selected Model: ARDL(3, 2, 3, 3, 3, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
POV(-1)	1.245817	0.069563	17.90918	0.0000
POV(-2)	0.418194	0.095651	4.372090	0.0008
POV(-3)	-0.856144	0.077102	-11.10404	0.0000
GEXH	-675.6897	80.74587	-8.368103	0.0000
GEXH(-1)	-431.9774	82.39212	-5.242946	0.0002
GEXH(-2)	364.7495	53.41242	6.828927	0.0000
GEXE	-180.7862	73.50070	-2.459652	0.0287
GEXE(-1)	160.9631	26.48933	6.076527	0.0000
GEXE(-2)	59.35259	59.23871	1.001922	0.3347
GEXE(-3)	-245.3760	75.94945	-3.230781	0.0066
GEXA	-483.3313	38.84566	-12.44235	0.0000
GEXA(-1)	-461.2916	66.01731	-6.987434	0.0000
GEXA(-2)	239.8574	100.4818	2.387073	0.0329
GEXA(-3)	-192.9960	154.5136	-1.249055	0.2337
GEXTC	-771.1556	91.91446	-8.389927	0.0000
GEXTC(-1)	1198.391	274.4156	4.367067	0.0008
GEXTC(-2)	-374.1825	187.0691	-2.000237	0.0668
GEXTC(-3)	-853.6112	105.5279	-8.088959	0.0000
GEXRC	115.2264	29.88298	3.855920	0.0020
GEXRC(-1)	975.9613	67.48159	14.46263	0.0000
GEXRC(-2)	-45.64562	38.98777	-1.170768	0.2627
GEXAD	251.7946	15.71001	16.02766	0.0000
GEXEC	-569.9315	33.45425	-17.03615	0.0000
C	-373.4567	278.8118	-1.339458	0.2034
R-squared	0.999993	Mean dependent var	147586.4	
Adjusted R-squared	0.999980	S.D. dependent var	185731.2	
S.E. of regression	833.3963	Akaike info criterion	16.54022	
Sum squared resid	9029143.	Schwarz criterion	17.58514	
Log-likelihood	-281.9942	Hannan-Quinn criteria.	16.90861	
F-statistic	77738.84	Durbin-Watson stat	2.450151	
Prob(F-statistic)	0.000000			

\*Note: p-values and any subsequent tests do not account for model selection.

To examine if there is a long-run relationship between public expenditure and economic development in Nigeria, the study conducted a bound test. The result is presented in Table 4.7.

Since the f-statistic is greater than the critical values in both the lower and upper bound hence we conclude that there is a long-run relationship between public expenditure and economic development in Nigeria.

**Table 4.7: Bound Test Result**

ARDL Bounds Test		
Date: 02/04/21 Time: 14:25		
Sample: 1983 2019		
Included observations: 37		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k
F-statistic	150.6029	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

*Source: computed by the authors*

## Major findings

1. Public expenditure on health is seen to inversely affect poverty hence promoting economic development in Nigeria and is statistically significant.
2. Public expenditure on education also has a negative effect on poverty meaning that it reduces the level of poverty in the country. Based on this, public expenditure on education promotes economic development in Nigeria.
3. The findings also reveal that expenditure on agriculture promotes economic development as it decreases poverty in Nigeria
4. Government expenditure on administration otherwise regarded as the cost of governance, does not promote economic development as it increases the level of poverty in Nigeria.

## 5 POLICY RECOMMENDATIONS

For government to accelerate economic development in the country the following recommendations are given based on the findings of this study.

1 Increased public expenditure on the education sector. Policies should be made to boost investment in the education sector as this sector contributes positively to economic development in the country.

Government should increase its expenditure on the health sector since, according to the result; health expenditure is an engine room for economic development in Nigeria.

This will increase the level of total welfare by reducing poverty in the country.

From the result of this analysis cost of governance should be reduced to promote economic development in Nigeria. When this is done more resources will be available to channel into the sector that promotes economic development in the economy.

Also, the government should encourage investment in the agricultural sector as this sector promotes economic development, but less attention is paid to this sector. Increased expenditure in this sector will, in the long run, cause the multiplier effect will be an increase in employment, total productivity as well as poverty reduction in the economy.

## CONCLUSION

For the Nigerian government to be regarded as a developmental state, government intervention is needed in the economy in terms of an increase in expenditure on health, education, and the agricultural sector. This will vigorously promote economic development in the country and gradually move Nigeria from a developing state to a developed one.

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