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Impact of Government Expenditure on Economic Growth in Nigeria: 1970-2020

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ABSTRACT

In this study, the impact of government expenditure on Nigeria's economic growth rate from 1970 to 2020 is analyzed. OLS was used to estimate the connection between the variables over the long run. The findings show a positive link between the Log of Gross Domestic Products (LGDP's) log and its initial lag, which is statistically significant. The result reveals a positive association between the (LGDP) and the log of recurrent government expenditure (RGE), as well as between the (LGDP) and the log of first lag of recurrent government expenditure (RGE). A positive link exists between the (LGDP) and the log of capital government expenditure (CGE), but a negative relationship exists between the (LGDP) and the log of first (CGE). The link between the (LGDP) and the domestic debt of the federal government (LFGDD) is inverse, while the relationship between the logs of the first lag of the domestic debt of the federal government (LFGDD) is positive. The R2 determination coefficient is 0.698968. The outcome demonstrates that explanatory factors account for 70% of the variation in the (LGDP). The model is acceptable since the F-statistic 3595.905 with a probability of 0.000000 is significant at 1%. The long-term trend of the explanatory variables, which has increased since the year 1985, is linked to GDP. The outcome presented above also depicts the predicted short-run relationship. Therefore, it is recommended that government expenditure be examined and bolstered to have a positive impact on Nigeria's growth rates.

1. Introduction

A significant public discussion has emerged regarding the influence of growing government operations on economic growth in developing economies. Despite this, the observed increase in public expenditure seems to apply to the majority of nations, regardless of how advanced their economies are. Adolf Wagner developed the growing state activity law in 1893, which asserts that increased government expenditure results in higher levels of economic development. The assumption was principally inspired by Germany's fast-paced industrial and economic development in the nineteenth century. This is justified because industries with high social importance and low rates of return would not draw private investment, necessitating the use of public funds. Government policies are designed to improve allocative and distributive equality by distributing more public and quasi-public commodities. Government intervention might be viewed as a crucial component of public expenditure intended to achieve the best results in the provision of certain public goods.

However, the role and size of government become crucial to adjustment and stabilization programs given the degree of openness of less developed countries, the dependence on trade, and the susceptibility to external shocks. The debate over the size of government is divided into two schools of thought. The first contends that increased government involvement is harmful to the system's effectiveness, production, and growth. This opinion is supported by the fact that the public sector lacks market responsiveness, has a massive regulatory structure that raises production costs and is vulnerable to distortions brought on by both fiscal and monetary policy. On the other hand, proponents of government argue that to put the economy on a planned growth path, some products and services must be provided that the private sector would not otherwise supply. The failure of the market brought on by externalities is the premise of the latter stance.

As public expenditure in Nigeria continues to increase public debt, both theoretical and empirical economists have shown a great deal of interest in the relationship between government expenditure and economic growth. Due to the lack of agreement on the findings and recommendations made, current academic research has produced outcomes that have been more perplexing than beneficial (Nyasha and Odhiambo, 2019; Okpabi, & Akiri, 2021). Yasin, 2000; Attari, Javed, 2013; Kimaro, Keong, and Sea, 2017 are a few researchers that found a favourable influence, while Nurudeen, Usman, 2010 and Sáez-Garca, Rodrguez, 2017 reported a detrimental impact. Additionally, several studies have concluded that public expenditure has little to no effect on economic expansion (see Schaltegger and Torgler, 2006; Hasnul, 2015). One cannot overstate the importance of comprehending the nature of the impact, if any, of government expenditure on economic growth in the current environment of low domestic and global economic growth rates, skyrocketing public debt, and borrowing by governments to increase expenditure to boost their economies.

Economic expansion is a key macroeconomic goal because it makes it possible to raise living standards and create jobs. A rapidly increasing growth rate not only attracts attention from around the world but also prepares the road for development. Economic growth means an increase in a nation's potential for production. It describes a rise in the volume of products and services produced in a nation through time. The most comprehensive gauge of economic expansion is the gross domestic product (GDP). It indicates the total market value of all commodities and services generated throughout an economy, typically one year. For developing nations in particular, the link between government expenditure and economic growth is crucial. The need to free themselves from the grip of extreme poverty and put themselves on the path of rapid progress is the reason behind this.

To do this, governments in developing nations have started a variety of expenditure initiatives. Unfortunately, economic theories do not always lead to conclusive findings about how government expenditure affects economic growth. It has caused a lot of debate among academics. Some academics contend that raising government expenditure will enhance output and help prevent economic downturns. For instance, in their many research on the relationship between government expenditure and economic growth, Agbonkhese and Asekhome (2014), Akpan and Abang (2013), and Okoro (2013) all came to the same conclusion: Government expenditure has a positive and considerable impact on economic growth. A boost in government expenditure, particularly when it is financed by borrowing, may slow economic growth, according to some academics. These include Folster and Henrekson (2001), Egbetunde and Fasanya (2013), and others who hypothesized that there is no discernible link between government expenditure and economic growth. Over the years, the connection between public expenditure and economic expansion has remained dormant. Expenditure on social and economic infrastructure, such as roads, telecommunication, schools, energy, and health, typically has a favourable effect on the country's output. However, in developing nations, an increase in government expenditure typically increases taxation or borrowing. As a result, there will be less overall demand as per capita income and labour demand decline. These factors increase interest in learning how government expenditure affects economic expansion.

By the end of 2019, Nigeria's national government had spent roughly 9.7 trillion dollars (Varrella, 2021). Because of factors including the expansion of the civil service and the disproportionate remuneration for political office holders, a sizeable part of the federal government's expenditure in Nigeria has gone toward recurrent costs over time. From 36.21 billion (or $4.5 billion) in 1990 to almost 3.109 trillion (or $20.68 billion) in 2010, recurring expenditures grew. From 24.04 billion (approximately $2.9 billion) in 1990 to 234.45 billion (about $2.29 billion) in 2000, the total amount of capital expenditure climbed at a decreasing rate. As of 2010, capital expenditure totalled 883.87 billion (nearly $5.88 billion). However, as of 2010, just recurrent expenses made up more than 75% of all government expenditures (CBN, 2017). Nigeria's general government spent 18,672 billion LCU in total in 2020. Nigeria's general government total expenditure climbed by an average annual rate of 12.97% from 2,510 billion LCU in 2001 to 18,672 billion LCU in 2020 (CBN, 2021).

On this topic, several types of research have been done. The lack of consensus in past research findings, however, is revealed by a review of the earlier empirical literature and indicates a research gap. The Impact of Government Expenditure on Economic Growth in Nigeria is the primary goal of this study to close that gap.

2.0 Literature Review and Theoretical Framework

2.1 Conceptual Review

The two key concepts employed in this study are government expenditure and economic growth.

2.1.1 Concept of Government Expenditure

The idea of government expenditure came about because people believed that any expenditures made by the government were public. Public sector expenditure and government purchasing are other names for government outlays. The size of government expenditure has been increasing over time. As a result, the size of the public sector is calculated by dividing all government expenditures by the GDP of the entire country. This ratio, which is referred to as the size of the public sector, was used in this thesis. The costs of all three levels of government in Nigeria were used as the data for public expenditures in this research (thesis). Recurrent and capital expenditures are two examples of how public expenditure can be broken down or categorized. The cost of stationery, employee pay and salary, fuel, electricity bills, and other monthly costs are examples of recurring expenses. Construction projects that the government undertakes to build roads, bridges, hospitals, military installations, and equipment are referred to as capital expenditures.

2.1.2 Concept of Economic Growth

Because it has long been acknowledged as a crucial goal of economic policy, a sizable body of research has been devoted to explaining how economic growth might be accomplished (Fadare, 2010). Economic growth is the expansion of a nation's potential GDP or output. If the societal rate of return on investment is higher than the private return, for instance, tax measures may encourage growth rates and utility levels. According to Olopade & Olopade (2010), the ideal tax policy concentrates on the characteristics of services in development models that include public services**.** The causes of states' different rates of growth over time have also been clarified by economic growth, and this affects the government's monetary policy as well as the tax and expenditure levels that will decide growth rates. Economic growth is the gradual increase in the market value of the goods that a country's economy produces. 2016 Economic Outlook for Africa Typically, it is expressed as the real gross domestic product, or real GDP, growth rate in percentage terms. The per capita income growth rate, commonly referred to as the GDP per capita growth rate, is more important. An increase in per capita income is referred to as intensive growth. According to Gordon (1999), extensive growth is defined as GDP growth that is exclusively attributed to gains in territory or population.

2.2 Theoretical Review

2.2.1 Wagner's Law (Theory of Increasing State Activities): The theory, which was named after its proponent Adolph Wagner (1835–1917), advanced the understanding of the "law of escalating public expenditure" by taking into account changes in government expenditure growth and the size of the public sector. The statute specifies (i) The expansion of the public sector's duties or obligations, especially in the case of unindustrialized countries, results in an increase in public expenditure on management, economic policy, and other areas; (ii) Every economy's drive toward industrialization would result in an increase in political density for social development, necessitating better authorization for social consideration in commercial operations. (iii) The public sector will have a relative expansion as a result of the rise in public expenditure, which will be more than the national revenue increase in comparison. According to Musgrave and Musgrave, who argued in favour of Wagner's law, the domestic economy's public sector grows significantly as industrialization proceeds in forward-thinking nations.

2.3 Empirical Review

Bingilar & Oyadonghan (2020) investigated the effect of government expenditure on GDP-proxied economic growth. For the years 1998 to 2017, secondary time series panel data were gathered from the Central Bank of Nigeria's (CBN) Statistical Bulletin. Gross Domestic Product (GDP), the dependent variable and a proximate for economic growth, was regressed as a function of the Inflation rate (IFR) and Interest rate (INTR), the independent variables, in the study using the Ordinary Least Squares (OLS) technique based on the computer program Windows SPSS 23 version. The analyses' findings demonstrated that neither the inflation rate nor the interest rate significantly affect Nigeria's GDP or economic growth. Based on the findings, the study recommended that the government implement measures to control inflation as well as financial policies that promote interest rates that are favourable to investment and take into account other factors that harm foreign investment in the nation to maintain sustainable economic growth.

Aluthge, Jibir, & Abdu (2021) used time series data covering the years 1970–2019 to examine the effect of Nigerian government expenditure on economic growth. The Autoregressive Distributed Lag (ARDL) model is used in this paper. The unit root test and the co-integration analysis in the study consider structural breaks to ensure that the conclusions are robust. The study's main conclusions are that whereas recurrent expenditure does not have a substantial impact on economic growth in either the short- or long-term, capital investment does, both in a positive and significant way. The report makes the recommendation that government should boost the share of capital expenditure, particularly on significant projects that directly affect the welfare of citizens. Government should carefully reallocate resources toward constructive activities that would advance the nation's human development to improve the expenditure patterns for ongoing expenses.

Okpabi, Ijuo, & Akiri (2021) looked at how government expenditure changed Nigeria's economic growth from 1984 to 2015. The study used Johansen co-integration and the Error Correction Model. The empirical findings supported the Keynesian and Endogenous Growth Models' assertion that public expenditure stimulates economic growth in Nigeria over the long term, with a significant positive impact on long-term economic growth and a negligible short-term negative impact. Accordingly, the study recommended that the Nigerian government restructure its expenditure priorities to make room for more capital expenditure. It also suggested that expenditure increases be directed toward some crucial economic sectors, including those related to health, power, education, and general infrastructure.

Opoku & Ennin (2022) examine the influence of government expenditure on economic growth in Ghana using data from 1970 -2016, employing Autoregressive Distributed Lag (ARDL), an econometric estimation technique. The results of their study show that government expenditure has a positive effect on economic growth in the short run, and they also demonstrate a significant positive relationship between growth capital formation and foreign direct investment in both the short and long terms. Therefore, since it encourages economic growth, the study suggests that the government increase public expenditure on successful projects.

It is clear that the majority of earlier researches mostly examined government spending on its aggregate character. Furthermore, the majority of these studies have a scope gap because they typically take 20 years to collect the data. The Nigerian federal government's spending on economic growth has not received much attention recently. As a result, from 1970 to 2020, this study will empirically evaluate the effect of disaggregated government spending on economic growth in the case of Nigeria. Recurrent and capital expenses will be separated from total government spending. This analysis finds more relevance and rationale in light of the gap that was established. Therefore, this research will subject government spending to its sectorial patterns and also use percentage changes in GDP to capture growth rather than absolute GDP to fill the gap.

3.0 METHODOLOGY

3.1 Research Design

In this study, the effect of federal government expenditure on Nigeria's economic growth rate from 1970 to 2020 will be investigated. The pace of economic growth, ongoing and capital government expenditure, and domestic government debt are some examples of secondary statistics used. Data for the macroeconomic time series were taken from the Statistical Bulletin of the Central Bank of Nigeria. In response to this worry, the current study uses a unit root test to first determine the genuine nature of stationary qualities for each variable being studied. Since unit root issues are a regular occurrence in the majority of time series research, doing this is essential to avoid the issue of spurious regression. The data's stationarity was a combination of I(0) and I(1). The goals were accomplished using a single equation model. Thus, the ARDL estimate technique is used to accomplish the study's general and detailed goals. In ARDL, the Error Correction Model (ECM) can be used to define the properties of the dynamic interaction between the variables. The Grangerian causality relation is also implied by the characteristics of co-integrated series, and it can be evaluated by determining whether the past observations of one of the two variables successfully predict those of the other.

3.2 Model Specification

The aim of this study is to investigate how public expenditure affects economic expansion. To accomplish this, the study adapts the Egbo, Nwankwo, and Okoye (2016) model. Modelling economic growth (GDP) as a function of sectorial expenditure is how their model is described. It is stated functionally in this way:

GDP=F (GEXPA, GEXPE, GEXPS, GEXPT) (3. 1)

In terms of economics, we depict the model as follows:

$GDP = GDP = \beta_0 + \beta_1 GEXPA + \beta_2 GEXPE + \beta_3 GEXPS + \beta_4 GEXPT + Ut$ (3.2)

Where:

GDP = Gross domestic product

GEXPA = government expenditure on administration

GEXPE = government expenditure on economic services

GEXPS = government expenditure on social community services

GEXPT = government expenditure on transfers

$\beta 0$ = Constant.

$\beta 1$- $\beta 6$= Regression coefficients.

Ut = Error Term.

Our fundamental long-run model for figuring out how the transmission of public expenditure affects economic growth in Nigeria is Equation 3.1. The requirement to include a model that takes into consideration the

short-run dynamic adjustment process or the rate at which short-run disequilibrium is converted into long-run equilibrium has received significant support in recent financial econometrics literature.
However, we disaggregated the public expenditure, hence, our new model will be:
GDP = f(RGE, CGE, FDD) (3.3)
Where
GDP= gross domestic product
RCE=recurrent public expenditure
CGE= capital public expenditure
GDD= government domestic debt
Specifying the model in econometric form, we have;
$GDP_t = \alpha_0 + \alpha 1RGEt + \alpha_2 CGE_t + \alpha_3 GDD_t + U_t$ (3.4)
GDP is the Dependent while RGE, CGE and GDD are the independent variables.
Equation (3.3) is meant to explain the impact of government expenditure on economic growth in Nigeria. α_0, α_1, α_2, α_3, are the parameters to be estimated in the equation

3.3 Estimation and Evaluation Techniques and Procedure

3.3.1 Unit Root Test

It makes sense to estimate an Augmented Dickey-Fuller regression when examining the stationary qualities of each observed time series (Yt) over a specified period (T). Take into consideration a non-stationary time series variable [AR (1)], which is produced by a first-order autoregressive process. resulting in an Augmented Dickey-Fuller (ADF) test that looks like this: The subsequent regression estimates the general form of the ADF test:

$$\Delta Y_t = \beta_i + \delta Y_{t-i} + \sum_{i=1}^{n} \alpha_i \Delta Y_{t-i} + \varepsilon_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (3.5)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta Y_{t-i} + \varepsilon_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots (3.6)$$

Where Y denotes the time series variable under investigation, t denotes a linear time trend, denotes the first difference operator, 1 denotes the constant, n denotes the ideal number of lags for the dependent variable, denotes the summation sign, and t denotes a pure white noise error term. With intercept, trend, and intercept, respectively, Models (3.5) and (3.6) are general forms of ADF tests.
n is the ideal number of the lag length in the dependent variable (Yt), and it is solely determined by the parameter. This determines the stationary of the series under a null hypothesis, H0: = 0 (meaning non-stationary), in contrast to an alternative hypothesis, H1: 0 (meaning the series is stationary). Keep in mind that Yt refers to a certain time series variable.

It is stated that the ADF unit root testing approach alone is insufficient in finite samples, hence the Philips-Perron (1988) unit root test will be used as an additional test given that this study uses a finite number of observations. As previously stated, a Co-integration test using Johansen's method should be run if all the variables of concern are found to be stationary (of the same order) after getting the first or second difference. Multivariate Co-integration would be employed as a result.

3.3.2 Co-integration Test

The theory behind testing for Co-integration is that even while the differences between two or more time series variables are stationary in the long run, the variables themselves are trending over time (non-stationary). As a result, these variables in this instance can be viewed as constituting a long-term equilibrium connection because their differences are stationary (Hall et al., 1989). However, if the time series variables do not show a long-term equilibrium relationship, they will in theory drift apart randomly and aimlessly since their differences are not stable (Dickey & Fuller, 1981). We test for r (the greatest number of co-integrating relationships) using the trace test and the maximum Eigen-value approach.
The trace statistic is given as:

$$\lambda_{trace} = \sum_{n-t+1}^{k} \ln (I - \lambda_j)^{-T} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots .3.7)$$

λ _j is the biggest eigenvalue, and T is the total number of period observations. The co-integrating rank is r and the VAR process is according to the null hypothesis. It is important to note that this study will use the Akaike Information Criterion (AIC) and Hannan-Quinn Information Criterion (HQIC) to establish the ideal lag time before running the Johansen co-integration test.
The number of co-integrating vectors is denoted by r_0; the trace test is calculated under the null hypothesis:
$H_0: r_0 \leq r$
$H_1: r_0 = r$

Decision Rule: reject the null hypothesis if $|\tau_{cal}|>|\tau_{tab}|$ at the level of significance, do not reject if otherwise.

3.3.3 Causality Tests

Finding the lead/lag relationship between variables is our major goal while analyzing Granger-Causality relationships. To answer the question of whether X causes Y, Granger (1969) suggests first determining how much of the current Y can be described by past values of Y and then examining whether the explanation can be strengthened by including lagged values of X. If X aids in the prediction of Y or if the coefficients on the lagged Xs are statistically significant, X is considered to be the Granger cause of Y. The frequent occurrence of two-way causation, where X Granger causes Y and Y Granger causes X, should be noted. As a result, this study will examine a scenario of Granger causality that involves five endogenous variables: the real GDP rate, ongoing government expenditure, capital expenditure, and domestic government debt. The phrase "X Granger- causes Y" should not be interpreted to mean that Y is X's impact or outcome. Granger-causality measures information content and precedence but does not by itself imply causality in the sense that the term is most commonly used. Since the Granger technique is based on the idea that VAR models are challenging to interpret, it is preferable to utilize more lags in the test regressions than fewer. It is essential to select a lag duration that is consistent with reasonable expectations for the longest period during which one variable could contribute to the prediction of another.

The following equations are used to determine the causality:

$$\Delta Y_t = \alpha + \sum_{i+1}^{m} \beta_i \Delta Y_{t-1} + \sum_{i=1}^{m} \gamma_i \, \Delta X_{t-i} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.8)$$

$$\Delta X_t = \alpha + \sum_{i+1}^{m} \beta_i \Delta X_{t-1} + \sum_{i=1}^{m} \psi_i \, \Delta Y_{t-i} + \mu \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.9)$$

Where Y_t and X_t are defined as Y and X observed over periods; Δ is the difference operator; m represents the numbers of lags; α, β, ψ and γ are parameters to be estimated; and μ represents the serially uncorrelated error terms. The test is based on the following hypotheses:

H_0: $\gamma_i = \psi = 0$ for all i's

H_1: $\gamma_i \neq 0$ and $\psi \neq 0$ for at least some i's.

At this point, it is necessary to examine the criteria for causality. The hypothesis would be tested by using chi (χ2) statistics. If the values of the γi coefficient are statistically significant but those of the ψ are not, then X causes Y (X→Y).On the contrary, if the values of the coefficients are statistically significant but those of the coefficient are not, then Y causes X (Y→X). If both are significant, then there exists bidirectional causality between X and Y (X⇄have a case of independence or no causal relationship between X and Y (X⇎Y).

3.3.4 Stability Test

The stability test is carried out to show if the model invoked is stable to allow for forecasting. For a set of n time series variables$y_{1t} = (y_{1t}, y_{2t}, \ldots, y_{nt})'$ a VAR model of order p [VAR(p)] can be written as:

$$y_i = A_1 A_{t-1} + A_2 y_{t-2} + \cdots + A_p y_{t-p} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.10)$$

Where the A_i's are (nXn) coefficient matrices and $\mu_t = (\mu_{1t}, \mu_{2t}, \ldots, \mu_{nt})'$ is an unobservable zero mean error term. Following the above identity, the stability of a VAR can be examined by calculating the roots of:

$$(I_n - A_1 L - A_2 L^2 \ldots) y_t = A(L) y_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.11)$$

The characteristic polynomial is defined as:

$$\pi(Z) = (I_n - A_1 z - A_2 z^2 \ldots) y_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.12)$$

The roots of $|\pi(Z)| = 0$ will give the necessary information about the stationarity or non-stationarity of the process. The necessary and sufficient condition for stability is that characteristic roots lie outside the unit circle. The full rank and all variables are stationary.

4.0 Data Presentation Analysis and Interpretation of Results

4.1 Data Presentation

The data and their log form series are presented in Appendix I. Accordingly, the descriptive statistics and correlation matrix was presented and to determine the true nature of stationary qualities for all the variables under investigation, the study first employs the unit root test.

4.1.1 Descriptive Statistics of Data

Table 4.1 provides the data's mean, minimum and maximum values, standard deviation, skewness, kurtosis, and Jarque-Bera test, which also describes the fundamental statistical characteristics of the data under examination. These descriptive statistics provide our data's behaviour with a historical context.

Table 4.1: Descriptive Statistics

	GDP	RGE	CGP	FGDD
Mean	23832.99	1118.575	370.4008	2243.1
Median	2329.005	125.96	96.03	413.7791
Maximum	144210.5	6997.39	2289	14272.64
Minimum	5.2811	0.7161	0.1736	0.9873
Std. Dev.	38850.11	1741.491	505.2421	3825.488
Skewness	1.651579	1.630884	1.690099	1.88565
Kurtosis	4.553274	4.805755	5.952506	5.382295
Jarque-Bera	27.75732	28.95807	41.96465	41.45422
Probability	0.000001	0.000001	0	0
Sum	1191649	55928.73	18520.04	112155
Sum Sq. Dev.	7.40E+10	1.49E+08	12508207	7.17E+08
Observations	50	50	50	50

Source: Author's computation from Eviews 9, 2022

The Skewness in Table 4.1 quantifies the asymmetry in the distribution of the series around its mean. A normal distribution or other symmetric distribution has zero skewness. The distribution has a long right tail if the skewness is positive, and a long left tail if the skewness is negative. In terms of the research's variables. As the data series deviates from normalcy while preserving positive skewness, it suggests that the distribution is asymmetric or non-normal and has a long left tail. Additionally, it suggests that the prices are not chosen at random and that the past may provide insight into the present.

Kurtosis gauges whether the series' distribution is peaked or flat. The kurtosis of the normal distribution is 3. In comparison to the normal, the distribution is peaked when the kurtosis is greater than 3, flat when it is lower than 3, and leptokurtic when it is equal to or less than 3. The kurtosis statistic similarly demonstrates that the variables were leptokurtic while FGDD was platykurtic. This is because market forces rather than arbitrary pricing decisions were used to decide the prices.

A test of normality is the Jarque-Bera test. The test's null hypothesis is that the series under investigation has a normal distribution. According to our findings utilizing the Jarque-Bera statistics P-values, none of the variables had a normal distribution because the P-values were less than 0.5. But it's crucial to remember that the normalcy condition is not necessary for the multivariate framework.

4.1.2 Correlation matrix

A table displaying the correlation coefficients between the variables utilized in this research is called a correlation matrix. The correlation between the two variables is displayed in each cell of the table. This correlation matrix can be used to summarize data, as input for more sophisticated analyses, or as a diagnostic tool.

Table 4.1.2 Correlation coefficients between the variables

	GDP	RGE	CGP	FGDD
GDP	1			
RGE	0.991414721	1		
CGP	0.900213421	0.932925644	1	
FGDD	0.990137268	0.975461783	0.864457126	1

Source: Author's computation from Eviews 9, 2022

According to Table 4.1.2, all of the variables have a favourable and significant association with one another.

4.1.3 Trend Analysis

Below is a graphical representation and analysis of the four series in their observation form:

Figure 4.1: Graph of the GDP

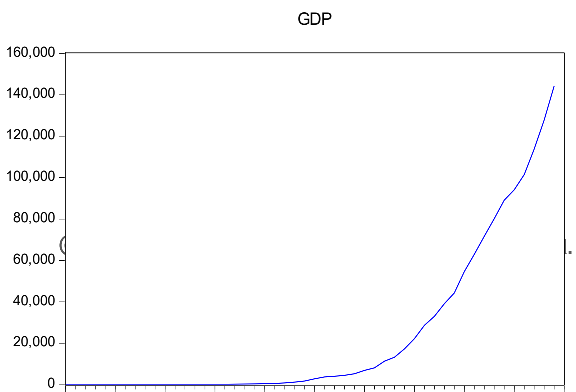
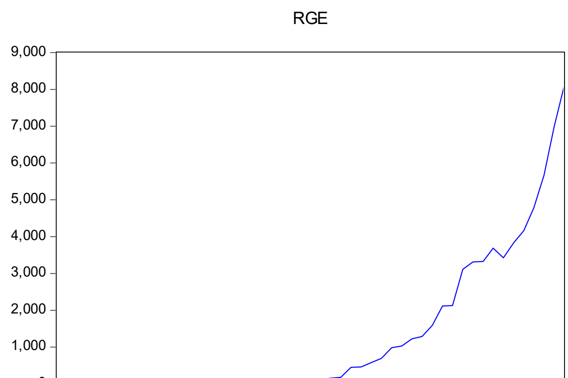


Figure 4.2: Graph of the Recurrent Government Expenditure (RGE)



In Figure 4.1 above, the Gross Domestic Product exhibits a steadily rising trend across the research period. The year 2019 saw the highest GDP ever recorded, at N144210.5 billion.

In Figure 4.2 above, the RGE data exhibits a rising trend with some degree of variability over the study period; the variable increased from N 7.58 billion in 1985 to N 6,997.39 in December 2019. Crude oil prices fell globally in late 2014, dropping from N3,689.06 billion in 2013 to N3,426.90 billion. But in 2015, overall recurring expenditure increased.

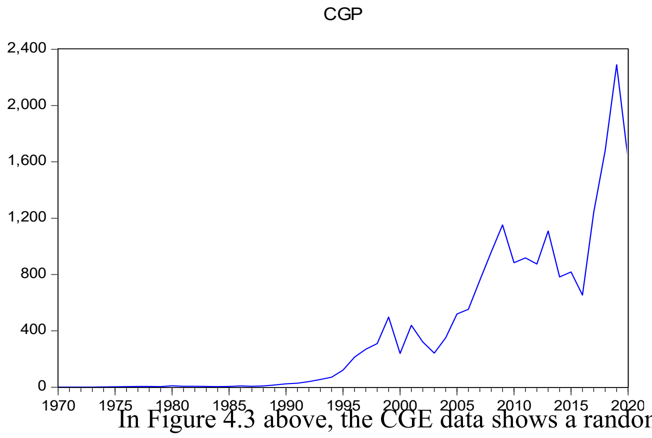


Figure 4.3: Graph of the Capital Government Expenditure (CGE)

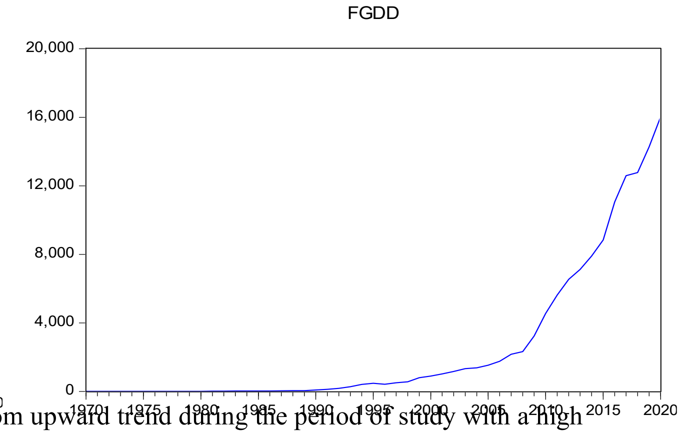


Figure 4.4: Graph of the Federal Government Expenditure Domestic Debt (FGDD)

In Figure 4.3 above, the CGE data shows a random upward trend during the period of study with a high level of fluctuations.

In Figure 4.4 above, the FGDD shows a rising trend with some degree of variations over the study period; the variable increased from N 27.9491 billion in 1985 to its peak value of N 14272.64 billion in 2019.

4.1.4 Unit Root Test

The issue of nonstationary data series, which causes skewed estimates and high R2 due to false regression of explanatory variables with trends and overestimation of t-values in the case of autocorrelation, is one that time-series models frequently face. As a result, the unit root test is necessary, and the unit root tests taken into account in this research include the Augmented Dickey-Fuller (ADF) conventional unit root tests. An observable time series that is not stationary (i.e., has a unit root) is the null hypothesis for ADF. Below are reports of the unit root test results for the series:

4.2.1 Summary of the unit root result

Variables	At level	At first difference	Critical Value (%)			P-Vale	Order of Integration
			1	5	10		
LGDP		-4.613653*	-4.262735	-3.552973	-3.209642	0.0000	I(1)
LRGE	-3.136091**		-3.646342	-2.954021	-2.615817	0.0335	I(0)

LCGE	-6.596596*	-4.262735	-3.552973	-3.209642	0.0000	I(1)
LFGDD	-4.993186*	-4.262735	-3.552973	-3.209642	0.0016	I(1)

Note: *, ** and *** imply significance at 1%, 5% and 10% respectively.
Source: Author's computation from Eviews 9, 2022

The outcome demonstrates that the LRGE was stationary at levels while the LGDP, LCGE, and LFGDD were stationary at first difference. Since the time series data were a mixture of I(0) and I(1), the order of integration.

4.2 Estimation of ARDL Models

Johansen and Juselius's (1990) Co-integration approach cannot be used when taking into account a single equation model. Therefore, it is essential to use the Autoregressive Distributed Lag (ARDL) technique to Co-integration or the bound process provided by Pesaran and Shin (1995) and Pesaran et al. (1996b) for a long-run connection, regardless of whether the underlying variables are I(0), I(1), or a combination of both. In this case, applying the ARDL technique to Co-integration will result in accurate and effective transmission estimates. The Autoregressive Distributed Lag (ARDL) technique to Co-integration aids in detecting the cointegrating vector(s), in contrast to the Johansen and Juselius (1990) Co-integration procedure. That is, each of the underlying variables can be represented by a separate long-term connection equation. If just one cointegrating vector (that is, the underlying equation) is discovered, the ARDL model of the cointegrating vector is reparametrized into ECM. The reparametrized solution offers both short-run dynamics (conventional ARDL) and the long-run connection of the variables in a single model. Re-parameterization is possible since the ARDL is a dynamic single-model equation with the same form as the ECM. A distributed lag model includes regressors with an indefinite amount of lag in a regression function.

4.2.1 Co-integration testing requirements for the Use of the Autoregressive Distributed Lag Model (ARDL) Approach

Whether the underlying variables are I(0), I(1), or a combination of the two, the ARDL method can be applied. Pretesting problems are eliminated by classifying the variables into I(0) and I(1) as part of the standard Co-integration methodology. Because there is only one long-term relationship between the underlying variables, the bound Co-integration testing approach is robust and does not necessitate pre-testing the model's variables for unit roots.

The ARDL error correction representation becomes comparatively more effective if the F-statistics (Wald test) proves that there is only one long-run relationship and the sample data size is small or finite. The ARDL technique cannot be used if the F-statistics (Wald test) show that there are many long-run relations. As a result, a different strategy like Johansen and Juselius' (1990) can be used. That is, a multivariate approach must be used if the different single expressions or equations of the underlying individual variable as a dependent variable demonstrate a feedback effect (many long-run interactions) between the variables.

Instead of using the Johansen and Juselius approach, the ARDL approach can be used if the trace, maximum eigenvalue, or F-statistics show that there is only one long-run relationship.

4.2.2 Lag Length Selection Criteria

The number of lags to be included in the ARDL model before the bond test was determined using the optimum lag length selection criteria before the ARDL technique was studied. To avoid misspecification and autocorrelation issues, the best lag choice must be taken into account (Giles, 2016).

Table 4.2.2: Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-87.76875	NA	0.003059	5.561742	5.743137	5.622776
1	65.14589	259.4915*	7.69e-07*	-2.736115*	-1.829140*	-2.430945*
2	79.67690	21.13601	8.81e-07	-2.647085	-1.014531	-2.09778

* LR: sequential modified LR test statistic (each test at 5% level), which reveals the lag order chosen by the criterion, Final Prediction Error (FPE) AIC stands for Akaike Information Criteria. Information criteria SC stands for Schwarz and HQ for Hannan-Quinn.
Source: Author's Computation using E-views 9, 2020

From Table 4.2.2, the Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ) indicate that one maximum lag is to be included in the ARDL model.

Table 4.2.3 ARDL Bounds Test for Co-integration (ARDL Model)

Dependent Variable : D(LGDP)		
Function: (LGDP / LRGE, LCGP, LFGDD)		
F-statistic		**17.05122 *****
K	**3**	
Critical Value Bounds		
Significance	**Lower Bound**	**Upper bound**
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Note: *** Statistical significance at 1% level; ** statistical significance at 5%;
* Statistical significance at 10%.
Critical values are obtained from Pesaran, Shin and Smith (2001).
Source: Authors' computation using E-views 9

To verify whether there is Co-integration among the variables included in the unconstrained error correction version of the ARDL model, the unit root test and the optimal lag selection have already been performed. The binding testing method has been used to estimate this, with the findings shown in Table 4.2.3.

The findings of the bound test show that there is a long-term relationship between the variables. The null hypothesis that there is no Co-integration in the function (LGDP/LRGE, LCGP, LFGDD) is rejected at the 1% level because the F-statistic, 17.05122, is higher than the critical value, 4.66, at the upper bound, showing that there is Co-integration between the variables.

4.2.3 Result for the Long run equation of the ARDL Model

Table 4.2.4 ARDL I Model Long run coefficients

Dependent Variable: LGDP				
Independent Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LGDP(-1)	0.649970	0.067960	9.564007	0.0000***
LRGE	0.115263	0.063746	1.808159	0.0822*
LRGE(-1)	0.110578	0.063267	1.747804	0.0923*
LCGP	0.031189	0.044682	0.698022	0.4914
LCGP(-1)	-0.007846	0.044784	-0.175189	0.8623
LFGDD	-0.068627	0.105946	-0.647756	0.5228
LFGDD(-1)	0.176406	0.111697	1.579330	0.1264
C	1.102310	0.173719	6.345355	0.0000***
R^2 = 0.698968				
F-Statistics = 3595.905 (0.000000)				
Durbin-Watson Statistics = 1.749028				

Note: * Statistical significance at 1% level; ** statistical significance at 5%;**
*** Statistical significance at 10%**

Critical values are obtained from Pesaran et al. (2001). Source: Authors' computation using E-views 9.

OLS was used to evaluate the variables' long-term equilibrium connection. The data shown in Table 4.2.4 indicate that there is a positive association between the LGDP and its initial lag, which is statistically significant. The results also demonstrate that there is a positive association between the log of gross domestic product (LGDP) and the log of recurrent government expenditure (RGE), as well as between the log of gross domestic product (LGDP) and the log of first lag of recurrent government expenditure (RGE).

The findings also show a positive link between log gross domestic product (LGDP) and log capital government expenditure (CGE) and a negative association between log gross domestic product (LGDP) and log first lag of capital government expenditure (CGE).

Additionally, it shows that while the link between the log of the gross domestic product (LGDP) and the log of the domestic debt of the federal government (LFGDD) is inverse, the relationship between the log of the GDP and the log of the domestic debt's first lag is positive.

The R2 determination coefficient is 0.698968. The findings indicate that explanatory factors are responsible for 70% of the variation in the gross domestic product (LGDP). The model is suitable since the F-statistic 3595.905 with the probability of 0.000000 is significant at 1%. Thus, the long-term trend of the explanatory variables, which has been rising from the year 1985, is related to the gross domestic output.

4.2.4 Result for the Short run equation of the ARDL Model

Table 4.2.5 ARDL Model Short run coefficients

Critical values are obtained from Pesaran et al. (2001). Source: Authors' computation using E-views 9

The projected short-term relationship is displayed in Table 6 above. In addition to having the predicted negative sign, the error correction coefficient (ECM(-1)), which is roughly -1.20, is statistically significant at 1% when taking into account the probability value of 0.0000. The value of the ECM(-1) suggests a reasonably rapid rate of equilibrium adjustment following shocks to the explanatory factors. About 1.2% of the disequilibria caused by the shock of the previous year converge to the long-run equilibrium in the current year. The differenced one period lag values of the log of gross domestic product for the explanatory variable demonstrate the existence of a relationship between the differenced log of gross domestic product (D(LGDP(-1)), differenced lag one of log of recurrent government expenditure (D(LRGE(-1)), differenced lag one of log of capital government expenditure (D(LRGE)), and differenced lag one of log of recurrent government expenditure (D(LRGE)).

Dependent Variable: D(LGDP)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LGDP(-1))	0.807358	0.153752	5.251028	0.0000***
D(LRGE)	0.058374	0.049762	1.173048	0.2523
D(LRGE(-1))	-0.030037	0.050945	-0.589594	0.5610
D(LCGP)	0.009825	0.038765	0.253446	0.8021
D(LCGP(-1))	0.051958	0.035028	1.483340	0.1510
D(LFGDD)	-0.058305	0.087388	-0.667189	0.5110
D(LFGDD(-1))	0.266020	0.083631	3.180861	0.0040*
C	-0.013937	0.032305	-0.431425	0.6700
ECM1(-1)	-1.012430	0.222061	-4.559236	0.0001***

Note: *** Statistical significance at 1% level; ** statistical significance at 5%;

* Statistical significance at 10%

4.2.5 Autocorrelation Test for ARDL Model

Table 4.2.6 Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.320499	**Prob. F(2,22)**	0.7291
Obs*R-squared	0.934275	**Prob. Chi-Square(2)**	0.6268

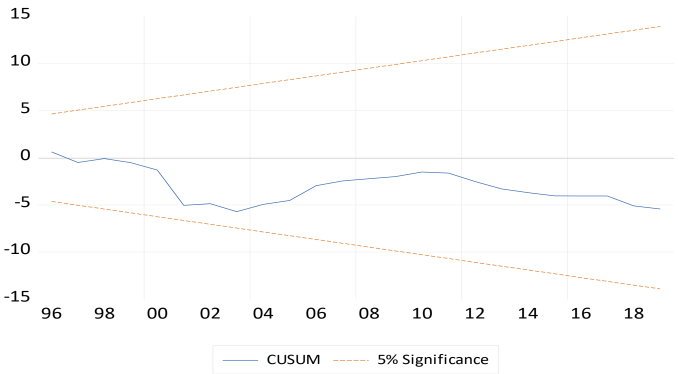
Source: Authors' computation using E-views 9

The alternative hypothesis of serial dependence among error terms is the null hypothesis, which states that there is no autocorrelation in the error terms. We conclude that this analysis's results are trustworthy and free of serial correlation because the probability of the chi-square statistics in the outcome is 0.6611(66.11%), which is greater than the 5% level of significance.

4.2.6 Stability Test of ARDL Model

The study looked at the initial ARDL model's stability tests, which show a long-term relationship between the variables employed (i.e. ARDL). The results of this study, which used the cumulative sum (CUSUM) test, are shown below.

Figure 4.5 Stability test for ARDL Model



Source: Authors computation using E-views 9

Co-integration was discovered by plotting the CUSUM statistics for the ARDL equation in Figure 3. The stability of the ARDL model is demonstrated by the fact that the CUSUM plot remains within the key 5% boundaries, confirming the long-term relationships between the variables.

4.3 Interpretation and Discussion of Findings

The results of the study's general and detailed objectives were presented in the ARDL model's long-term estimate. In other words, it provides an empirical analysis of how government expenditure has affected economic growth in Nigeria from 1970 to 2020. It demonstrates a positive association between the LGDP's first lag and its logarithm. The lag value gross domestic product (LGDP) will increase by 0.868912% for every 1% increase in the gross domestic product (LGDP).

Additionally, a 1% increase in exchange rates will result in a fall in the value of and an increase in GDP. Additionally, a statistically significant 1% increase in the initial lag value exchange rate will enhance GDP. Additionally, the value of the gross domestic product will grow with a 1% increase in inflation. Additionally, a 1% rise in the inflation rate's initial lag will boost GDP. Additionally, a 1% rise in the total amount of money in circulation will raise GDP's value. Additionally, a 1% increase in the money supply's initial lag will reduce GDP.

The R^2 determination coefficient is 0.699196. The findings indicate that changes in inflation, money supply, and exchange rates account for 70% of variations in the gross domestic product. The model is sufficient since the F-statistic, with a probability of 0.000000, is significant at 1%.

In addition to having the predicted negative sign, the error correction coefficient (ECM(-1)), which is roughly -1.2, is statistically significant at 1% when taking into account the probability value of 0.0000. The ECM's (-1) value suggests a rather rapid rate of equilibrium adjustment following shocks to the explanatory variables. About 1.2% of the disequilibria caused by the shock of the previous year converge to the long-run equilibrium in the current year. The findings from both ARDL models are therefore in line with those of Odusola (1996), Nurudeen & Usman (2010), Adewara and Oloni (2012), and others who found evidence of a substantial link between growth in economic output and factors related to government expenditure.

5.0 Conclusion and Recommendations

The relationship between government expenditure and economic growth has drawn a lot of interest from economists, both theoretically and empirically. The significance of comprehending the nature of the impact, if any, of public expenditure on economic growth cannot be overemphasized in these times when domestic and global economic growth rates are depressed and public debt is soaring as governments borrow to increase their expenditure to revive their economies.

As a result, the long-run estimate of the ARDL model was used in this project to present the findings for both the general and more detailed study objectives. In other words, it shows that there is a positive link between the gross domestic product and recurrent government expenditure. This supported research by Alexiou (2009), Al-Fawwaz (2016), and Alshahran and Alsadiq (2014) that found a favourable relationship between economic growth and ongoing government expenditure.

The results also show a positive association between GDP and capital government expenditure, but a negative relationship exists between GDP Log and the first lag of capital government expenditure. The findings of Altunc and Aydn (2013), Asghari and Heidari (2016), Attari and Javed (2013), Onifade, Cevik, Erdoan, Asongu, and Bekun (2019) are all followed by the findings of this study. Additionally, it shows that while the link between the log of the gross domestic product (LGDP) and the log of the domestic debt of the federal government

(LFGDD) is inverse, the relationship between the log of the GDP and the log of the domestic debt's first lag is positive. This finding was supported by investigations by Omodero and Alpheaus (2019) and Okwu, Obiwuru, Obiakor, & Oluwalaiye (2016). This study has been able to unravel the puzzle of what determines the size of the public sector in Nigeria. Conclusively, Government expenditure in Nigeria has some mixed results. At some points, it plays major key roles in growth but at other times it does not contribute much to economic growth. Based on this conclusion, the study recommends; recurrent government expenditure on the productive elements of the economy should be increased to have a beneficial impact on Nigeria's production growth rate; Capital investments should be used to diversify the economy, especially at this time of falling oil prices and the distribution of domestic debt financial resources must be strongly stressed, along with strong project execution supervision.

Therefore, to strengthen the fight against corruption, it is necessary to grant full independence to all anti-corruption organizations like the Independent Corrupt Practices Commission (ICPC), the Economic and Financial Crime Commission (EFCC), and others. The government is also urged to fully implement the Treasury Single Account (TSA), which was implemented by the current administration. This guarantees government revenue accountability, improves transparency and prevents the misuse of public funds. It also ensures effective cash management by removing idle monies typically held by various commercial banks and, in a sense, improves the reconciliation of revenue collection and payment.

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