

Economic Analysis of Law Review

Nigeria Economic Growth and Government Capital Expenditure, 1981-2020

Crescimento Económico da Nigéria e Despesas de Capital Governamentais, 1981-2020

Ikubor Ofili Jude¹
Ambrose Alli University (AAU)

Oladipo Abimbola Oluwaseun²
Nigerian Defence Academy (NDA)

Zakaree S. Saheed³
Nigerian Defence Academy (NDA)

RESUMO

Este estudo examinou o efeito das despesas governamentais no crescimento económico da Nigéria entre 1981 e 2020, utilizando o modelo ARDL. Os dados obtidos foram fontes secundárias, Boletim Estatístico da CBN, NBS e base de dados do Banco Mundial. A variável dependente do estudo é o Produto Interno Bruto (PIB), proxy do crescimento económico, enquanto as Despesas de Capital na Agricultura (AGEX), as Despesas de Capital na Indústria Extrativa (MGEX), foram as variáveis independentes. Os resultados das conclusões revelam que tanto a AGEX como a MGEX têm uma relação positiva com o PIB e, ao nível de significância de 5%, são estatisticamente significativas. O estudo recomenda, portanto, que, uma vez que os gastos nas áreas de instalações infraestruturas são um bom determinante do crescimento da produção, o governo deve garantir que as instalações infraestruturas básicas necessárias nestes sectores (agricultura e indústria transformadora, minas e pedreiras), tais como boas estradas, instalações de armazenamento, eletricidade estável e assim por diante, são fornecidos.

Palavras-chave: Despesas de Capital do Governo; Crescimento económico; ARDL; Nigéria.

JEL: K13; K22.

ABSTRACT

This study examined government expenditure effect on Nigeria's economic growth between 1981 and 2020, using ARDL model. The data obtained were secondary sources, CBN Statistical Bulletin, NBS and World Bank database. The dependent variable of the study is Gross Domestic Product (GDP), proxy as economic growth, while Capital Expenditure on Agriculture (AGEX), Capital Expenditure on Manufacturing, Mining and Quarrying (MGEX), were the independent variables. The results of the findings reveal that both AGEX and MGEX have positive relationship with GDP and at the 5% significant level, are statistically significant. The study therefore recommends that since spending in the areas of infrastructural facilities is a good determinant of output growth, government should ensure that basic infrastructural facilities needed in these sectors (agriculture and manufacturing, mining and quarrying) such as good roads, storage facilities stable electricity and so on, are provided.

Keywords: Capital Expenditure of Government; Economic Growth; ARDL; Nigeria.

R: 14/06/22 **A:** 22/06/22 **P:** 31/08/23

¹ E-mail: judeikubor046@gmail.com

² E-mail: Oladipoabimbola87@gmail.com

³ E-mail: zakssl@yahoo.co.uk

1. Introduction

The arguments revolving round government expenditure and growth of the economy in Nigeria has received wide publicity in both advanced and LDC. This is because of its importance in enhancing growth and development of any nation. The general view on government spending on infrastructures is that, it can enhance sustainable growth if effectively and efficiently utilized. Government expenditure serves as a catalyst for developing the economy as it supports the delivery of key public services through the constructions of social and economic infrastructures. It is through the spending that firms and citizens are connected to various economic opportunities in the areas of manufacturing, mining and quarrying, agriculture and so on (International Monetary Fund [IMF], 2020).

Furthermore, the link between Nigeria economic growth and government capital expenditure can be deduced from the Keynesian theory that recognizes roles of government intervention in ensuring sustainable development. Keynes argued that expansion in government expenditure encourages the demand for goods and services in the period of demand deficit and as well, put the unemployed back to productive activities which will support sustained inclusive growth. Economic theory asserts that public spending if properly and efficiently utilized is expected to foster economic growth and development because it will reinforce the productive base of the economy. The deployment of improved public spending practices is paramount and can play an important role for developing countries (The Economist Intelligence Unit Limited, 2020).

Globally, government expenditure is an important instrument of development. In 2016, China was ranked the 27th among 160 countries, owing to her commitment in developing infrastructural facilities that translated into growth. Between 1978 and 2008, China's capital expenditure grew by 12.3% while the real GDP increased by nine point five per cent per annum. This remarkable achievement in infrastructure contributed significantly to the growth in China's economy (Luo & Xu, 2017).

More so, most countries in Africa strive harder to allocate more funds to public spending on yearly basis so as to enhance the economic growth. In numerous LDC, government spending accounts for huge portion of total expenditure, indicating government focus in providing infrastructure (IMF, 2020). However, the efficiency of public investment depends on how it is managed. The recent study by IMF (2020) shows that 30 percent of the potential benefits of public spending are lost due to inefficiency. In Africa, for example, public expenditure is characterized by inefficient projects and flaws in the planning, allocation and execution stages (IMF, 2020).

However, in Nigeria, the trend of government capital expenditures on agriculture and manufacturing, mining and quarrying sectors shows that allocation to the sectors recorded the lowest among all the sectors in the economy (CBN, 2019). Basically, the capital expenditure on agriculture increased from 1.25 percent in 2015 to 1.82 percent in 2016. It also increased by 2.23 percent in 2018 but declined by 1.56 percent and 1.3 percent in 2019 and 2020 respectively. The government expenditure on manufacturing, mining and quarrying in 1989, 1999, 2010 and 2020 was recoded at #834.7 million, #9,923.8 million, #20.6 billion and #2,380,478.134 million respectively (Budgit, 2020).

These sectors under study (agriculture and manufacturing, mining and quarrying) are so important to the growth of the economy. For instance, agriculture sector, besides its contribution to GDP, serves as a source of revenue generation, source of food for people and employment generation. The manufacturing, mining and quarrying sector also accounts for a substantial proportion of total economic activities and create employment opportunities.

However, as part of the strategy to revive these sectors, the government has initiated various policy reforms aimed at attracting investments both locally and internationally. Some of these policies include Green Revolution Programme, Food, Road and Rural Infrastructure Directorate, National Economic Empowerment and Development Strategy, Agricultural Promotion Policy, Agricultural Transformation Agenda, were established for agricultural development and also to ensure food security in Nigeria. In the same vein, Trade and Liberalization Plan was formulated to stir competition within domestic firms and among importing and overseas firms, while the country's Minerals as well as Metals Policy was put in place to ginger a new judicial framework that promotes private sector-led growth and development (UNCTD, 2020). Owing to poor implementation of these policies and lack of appropriate funding, efforts by governments in policy formulation and programming to encourage the agriculture, manufacturing, mining and quarrying sectors have not yielded any meaningful results. At this critical time, when many businesses are folding up and unemployment is increasing, investment in the public sector is necessary so as to foster inclusive growth and development. The study tries to x-ray the effect of Nigeria economic growth and government capital expenditure. The study is divided into five segments. Segment one deals with the introduction, segment two expresses the review of related literatures, while segment three discusses methodology of the study. Data analysis and interpretation of findings are presented in segment four while summary, conclusion with recommendations for the study were discussed in segment five.

1.1 Statement of Research Problem

Nigeria as a country has huge infrastructural deficit. Most of the developed infrastructures are concentrated in the urban areas. The required infrastructures needed in the agriculture and manufacturing, mining and quarrying sectors are either non-existent or not up to the standard required to attract investments in the agriculture and for mining operations. In agricultural sector, there are problems of storage facilities, lack of industries to process agricultural output, lack of good roads to mention but a few. According to Food and Agricultural Organization (2019), about 30 to 40 percent farm produce were wasted due to lack of industries to process the produce since most agriculture produces are easily perishable. The challenges of manufacturing sector include, epileptic power supply thereby adding to costs of production, physical infrastructural deficiencies, multiple tax, high cost of imported raw materials and skilled labour. While that of mining and quarrying are low government participation, ineffective or little robust policy guidelines around mining activities, security situations around mining sites, illegal mining operations and community challenges, low funding and the attraction of new investments (African Development Bank Group [AFDB], 2020). Inadequate capital spending in the mining and quarrying sector has however, given room for illegal mining and insecurity in the mining locations. The issue of insecurity has discouraged foreign investors to invest so as to boost the nation's output through the mining and quarrying sector and also to generate employment opportunities to make lives of the citizens better-off. The fact that minerals are found in remote locations, demand for substantial infrastructure costs.

Furthermore, in the empirical literature, there is no consensus among scholars who have carried out a similar work on the subject matter. In the studies of Duruibe et al (2020); Yusuf et al (2015); Ebere and Osundina (2014), revealed that expenditures on government have positively significant effect on Nigeria's economic growth. Whereas the studies carried out by Ebong et al (2016); Kareem et al (2014) showed that expenditure on government exerts negatively insignificant impact on Nigeria's economic growth. Based on these aforementioned inconsistencies, there is need to research more on this subject area in Nigeria.

1.2 Research Questions

The following questions are relevant in the course of carrying out this research;

- i. Is there any effect on expenditure on agricultural on Nigeria's economic growth?
- ii. Does capital expenditure on manufacturing, mining and quarrying have influence on Nigeria's economic growth?

1.3 Research Objectives

- i. To determine expenditure on agriculture on Nigeria's economic growth.
- ii. To investigate whether capital expenditure on manufacturing, mining and quarrying has any influence on Nigeria's economic growth.

1.4 Research Hypotheses

Two hypotheses were treated in this study for the acceptance or rejection of the null hypotheses, so as to attain set objectives in this research work.

- i. H0: expenditure on agriculture have no significant effect on Nigeria's economic growth.
- ii. H0: capital expenditure on manufacturing, mining and quarrying have no significant effect on Nigeria's economic growth.

2. Literature Review

2.1. Conceptual Review

2.1.1. Government Expenditure

Government expenditure is defined as expenses incurred by the government for the benefit and generality of the society at large, these expenses are used to produce, maintain public goods and services in the country. It is an essential ingredient for sustainable development and growth of a nation. Jeff-Anyeneh and Ibenta (2019) defined government expenditure as the expenditure incurred on services as well as on amenities for the country.

2.1.2. Economic Growth

According to CBN (2019), economic growth is regarded as the monetary value of goods and services produced in the country annually. Nworjiet al (2012) define economic growth as the money value placed on manufactured services and goods at a given time period.

2.2. Theoretical Literature

Theory as related to this study was discussed, such theory as Solow Growth theory, propounded by Robert N. Solow in 1956. The theory emphasized that the growth of an economy depends on the threshold of savings and leftover from the present savings depend on the rate of population growth or labour-force growth and needs to be maintained by relevant resource savings level. This theory is applicable to this study because Solow studies utilized similar variables to our

study such as domestic investments, government spending, rate of capital accumulation and domestic savings. Thus, growth capacity of government and private expenditures on investments depends on the saving ability. Rise in government expenditure, tends to raise production as enabling environment would be made available for investments to thrive well. This will therefore increase the income of production agents, who in turn channels part of their revenues to savings to grow the investment base (Solow, 1956).

2.3. Empirical Literature.

Empirical literature as relates to this study are reviewed as follows. Barlas (2020) examines the impact of government capital expenditure in Afghanistan from 2004 to 2019. ARDL Model and co-integration test of Johansen were used, the results showed that government t expenditures on economic services, education, security and defence are positively significant to Afghanistan's economic growth. The study outcome could have been different if it was carried out in Nigeria. Duruibe et al (2020), examined the impact of public expenditure on Nigeria's economic growth from 1986 to 2016 using VECM analytical method. The findings revealed that all the variables (economic services, social community services, transfers) are positively significant to economic growth, except expenditure on transfers which is positive but insignificant to economic growth in Nigeria. The study is not a current literature as other economic events have overtaken its relevance and findings.

Monogbe and Okah (2017) examined government spending and economic process in Nigeria, the result shows that expenditure on service has significant impact on economic process in Nigeria. Likewise, Ifarajimi and Ola (2017) used dynamic OLS to validate the impact of government expenditure and economic growth in Nigeria. The study found that government expenditure on economic services, administration, and nominal exchange rate exerts significant impact on economic growth in Nigeria. The studies of Monogbe and Okah (2017) and Ifarajimi and Ola (2017) are criticized based on their scope. A lot of socio-economic events have taken place after the period their research covered. Another study by Ebong et al (2016) on government expenditure on economic growth in Nigeria from 1970 to 2012, applied multiple regression model, co-integration technique of Johansen and ECM to capture the long and short-run effects of the expenditures of government on agriculture, education, health on growth of the economy. The investigation revealed that government expenditure on agriculture and health were negatively insignificant, while government expenditure on education was positive and significant, they all have short-run and long-run impacts on economic growth in Nigeria. This study is criticized based on its scope because the period it covered is far long and a lot of things which need to be examined have happened and still happening.

Similarly, Yusuf et al (2015) researched on sectorial government expenditures on economic growth in Nigeria from 1984 to 2013. The study utilized ARDL technique of analysis. The outcome of the research indicates that government expenditure on agriculture was positive and has a long-run relationship with economic growth in Nigeria. Kareem et al (2014) examined the impact of public spending on economic growth of Nigeria from 1960 to 2010. The study employed OLS model of data analysis and the results conclude that government expenditure on agriculture, social community services and health all have significant impact on growth in Nigeria, while government expenditure on economic services exerts negative relationship to economic growth in Nigeria. The research covered period to 2010 which is far long and because socio-economic events during that period cannot be compared to what is happening now. Ebere and Osundina (2014) studied government expenditure on agriculture and economic growth in Nigeria from 1980 to 2012. OLS model were used and the result shows that government expenditure on agriculture is positively proportional to national output (GDP). The weakness in the methodology is that it failed to conduct a stationarity test and so, the outcome may be misleading.

2.4. Empirical Gap

Reviews extensively executed on subject but, no study has examined this impact by adding manufacturing, mining and quarrying. This study is therefore unique because manufacturing, mining and quarrying was added to the variables which has never been used in any study reviewed. The scope was as well widened to meet the contemporary trends of government expenditure in Nigeria and to update the literature on the subject.

3. Data and Methods.

3.1. Data Sources and Techniques of Estimation

The study examined impact of Nigeria economic growth and government capital expenditures from 1981 to 2020. The secondary data sourced from the CBN Statistical Bulletin, NBS and World Bank database were used. Gross Domestic Product (GDP) was proxy for national output is the exogenous variable, while capital expenditure on agriculture (AGEX) and capital expenditure on manufacturing, mining and quarrying (MGEX) are the explanatory variables. To estimate the data collected, the research employed ADF stationary test, ARDL model using Bounds test co-integration technique and Error Correction Mechanism (ECM). Decision rule for the analysis is that if the value of computed F-statistic is greater than upper bound, there is co-integration, before proceeding to analysis the long run and short run analysis of the model. In the same vein, if the value of computed F-statistics is less than the lower bound it is assumed that there is no co-integration among the variables employed. The ECM examine the speed of adjustment of the model within the shortest possible time.

3.2. Model Specification

The study is in line with the work of Yusuf et al (2015) that examines the analysis of impact of sector government expenditures on economic growth in Nigeria by including government expenditure on agriculture (AGEX) and government expenditursre on Manufacturing, Mining and Quarrying (MGEX). The study of Yusuf et al (2015) adopted the Solow's version of Neo classical model due to its core factors in influencing economic growth. The Solow model takes this form.

$$Q^g = A^g + b_1k^g + b_2L^g \dots\dots\dots 3.1$$

Where, Q^g = aggregate output rate, A^g = Total productivity factor, k^g = Capital, L^g = Labour, b_1 and b_2 are the output elasticities with respect to inputs.

The production function in equation 3.1 becomes.

$$Q_t = K_t^\beta + GeE_t^\delta + GeA_t^\theta + GeD_t^\alpha + GeTC_t^\lambda \quad 3.2$$

Thus, the functional model of Yusuf et al (2015) becomes.

$$Q_t = f(K_t^\beta, GeE_t^\delta, GeA_t^\theta, GeD_t^\alpha, GeTC_t^\lambda) \quad 3.3$$

Where, K_t is capital at period t proxy by gross capital formation, GeE_t is capital expenditure on education., GeA_t is capital expenditure on agriculture, GeD_t is capital expenditure on defense and security, $GeTC_t$ is government expenditure on transport and communication. To best suit this work, there is slight modifications in the model of Yusuf et al (2015). Some variables such as gross capital formation, capital expenditure on education, capital expenditure on defense and security and capital expenditure on transport and communication were removed. The variables were

removed because this study specifically examines the sub-sectors under economic services sector which include agriculture, manufacturing, mining and quarrying, road and constructions, transport and communication and others. Therefore, the model for this study was modified to incorporate the government capital expenditures on critical sectors such as agriculture and manufacturing, mining and quarrying, as they affect economic growth in Nigeria. Thus, the production function in equation 3.2 becomes.

$$GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 AGEX_{t-1} + \beta_3 MGEX_{t-1} + \mu_t \dots \dots \dots 3.4$$

Where the proxy for growth of the economy is GDP, AGEX is agricultural expenditure, MGEX is manufacturing, mining and quarrying expenditure, t-1 is the lagged value of the variables, μ is the stochastic error term, $\beta_0, \beta_1, \beta_2, \beta_3$ are the slopes of the coefficients.

The ECM Model for the cointegrated variables is specified thus.

$$\ln AGEX_t = \beta_0 + \sum_{i=1}^q \beta_1 \Delta \ln AGEX_{t-1} + \sum_{i=1}^q \beta_2 \Delta \ln MGEX_{t-1} + \sum_{i=1}^q \beta_3 \Delta \ln GDP_{t-1} + ECM_t + \mu_t \dots \dots \dots 3.5$$

$$\ln MGEX_t = \beta_0 + \sum_{i=1}^q \beta_1 \Delta \ln MGEX_{t-1} + \sum_{i=1}^q \beta_2 \Delta \ln AGEX_{t-1} + \sum_{i=1}^q \beta_3 \Delta \ln RGDP_{t-1} + ECM_t + \mu_t \dots \dots \dots 3.6$$

Where, ECM_{t-1} is the error correction term, Δ is the first difference operator, q is the optimal lag length.

However, for the variable which has no cointegration, the short run ARDL was employed, and it was specified thus.

Short –run ARDL Equation

$$\ln GDP_t = \beta_0 + \sum_{i=1}^q \beta_1 \Delta \ln GDP_{t-1} + \sum_{i=1}^q \beta_2 \Delta \ln AGEX_{t-1} + \sum_{i=1}^q \beta_3 \Delta \ln MGEX_{t-1} + \mu_t \dots \dots \dots 3.7$$

3.3. A priori Expectation

Parameters	Variables		Expected Relationships	Expected Coefficients
	Regressand	Regressor		
β_0	GDP	Intercept	+/-	$0 < \beta_0 > 0$
β_1	GDP	MGEX	+	$\beta_1 > 0$
β_2	GDP	AGEX	+	$\beta_2 > 0$
B_3	GDP	GDP (-1)	+	$\beta_2 > 0$

Source: Author's Regression Output.

3.4. Variable Description and Measurement

- i. Government Expenditure on agriculture: This includes all the expenditures of capital nature incurred by the Nigerian government in agricultural sector. This variable was measured in billion naira.
- ii. Government expenditure on manufacturing, mining and quarrying: This is the capital expenditure made by government on manufacturing, mining and quarrying over the period under study.

4. Data Analysis and Interpretation of Findings.

4.1. Test of Stationarity

This subsection deals with the test for unit root. Since time series data usually exhibit unit root, ADF techniques was employed to test for stationarity. The result was presented in table 1.

Table 1: Summary of the Augmented Dickney Filler (ADF) Result

Variable s	ADF Statistics	Critical Value @5%	Order of Integration	P-Value @5%	Remarks
GDP	-5.743005	-2.941145	I(1)	0.0000	Stationary
AGEX	-8.708353	-2.943427	I(1)	0.0000	Stationary
MGEX	-6.297782	-2.938987	I(0)	0.0000	Stationary

Source: Author's Regression Output

From table 1, the result of ADF test shows that ADF t-statistics, in absolute terms, are greater than the critical values at 5 percent level of significance. This implies that all the variables are stationary. However, gross domestic product (GDP) and capital expenditure on agriculture (AGEX) were stationary at first differencing while capital expenditure on manufacturing, mining and quarrying (MGEX) was stationary at level. This means that GDP and AGEX are integrated of order one I(1) while MGEX is integrated of order zero I(0). Due to this mixed order of integration, the ARDL Bounds test for cointegration was conducted. Based on the decision rule, the null hypothesis of no cointegration was rejected.

4.2. Bounds Test

The result of the ARDL bounds test for cointegration is presented in table 2. It helps to know the cointegration status of the variables after ensuring that the variables are stationary.

Table 2: Summary of Bounds Test for Cointegration Bounds Testing for Cointegration Analysis

Dependent Variables	F- Statistics @5%	LowerBound @5%	Upper Bound @5%	Cointegration	Decision
GDP	1.092581	3.79	4.85	NO	SHORT- RUN ARDL
MGEX	15.47616	3.79	4.85	YES	ECM
AGEX	7.076037	3.79	4.85	YES	ECM

Source: Author's Regression Output.

Since, there was mixed order of integration, Bounds Test was conducted to check the long-run relationships among the variables. From the result of the ARDL Bounds test presented in table 2, it is evident that F-Statistics for MGEX and AGEX are greater than the lower bounds at 5 percent level of significance. This implies that there is long run relationship among the variables, having established the long run relationship among the variables, we proceed to conduct the short run analysis, Error Correction Model (ECM) was used to check for the speed of adjustment of MGEX and AGEX variables.

4.3. Error Correction Model (ECM).

The results of the ECM Model are presented in table 3.

Table 3: Summary of Error Correction Model Result Dependent Variable: D(MGEX)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.013441	0.098322	-0.136699	0.8921
D(MGEX(-1))	0.284553	0.420064	0.677403	0.5029
D(GDP(-1))	3.676571	3.220123	1.141749	0.2618
D(AGEX(-1))	0.239387	0.115195	2.078107	0.0456
ECM(-1)	-0.876391	0.477142	-1.836750	0.0753
R-squared	0.753128	Mean dependent var		0.092079
Adjusted R-squared	0.662599	S.D. dependent var		0.319270
S.E. of regression	0.292163	Akaike info criterion		0.499071
Sum squared resid	2.816858	Schwarz criterion		0.714543
Log likelihood	-4.482345	Hannan-Quinn criter.		0.575734
F-statistic	2.796075	Durbin-Watson stat		1.917498
Prob(F-statistic)	0.041938			

Source: Author's Regression Output

Having confirmed the cointegration status of the variables, the ECM was conducted. From the ECM result in table 3, the coefficient of the intercept is -0.0013441. This implies that if all the variables are held constant, capital expenditure on manufacturing, mining and quarrying (MGEX) will be valued at 0.01. Thus, the a priori expectation is that the intercept could be positive or negative. So, it conforms to the a priori expectation. The study further showed that the coefficients of the lagged values of capital expenditure on manufacturing, mining and quarrying (MGEX), capital expenditure on agriculture (AGEX) and gross domestic product (GDP) are 0.28, 0.68 and 0.24 respectively. This shows that one percent increase in the past values of MGEX, AGEX and GDP will increase the current value of MGEX by 0.28, 0.68 and 0.24 respectively. Therefore, the past values of MGEX, AGEX and GDP have positive impact on the current values of MGEX. Thus, all the variables conform to the a priori expectation.

The coefficient of ECM which stood at -0.88 was negative as expected. This implies that any deviations from the long run equilibrium will be corrected within one year at the speed of about 88 percent. Judging from the p-values, only the coefficient of AGEX is significant at 5 percent level of significance, since the p value of 0.04 is lower than 0.05. The p values of the past values of GDP, MGEX and ECM which stood at 0.26, 0.56 and 0.07 respectively, are all greater than 0.05, meaning the variables are not statistically significant with the current value of MGEX.

The R^2 of 0.753 shows that about 75 percent variations in the current value of MGEX are explained by the past values of GDP, MGEX and AGEX, while the remaining 25 percent is captured in the stochastic error term. The F-Statistics which is 2.796 also shows that the variables are jointly significant because the value of F-calculated is greater than the value of F-tabulated. Thus, the null hypothesis of no significance is rejected. The Prob(F-Stat) also supports the rejection of the null hypothesis of no significance in the model. The Durbin-Watson d test which is approximately 2 suggests that there is no autocorrelation in the model.

Table 4: Summary of Error Correction Model (ECM) -Short Run Analysis for AGEX

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.073352	0.096532	-0.759868	0.4527
D(AGEX(-1))	0.108898	0.219469	0.496191	0.6230
D(GDP(-1))	5.476634	3.637129	1.505757	0.1416
D(MGEX(-1))	0.288775	0.223755	1.290584	0.2058
ECM(-1)	-1.051555	0.308864	-3.404583	0.0018
R-squared	0.415389	Mean dependent var		0.054847
Adjusted R-squared	0.344528	S.D. dependent var		0.457129
S.E. of regression	0.370098	Akaike info criterion		0.971980
Sum squared resid	4.520086	Schwarz criterion		1.187452
Log likelihood	-13.46762	Hannan-Quinn criter.		1.048643
F-statistic	5.861960	Durbin-Watson stat		2.077275
Prob(F-statistic)	0.001118			

Source: Author's Regression Output.

Table 4 shows the result of ECM for AGEX. From the result, all the variables have positive relationship with AGEX. The coefficients of the past values of AGEX, MGEX and GDP stood at 0.28, 3.68 and 0.24 respectively. This implies that one percent increase in the past values of AGEX, MGEX and GDP will increase the current value of AGEX by 0.28, 3.68 and 0.24 respectively. The p values however show that all the variables are statistically insignificant during the period under study. The coefficient of ECM which is -1.05155 has the expected sign. This indicates the departure from long run equilibrium which is caused by short run shock is corrected for at an adjustment speed of 1.05 percent.

The R^2 shows that 42 percent variations in the AGEX are explained by the past values of AGEX, MGEX and GDP. The F-Statistics of 5.86 implies that the variables are statistically significant at 5 percent level of significance. More so, the Durbin-Watson statistic of 2.077 indicates that the model is free from autocorrelation.

4.4. Short-Run ARDL Model

This sub-segment reveals the result of the Short-Run ARDL approach on GDP since the null hypothesis of no co-integration was rejected for the variable (GDP). The result is therefore, presented in table 5.

Table 5: Summary of Short-Run ARDL Result Dependent Variable: GDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.186485	0.888661	1.335138	0.1905
D(GDP(-1))	0.725911	0.206822	3.509836	0.0013
D(AGEX(-1))	0.021962	0.050705	0.433134	0.6676
D(MGEX(-1))	0.024602	0.054521	0.451248	0.6546
R-squared	0.862894	Mean dependent var		4.472963
Adjusted R-squared	0.851142	S.D. dependent var		0.245525
S.E. of regression	0.094728	Akaike info criterion		-1.778690
Sum squared resid	0.314072	Schwarz criterion		-1.608068

Log likelihood	38.68445	Hannan-Quinn criter.	-1.717472
F-statistic	73.42588	Durbin-Watson stat	1.979693
Prob(F-statistic)	0.000000		

Source: Author's Regression Output.

From the result in table 5, the coefficient of the intercept is 1.186. it is positive but statistically insignificant since the p value (0.1905) is greater than 0.05 critical level. This implies that when all the explanatory variables capital expenditure on agriculture (AGEX (-1)), capital expenditure on manufacturing, mining and quarrying (MGEX (-1)) and gross domestic product (GDP(-1)) are held constant, the current value of gross domestic product (GDP) will be 1.186.

The coefficient of the past values of GDP, AGEX and MGEX are 0.73, 0.02 and 0.02 respectively. These show positive relationships, and it implies that one percent increase in the past values of GDP, AGEX and MGEX will increase the current value of GDP by 0.73, 0.02 and 0.02 respectively. However, the p values for AGEX and MGEX are greater than 0.05 and less than 0.05 with GDP.

Going by the result, R^2 of 0.86 shows that 86 percent value of the dependent variable is explained by the variations of the independent variables. Looking at the Durbin-Watson statistic, which is 1.97, it shows that the model is free from autocorrelation.

4.5. Post-Estimation Diagnostic Tests

This subsection deals with some diagnostic tests required to check for the reliability and robustness of the data. The tests include heteroscedasticity and stability tests.

Table 6: Heteroscedasticity Test: Breusch-Pagan-Godfrey

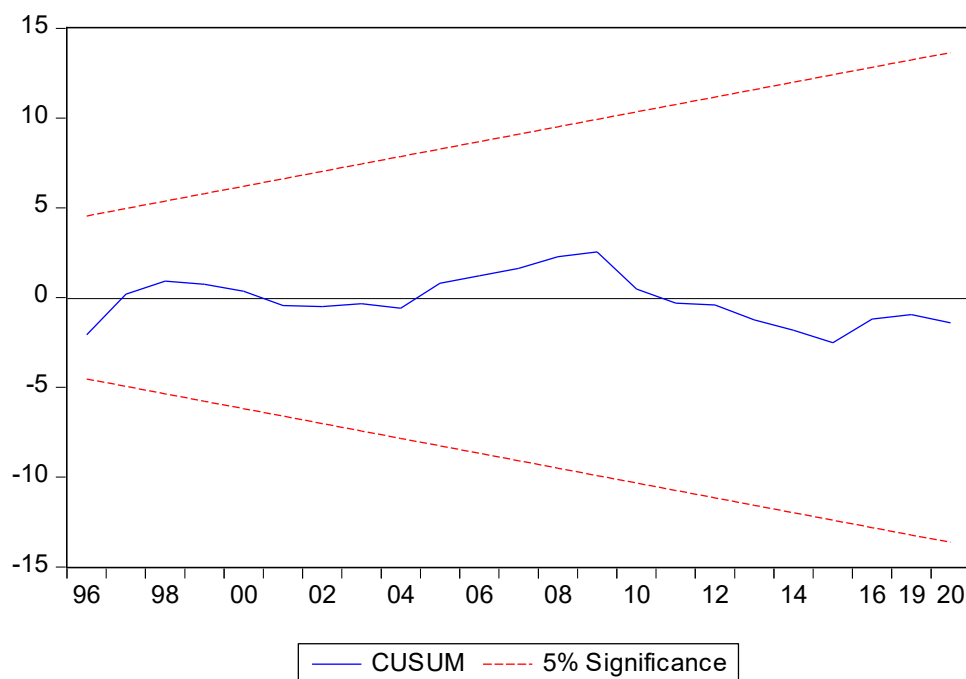
F-statistic	1.002601	Prob. F(3,35)	0.4032
Obs*R-squared	3.086323	Prob. Chi-Square(3)	0.3785

Source: Researcher's Computation Using Eviews 10

It is necessary for the time series data to pass through heteroscedasticity test so as to ensure that the mean and variance are constant over time. In this study, Breusch-Pagan-Godfrey was used. From the result of the heteroscedasticity test in table 6, the F-Statistics and Obs*R-squared values of 1.0026 and 3.086 with p values of 0.403 and 0.379 respectively, indicates that the model is free from heteroscedasticity, meaning that the residuals are homoscedastic, because the F-Statistics and Obs*R-squared with their p values are greater than the critical values at 5 percent level of significance. The null hypothesis is therefore accepted.

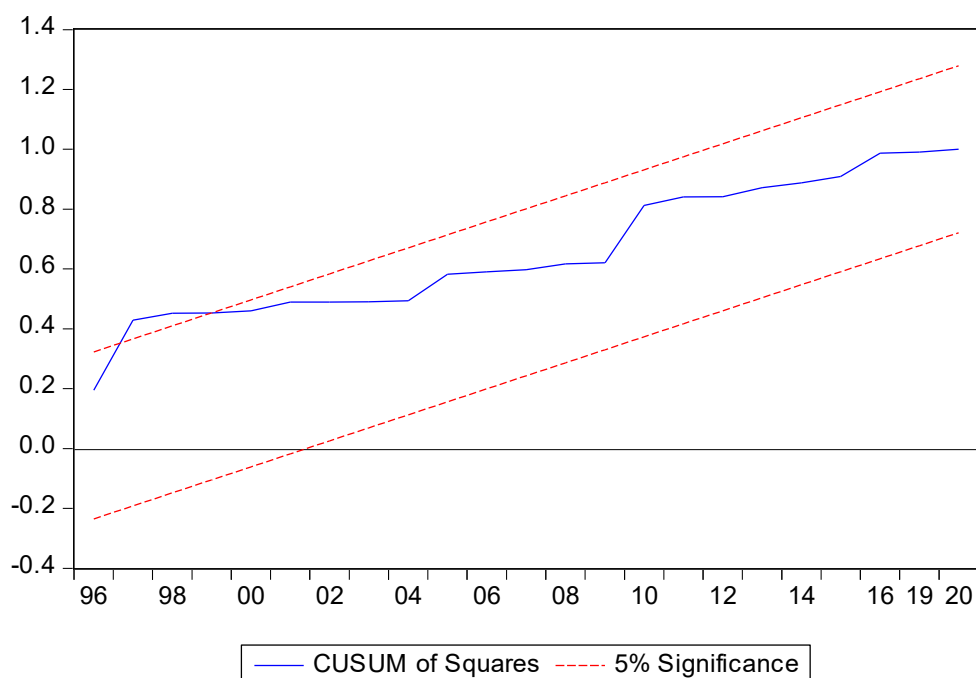
4.5.1. Stability Tests

Figure 1: CUSUM Test



Source: Researcher's Computation Using Eviews 10

Figure 1: CUSUM of Squares Test



Source: Researcher's Computation Using Eviews 10

5. Summary, Conclusion and Recommendations.

The study examined the relationship between government economic growth and government capital expenditure from 1981 to 2020. The study employs ARDL and ECM to research on the existence of long and short run relationships between the variables. The result of the stationarity tests shows that GDP and AGEX are first difference level stationary while MGEX

shows stationarity at level. Based on this mixed order of integration, ARDL Bounds test for co-integration was employed. The result indicates that there is long run relationship between the dependent variable and the independent variables. The ECM outcome, the result of the coefficient of ECM is found to be statistically significantly negative with the speed of about 1.051 percent of long run disequilibrium adjusted within the shortest possible time. The coefficients of the lagged values of GDP, AGEX and MGEX are all positive but statistically insignificant in the short run.

Specifically, one percent increase in the lagged values of GDP, AGEX and MGEX will increase the current value of GDP by 0.73, 0.021 and 0.024 percent respectively in the short run. The p values of the variables show that only the lagged value of GDP is significant at 0.05 level while other variables (AGEX and MGEX) are statistically insignificant at 0.05 levels of significance since the p values are greater than the chosen confidence level. The F-Stat shows that the variables are jointly significant with F-Stat of 73.43 which is greater than the F-tabulated.

From the foregoing outcomes, the below recommendations are suggested:

- i. National decision makers should ensure that government spending in these sectors is properly monitored for efficient and effective implementation. This could be done by setting up a monitoring committee that will oversee projects execution.
- ii. Government should provide basic infrastructural facilities needed in these sectors since they are good determinants of output growth in Nigeria.

6. Referências

African Development Bank Group (2020). *An infrastructure action plan for Nigeria: Closing the infrastructure gap and accelerating economic transformation*. <http://www.afdb.org/en/countries/Western-africa/Nigeria/infrastructure-and-growth-in-Nigeria-an-action-plan-for-strengthened-recovery/>

Barlas, A.W. (2020). The impact of government expenditure on economic growth in Afghanistan. *Journal of Economics and Business*, 3(2), 729-733.

Budget (2020). *2020 Budget analysis and opportunities*. <https://www.yourbudget.com>

Central Bank of Nigeria (2019). *Economic report fourth quarter*. <https://www.cbn.gov.ng>.

Duruibe, S.C., Chigbu, E.E., Ejazube, E.E. & Nwauwa, P.G. (2020). An evaluation of public expenditure and economic growth in Nigeria using sectoral economic function approach. *European Scientific Journal*, 16(7), 142-156.

Ebere, C. & Osundina, K.C. (2014). Government expenditure on agriculture and economic growth in Nigeria. *International Journal of Science and Research*, 3(9), 188-193.

Ebong, F., Ogwumike, F., Udongwo, U. & Ayodele, O. (2016). Impact of government expenditure on economic growth in Nigeria: A disaggregated analysis. *Asian Journal of Economics and Empirical Research*, 3(1), 113-121.

Food and Agriculture Organization (2019). *World food and agriculture: Statistical pocketbook 2019*, Rome. <https://www.fao.org>

Ifarajimi, G.D. & Ola, K.O. (2017). Government expenditure and economic growth in Nigeria. An analysis with dynamic OLS. *International Journal of Academic Research in Business and Social Sciences*, 7(5), 8-25.

International Monetary Fund (2020). WELL SPENT: How strong infrastructure governance can end waste in public investment. Doi: [Http://Dx.Doi.Org/10.5089/9781513511818.071](http://dx.doi.org/10.5089/9781513511818.071)

Jeff-Anyeneh, S.E. & Ibenta, S.N. (2019). Government expenditure and economic growth: Evidence from the Nigerian economy (1981-2016). *Advances in Research*, 19(4), 1- 14.

Kareem, R.O., Bakare, H.A., Ademoyewa, G., Bashir, N.O, Ologunla, S.E. & Ariye, R. (2014). The impact of public sector spending on economic growth of Nigeria. *Journal of Economics and Sustainable Development*, 5(3), 216-223.

Loto, M.A. (2012). Impact of government sectoral expenditure on economic growth in Nigeria. *Journal of Economics and International Finance*, 3(11), 646-652.

Luo, X. & Xu, X. (2018, August). *Infrastructure, value chains and economic upgrades. World Bank Policy Research Working Paper 164*. WBG. <https://www.xluo@worldbank.org/poverty>

Monogbe, T.G. & Okah, O.J. (2017). Government spending and economic process in Nigeria. *Frontiers of Accounting and Finance*, 2(1), 1-9).

Nworji, I.D., Okwu, A.T., Obiwuru, T.C. & Nworji, L.O. (2012). Effects of public expenditure on economic growth in Nigeria: A disaggregated time series analysis. *International Journal of Management Sciences and Business Research*, 1(7), 1-15

Pesaran, M.H. & Shin, Y. (1998). An autoregressive modelling approach to cointegration analysis. *Econometric Society Monographs*, 31, 371-413.

Solow, R.M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70, 64-94.

The Economists Intelligence Unit (2020). The future of public spending: Why the way we spend is critical to the sustainable development goals. London. <https://www.unops.org>

United Nations Conference on Trade and Development (2020). World investment report 2020. International production beyond the pandemic, United Nations. <http://unctad.org/tnc>

Yusuf, S.A., Babalola, B.T.A., Aninkan, O.D. & Salako, M.A. (2015). Analysis of impact of sectoral government expenditures on economic growth in Nigeria: Bound test cointegration approach. *European Journal of Business and Management*, 7(12), 171- 184.