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Research Article

Government Sectoral Expenditures, Economic Growth and Development in Nigeria

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Abstract
This study examined the impact of government sectoral expenditures on economic growth and development in Nigeria from 1986 to 2022. GDP was used to measure economic growth, while the United Nations Human Development Index was used to measure economic development. The data was obtained from Central Bank of Nigeria Statistical Bulletin (2022) and United Nations Human Development Report (various issues). The analysis was carried out using autoregressive distributed lag (ARDL) regression technique. The study revealed that government expenditures on education has negative and significant impact on economic growth in Nigeria, but has positive but insignificant impact on economic development in Nigeria. The result also indicated that government expenditures on health has positive and significant impact on economic growth in Nigeria, but has negative and insignificant impact on economic development in Nigeria. However, government expenditures on agriculture and government expenditures on infrastructure have negative and insignificant impact on economic growth and development in Nigeria over the period investigated. Based on the empirical results, the study concluded that government sectoral expenditures have not significantly contributed to economic growth and development in Nigeria as expected. Therefore, the researcher recommended that the government should adopt a balanced-growth strategy in the development of the education, health, agriculture and infrastructure sectors in Nigeria. The simultaneous development of these sectors is crucial to addressing the immediate challenges of the Nigerian economy. If Nigeria must grow and develop, these four sectors must be given greater attention in the budgetary allocation of the government for the next decade.
Keywords: Economic Development, Economic Growth, Government Expenditures, Human Development Index and Infrastructures.

1. Introduction

Over the years, government spending in Nigeria, which is considered the cornerstone of funding for real sectors, has continuously failed to live up to expectations. For example, a 2022 World Bank research found that Nigeria's public spending on agriculture accounted for a mere 2 percent of the country's yearly federal budget expenditures. Comparing this to other developing nations like Kenya (12%), Brazil (18%), and the 10 percent target set by the African Leaders Forum under the Comprehensive Africa Agricultural Development Programme (CAADP) in the present decade, it is far less than what is expected by international standards. The country's GDP is negatively impacted by the amount of money the government is spending on these important areas (Bernard, 2019).

The importance of government expenditures in accelerating economic growth and development has received enormous attention by government of developing countries since the Keynesian expositions in 1936. According to this expositions government expenditure raise national product, reduces unemployment and promote economic growth through the multiplier effect (Jhingan, 2009). It also has the effect of raising increasing consumption and investment expenditure of citizens through increased disposable income and savings. According to the Central Bank of Nigeria (2022) government expenditure is broadly categorized into expenditure on administration, social and community services, economic services and transfers. Government all over the world usually spends on national security and defence, education, health, agriculture, infrastructure, public debt servicing and pensions and remunerations. Recently, scholars and policy makers have focused their attention on the impact of government expenditure on economic growth in Nigeria (Obi *et*

al., 2020; Aluthge *et al.,* 2021; Amadi and Odu 2022). The reason for this interest is as a result of the perceived importance of government expenditures in promoting economic growth in less developed regions of the world (Ayeni and Omobude, 2018; Aworinde and Akintoye, 2019).

In many developing countries like Nigeria, education and health is regarded as a panacea for economic growth and development. Consequently, global institutions such as the World Health Organization, UNESCO, World Bank, and United Nations have continued to call on the governments of developing nations to allocate more funds for health and education as a prerequisite to enhancing the human capital that will accelerate sustainable economic growth and development (World Health Organization, 2022). Studies revealed that Economic growth and development depend heavily on health and education because they produce the trained labor required to accomplish other development goals (Odior, 2011; Ojo and Ojo 2022; Chima and Yusuf, 2023). Increase investment in human capital is necessary to develop a pool of skilled and healthy labour with the potential of promoting economic growth and development.

Human capital, together with physical capital, is key components of a country's growth and development. As a result, governments of third world countries across the universe have made effort to develop human and physical capital by increasing government expenditures on education, health, and infrastructure. In order to finance the productive sectors with infrastructure and high-quality human capital investment as the top priorities, the Federal Government of Nigeria has demonstrated on several occasions through its annual budget allocations that it is willing and ready to do so. This is anticipated to result in economic growth and development. This is because sustained economic growth with trickle-down effect is the bedrock for economic development. This trickle-down effect relies on government expenditure key sectors that have the potentials for human capital development and eradication of absolute poverty. Key infrastructural development in sectors such as, sanitation, health, education, transportation, agriculture, power, etc. are crucial in this development agenda (Jumare *et al.,* 2016).

The federal government of Nigeria increased its expenditure from 17,557.4 billion naira in 2020, to 19,965.3 billion naira in 2021, an increase of 13.7%. Government expenditures continued to increase throughout 2022 and 2023 to 22,431.21 billion naira and 24,431.21 billion naira respectively. Despite this increase, economic growth has not had a commensurate increase. GDP growth which stood at 5.2% in the year 2000, fell to -1.79% in 2020 culminating in economic recession. By 2022 GDP growth rate was 3.25% (World Bank, 2022). The erratic nature of the economic growth in Nigerian, despite increase in government expenditure, has raised questions as to the impact of government sectoral expenditure on economic growth and development in Nigeria. Therefore, this study specifically investigated the impact of government sectoral expenditures on economic growth and development in Nigeria from 1986 to 2022.

2. Literature Review

2.1. Conceptual Literature

2.1.1. Concept of Economic Growth

A country's output increasing over time is referred to as economic growth. It is the gradual rise in the monetary worth of products and services generated in a nation. It is typically understood to represent a rise in a nation's capacity for production over time. Economic growth, according to Nnanna *et al.,* (2004) is the capacity of a nation to raise its output of goods and services over time while utilizing its capital stock and other economic factors. Numerous indices, including the gross domestic product, gross national product, per capita income, and others, are typically used to measure economic growth.

2.1.2. Concept of Economic Development

Economic development according to Michael and Stephen (2011) refers to an increases in per capita income of a country, that will bring about the attainment of a high standard of living over a period of time. According to Todaro and Smith (2020) economic development is a multifaceted process that includes significant adjustments to institutions, popular beliefs, and social structures in addition to higher economic growth and lower rates of inequality and poverty. Economic development means economic growth plus change. It is the process by which the fruit of growth in GDP trickle-down to the citizens in the form of improved welfare, reduced poverty and inequalities, greater opportunities, higher standard of living, lower infant and maternal mortality rate, higher life expectancy and greater social and economic freedom. If all these changes have not taken place in the lives of the people, we cannot say that there is development even if GDP doubles. The generally acceptable measure of economic development is the United Nations Human Development Index (HDI). The United Nations incorporates different indicators such as social, economic and environmental indicators in calculating the HDI of a country. The HDI ranges from 0 to 1, where HDI close to

1 represent higher levels of economic development and HDI close to 0 represent low levels of economic development.

2.1.3. Government Sectoral Expenditure

Government sectoral expenditures refers to government spending in the development of various sectors through its budgetary allocation and other means of financing. Usually, government spends money on education, infrastructure, health, agriculture, power, sanitation, defence etc. Government spending on education includes funding for colleges, universities, and other public and private educational institutions. Public education spending comprises funds allocated by the government to educational institutions, education management, and educational subsidies for individuals, families, and other private entities (Nikiforos, 2021). The money that the government spends on various sectors to boost their output and productivity, which accelerates economic growth is referred to as sector expenditure. Furthermore all of the funds that the government allots to these industries fall under the umbrella of government sector expenditures. This covers the money needed for various initiatives, such as grants and subsidies, policies, and programs.

2.2. Empirical Literature

Numerous academic works have conducted empirical research on how government spending affects economic growth. These literary works have taken distinct stances when approaching this analysis. Shaliza *et al.,* (2022) looked at how government spending affected Malaysia's economic expansion. From 1980 to 2020, the development expenditure, healthcare, education, and gross fixed capital formation are the independent variables. The analysis found that although education, healthcare, and gross fixed capital creation had negative significant effects on Malaysia's economic growth, development expenditure had a positive and substantial influence.

Keçili (2022) looked into how Turkey's economic growth was impacted by health spending. Time series data spanning 43 years, from 1975 to 2021, were used in the study. Utilizing the vector auto-regressive (VAR) model, the analysis was performed. The findings of the Granger causality test showed a short-term, unidirectional causal relationship between health spending and economic growth. The importance of investments in healthcare services in Turkey is demonstrated by the existence of a short-run association between health spending and economic growth as well as a long-term relationship among related factors.

In 28 EU nations, Armeanu *et al.,* (2018) examined the factors influencing sustainable economic growth. Regression models with panel data were used in the study. The results showed a positive relationship between sustainable economic growth over the studied time and the amount spent on each student in higher education and conventional 18–22 year old pupils. But graduates in science and technology have a negative effect on real GDP growth.

Chima and Yusuf (2023) looked at the relationship between education spending and Nigeria's economic growth from 1980 to 2019. The auto regressive distributed lag (ARDL) model was utilized. The findings showed that both short and long term economic growth rates were positively impacted by health, capital investment in education, and ongoing education spending. On the other hand, over time, the rates of exchange, inflation, and gross capital formation had a negative impact on the rate of economic growth. Short term effects of the inflation rate, exchange rate, and gross capital formation on economic growth were negative.

From 1980 to 2016, Onoja *et al.,* (2020) looked at how government spending affected education and educational development in Nigeria. For the analysis, the study used econometric and statistical methods. The results showed that depending on the development element under investigation, the long-term effects of public spending on educational development differed. Furthermore, recurrent government spending on education had a minimally beneficial influence on all indicators, whereas capital government spending on education had a positive and considerable impact. Ultimately, the findings showed that there was no discernible long term relationship between educational spending and the quality of education in Nigeria.

Yerima *et al.,* (2022) examined how government spending affected Nigeria's economic growth between 1986 and 2020. The pairwise causality test and the structural vector auto-regression (SVAR) model were used in the investigation. The findings indicated that the influence of government spending on health and education on Nigeria's economic growth was negligible. The study also showed that, over the examined time, public debt had no discernible effect on economic growth. From 1987 to 2019, Kenechukwu and Udoka (2021)

examined the relationship between government spending and economic growth in Nigeria. The data was analyzed using the multivariate model and ordinary least squares regression techniques. The study's conclusions showed that government spending on agriculture had a major and favorable impact on Nigeria's economic growth.

Aluthge *et al.,* (2021) examined how government spending affected economic expansion between 1970 and 2019. The autoregressive distributed lag (ARDL) model is utilized in the study for data analysis. The study's main conclusions were that capital expenditures have a positive and considerable influence on economic growth over the long term, while recurring expenses have little to no effect on growth over the short and long terms.

Agbana and Ebisine (2021) looked at how government spending on agriculture affected Nigeria's economic expansion. The data was analyzed using the ordinary least squares regression technique in this study. The results showed that government spending on agricultural and agricultural credit guarantee plan funds significantly and favorably affects Nigeria's economic growth.

Matthew and Modecai (2016) investigated how Nigerian agricultural output was affected by public agricultural spending between 1981 and 2014. The Granger causality test and the error correction mechanism (ECM) were used in the investigation. The findings showed that government spending on agriculture significantly and negatively affects agricultural productivity. The study came to the conclusion that differences between the amounts allotted to and actually spent on the agricultural sector of the economy could be the cause of the negative effects.

Rahman and Bassey (2018) looked into how government spending affected Nigeria's health sector's performance between 1980 and 2015. The data analysis in the study made use of the error correction mechanism (ECM). The findings showed that government spending on the health sector was inversely correlated with life expectancy and literacy rate. According to the report, in order to raise the performance of Nigeria's health system, the government should spend more on healthcare. Ibrahim *et al.,* (2023) looked at how government spending affected Nigeria's infrastructure growth between 1986 and 2022. The data in the model was analyzed using the ordinary least squares (OLS) estimation technique in this study. According to the OLS result, government spending in Nigeria has a favorable effect on the advancement of the country's transportation, health, and educational systems.

2.2.1. Gap in Literature

From the literature review, it can be clearly seen that previous studies on the impact of government sectoral expenditures on economic growth, have empirically focused on economic growth and aggregate government expenditure relationship. While some have disaggregated government expenditures into recurrent and capital expenditures in their analysis, others have focused on economic growth and specific sector perspective. This study intends to fill the gap in the literature by looking into the effects of government expenditures on economic growth by disaggregating government expenditure into different sectors, thereby offering a holistic and comparative analysis of how government expenditures on each sector have impacted economic growth in Nigeria. Also, this study seeks to fill the gap in literature by analysing the economic development impact of government expenditures, by introducing an economic development indicator (Human Development Index) which no previous study has done.

3. Research Methods

3.1. Theoretical Framework

The Wagner law, commonly known as the growing public expenditure theory (PET), serves as the theoretical foundation for this investigation. Adolph Wagner (1835–1917) is credited with creating the Wagner law. It is explained by the premise that as economic development proceeds, the proportion of government spending to GDP rises over time. According to this, when a nation's income grows, public spending must also grow continuously. As a result, the four guiding principles of the theory are as follows: (a) Growth raises complexity since it brings with it fresh and ongoing increases in public spending. (b) Externalities and urbanization are the results of rising public spending. (3) There should be a significant income elasticity of demand for goods provided by the public sector. (4) Growth causes demand to rise, which has the effect of increasing public expenditures. This suggests that maintaining the smooth operation of economic activity is the government's social responsibility. Because of the many objectives of the government and other stakeholders in the economy, efficiency and equality should thus direct public spending in order to prevent anarchy. Efficiency is the appropriate management of governmental activities in the economy. It includes the

planning, gathering, and supervision of government revenue and spending in order to provide social services to the economy's stakeholders. Contrarily, equity emphasizes the equitable distribution of advantages made by the public among all parties involved (Cosimo *et al.,* 2015; Magazzino *et al.,* 2015; Babatunde, 2018). In summary, Wagner law posits that augmenting government spending will help foster economic expansion and advancement within a nation.

3.2. Model Specifications

The model adapted for this study is that of Aluthge *et al.,* (2021) in their investigation of the effect of government spending on economic growth in Nigeria. Their model was specified as follows:

$$GDP = (CAP, LF, REC, TPN, INF, NOILR) \quad (3.1)$$

$$GDP = \beta_0 + \beta_1 CAP + \beta_2 LF + \beta_3 REC + \beta_1 TPN + \beta_2 INF + \beta_3 NOILR + e_t \quad (3.2)$$

Where: GDP = Gross domestic product, CAP = Capital expenditure, LF = Labour force, REC = Recurrent expenditure, TPN = Trade openness, INF = Inflation, NOILR = Non-oil revenue and e_t = error term.

From Aluthge *et al.,* (2021) model, the model of this study is modified by disaggregating government expenditure into government expenditure on education, government expenditure on health, government expenditure on agriculture and government expenditure on infrastructure. This approach seeks to provide valuable insights for policymakers on how government expenditures on different sectors contribute to economic growth and development in Nigeria. The findings will guide resource allocation and policy formulation to improve the overall performance of the Nigeria economy and will help to identify which areas require more investment to promote economic growth and development effectively. Therefore, the model for this study is stated as:

Model I: Economic Growth Model

$$GDP = f (GEE, GEH, GEA, GET GEC) \quad (3.3)$$

Model 2: Economic Development Model

$$HDI = f (GEE, GEH, GEA, GEI) \quad (3.4)$$

The econometric form of these models is stated as:

$$GDP = \beta_0 + \beta_1 GEE + \beta_2 GEH + \beta_3 GEA + \beta_4 GEI + u_t \quad (3.5)$$

$$HDI = \alpha_0 + \alpha_1 GEE + \alpha_2 GEH + \alpha_3 GEA + \alpha_4 GEI + \varepsilon_t \quad (3.6)$$

A' priori expectation: $\beta_0 <>, \beta_1, \beta_2, \beta_3 \& \beta_4 > 0$ and $\alpha_0 <> 0$ $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \& \alpha_5 > 0$

Where: GDP = Gross domestic product, HDI = Human development index, GEE = Government expenditure on education, GEH = Government expenditure on health, GEA = Government expenditure on agriculture, GEI = Government expenditure on infrastructure (proxied by government expenditure on transportation and communication), β_0 = intercept, $\beta_1, \beta_2, \beta_3 \& \beta_4$ = economic growth model parameters, α_0 = intercept and $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \& \alpha_5$ = Economic development model parameters and u_t and ε_t = Stochastic terms.

3.3. Sources of Data

The aim of this study is to empirically examine the impact of government sectoral expenditures on economic growth and development in Nigeria. The data set for the study consist of annual time series from 1986-2022 and they are obtained from Central Bank of Nigeria Statistical Bulletin (2022) and the United Nations Human Development Report (various issues).

3.4. Method of Data Analysis

This study employs the auto regressive distributed lag technique developed by Pesaran *et al.,* (2001) to estimate the parameters in the model. The ARDL model has been proved to perform better on variables that are either $I(1)$ or $I(0)$ or combination of the two and the approach yields unbiased estimates and its t-statistics are efficient (Harris and Sollis, 2003). Thus, we specified the reduced form of the ARDL model in equation (3.7)

$$Y_t = \gamma_{0i} + \sum_{i=1}^{p} \delta_i Y_{t-i} + \sum_{i=0}^{q} \beta_i' X_{t-1} + \varepsilon_t \quad (3.7)$$

Where Y_t is a vector of the dependent variables, X_{t-1} is a vector of the lag values of the independent variables which are expected to be purely $I(0)$ or $I(1)$ or combination of both and also co-integrated. δ and β are coefficients, γ is the intercept, i=1,…,k, p and q are optimal lag orders. ε_t is a vector of the error terms–unobserved zero mean white noise vector process (serially uncorrelated or independent).

Given that the independent variable are expected to be co-integrated, we specify both the long-run and short-run ARDL model.

The long-run ARDL model is specified as:

$$\Delta \ln GDP_t = \alpha_0 + \alpha_1 GDP_{t-1} \alpha_2 \ln GEE_{t-1} + \alpha_3 \ln GEH_{t-1} + \alpha_4 GEA_{t-1} + \alpha_5 \ln GEI_{t-1} + \sum_{i=0}^{n} \theta_{1i} \Delta \ln GEE_{t-1} + \sum_{i=0}^{n} \theta_{2i} \Delta \ln GEH_{t-i} + \sum_{i=0}^{n} \theta_{3i} \Delta \ln GEA_{t-i} + \sum_{i=0}^{n} \theta_{4i} \Delta \ln GEI_{t-i} \quad (3.8)$$

The short-run ARDL model is specified as

$$\Delta \ln GDP_t = \theta_0 + \sum_{i=0}^{n} \theta_{1i} \Delta \ln GEE_{t-1} + \sum_{i=0}^{n} \theta_{2i} \Delta \ln GEH_{t-i} + \sum_{i=0}^{n} \theta_{3i} \Delta \ln GEA_{t-i} + \sum_{i=0}^{n} \theta_{4i} \Delta \ln GEI_{t-i} + \lambda ECT_{t-1} \quad (3.9)$$

Where α_1, α_2, α_3, α_4 and α_5 are long-run coefficients of the ARDL model, α_0 and θ_0 are the constant, θs are short-run coefficients of the ARDL model while λ is coefficient of the speed of adjustment in the system and ECT denotes the error correction term.

4. Result and Interpretation

4.1. Unit Root

Table 1. Unit root test result for the variables.

Series	ADF statistics	Critical values			Order of integration
		1%	5%	10%	
GDP	-4.059469	-3.626784	-2.945842	-2.611531	$I(0)$
HDI	-6.686218	-4.243644	-3.544284	-3.204699	$I(1)$
GEE	-5.902653	-4.296729	-3.568379	-3.218382	$I(1)$
GEH	-5.471212	-4.28458	-3.562882	-3.215267	$I(1)$
GEA	-8.612614	-4.243644	-3.544284	-3.204699	$I(1)$
GEI	-6.767416	-4.252879	-3.54849	-3.207094	$I(1)$
Source: Researchers' computation using Eviews 12.					

From Table 1, the results of the ADF statistics reveals that HDI, GEE, GEH, GEA and GEI were stationary at first difference i.e. integrated at order one [$I(1)$], while GDP was stationary at levels [$I(0)$]. Hence, the null hypothesis of "no unit root exist" was rejected for all the series. This result gives the researcher enough justification to move forward with further estimation using the Johansen co-integration test for testing the long-run co-integrating relationship among the series and auto-regressive distributed lag modeling, since the order of integration of the series are in mixed order.

4.2. Lag Order Selection Criteria

4.2.1. Model One (Economic Growth Model)

Table 2. VAR lag order selection.

Lag	LogL	LR	FPE	AIC	SC	HIQ
0	-121.2279	NA	0.001446	7.650175	7.876918	7.726467
1	-0.989719	196.7534	4.59e-06	1.878165	3.238626*	2.335919
2	30.62920	42.15856	3.44e-06	1.477018	3.971197	2.316234
3	81.60143	52.51685*	9.74e-07*	-0.097057	3.530841	1.123620*
4	109.5134	20.29963	1.66e-06	-0.273541*	4.488074	1.328598

*Indicates lag order selected by the criterion
LR: Sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HIQ: Hannan-Quinn information criterion

4.2.2. Model Two (Economic Development Model)

Table 3. VAR lag order selection.

Lag	LogL	LR	FPE	AIC	SC	HIQ
0	-28.90599	NA	5.37e-06	2.054909	2.281652	2.131201
1	49.36234	128.0755	2.17e-07	-1.173475	0.186986	-0.715721
2	78.31704	38.60626	1.91e-07	-1.413154	1.081026	-0.573938
3	136.4392	59.88343*	3.51e-08	-3.420557	0.207340	-2.199880
4	180.7423	32.22041	2.22e-08*	-4.590440*	0.171175*	-2.988301*

*Indicates lag order selected by the criterion
LR: Sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HIQ: Hannan-Quinn information criterion

The result in Table 2 and Table 3 revealed that the coefficient of sequential modified LR test statistic (LR), final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HIQ). The Akaike information criterion (AIC) indicated that an optimum lag length of 4 is satisfactory for equation estimation for both models. Therefore, lag length of 4 was thereby selected as the optimum lag length for the analysis.

4.3. Johansen Co-integration Test

If there is a long-term or equilibrium link between or among two or more variables, they are said to be co-integrated (Gujarati, 2004). This suggests that throughout time, the variables or series are likely to move in the same direction and are related to one another. The number of co-integrating equations was ascertained using the maximum eigenvalue test statistic and the Johansen (1991) trace statistic. If the probability (p-value) is less than 0, the null hypothesis that there is no co-integration is to be rejected. The co-integration test's outcome is shown in Table 4.

Table 4. Cointegration test results model one (economic growth model).

Unrestricted cointegration rank test (trace)				
Hypothesized no. of CE(s)	**Eigenvalue**	**Trace statistics**	**0.05 critical value**	**Prob.****
None *	0.835244	156.8192	95.75366	0.0000
At most 1 *	0.728058	95.50732	69.81889	0.0001
At most 2 *	0.463722	51.23369	47.85613	0.0233
At most 3 *	0.343872	30.04821	29.79707	0.0468
At most 4 *	0.207405	15.72063	15.49471	0.0462
At most 5 *	0.205409	7.817563	3.841466	0.0052
Trace test indicates 6 cointegrating eqn(s) at the 0.05 level *Denotes rejection of the hypothesis at the 0.05 level **MacKinnon *et al.,* (1999) p-values				
Unrestricted cointegration rank test (maximum eigenvalue)				
Hypothesized no. of CE(s)	**Eigenvalue**	**Max-eigen statistic**	**0.05 critical value**	**Prob.****
None *	0.835244	61.31184	40.07757	0.0001
At most 1 *	0.728058	44.27363	33.87687	0.0020
At most 2	0.463722	21.18549	27.58434	0.2652
At most 3	0.343872	14.32758	21.13162	0.3387
At most 4	0.207405	7.903066	14.26460	0.3886
At most 5 *	0.205409	7.817563	3.841466	0.0052
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level *Denotes rejection of the hypothesis at the 0.05 level; **MacKinnon *et al.,* (1999) p-values				
Source: Researchers' computation using Eviews 12.				

The Johansen cointegration trace statistic in Table 4 reveals that there are at least 5 cointegrating equations among the variables at 5% level of significance. The maximum eigenvalue statistic revealed that there are no cointegrating equations among the variables at the 0.05 level of significance. However there exists a long-run relationship among the variables in the model as implied by the trace statistic result.

Table 5. Cointegration test results model two (economic development model).

Unrestricted cointegration rank test (trace)				
Hypothesized no. of CE(s)	**Eigenvalue**	**Trace statistics**	**0.05 critical value**	**Pro Prob.****
None *	0.687113	81.92327	69.81889	0.0040
At most 1	0.473261	41.25634	47.85613	0.1806
At most 2	0.268007	18.81958	29.79707	0.5059
At most 3	0.201903	7.900131	15.49471	0.4761
At most 4	0.000193	0.006742	3.841466	0.9340
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level *Denotes rejection of the hypothesis at the 0.05 level **MacKinnon *et al.,* (1999) p-values				
Unrestricted cointegration rank test (maximum eigenvalue)				
Hypothesized no. of CE(s)	**Eigenvalue**	**Max-eigen statistic**	**0.05 critical value**	**Prob.****
None *	0.687113	40.66693	33.87687	0.0067
At most 1	0.473261	22.43676	27.58434	0.1988
At most 2	0.268007	10.91945	21.13162	0.6554
At most 3	0.201903	7.893389	14.26460	0.3896
At most 4	0.000193	0.006742	3.841466	0.9340
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level *Denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				
Source: Researchers' computation using Eviews 12.				

The trace statistic in Table 5 reveals that there are at least 5 cointegrating equations among the variables at 5% level of significance. Also the maximum eigenvalue statistic revealed that there is at least 1 cointegrating equation among the variables at the 0.05 level of significance. This implies that there exists a long-run relationship between human development index (HDI) and government sectoral expenditures in Nigeria.

4.4. Long Run and Short-Run ARDL Results

Since the model is found to be co-integrated, the long run and short-run parameters of the ARDL models were estimated and the results are presented in Table 6.

Table 6. Estimated long-run and short-run result for model one (economic growth model) using ARDL.

Long-run model dependent variable: GDP			**Short-run model dependent variable: GDP**		
Regressors	**Coefficients**	**P-value**	**Regressors**	**Coefficients**	**P-value**
GEE	-0.215529	0.0135	GEE	-0.215529	0.0117
GEH	0.196372	0.0250	GEH	0.196372	0.0013
GEA	-0.006128	0.8326	GEA	-0.006128	0.07597
GEI	-0.024037	0.6345	GEI	-0.024037	0.4673
C	1.082738	0.0673	ECT	-0.024449	0.0000
R-square	0.999549	F-statistic = 1847.101 Prob. value (0.000000)	R-square	0.878612	F-statistic= 4.923894 at 5% $I(0)$= 2.56 $I(1)$= 3.49
Adj. R-square	0.999008		Adj. R-square	0.799709	
D.W	2.435808		D.W	2.435808	
Diagnostic test results					
Purpose	**Test**		**Statistic**		**Prob. value**
Normality	Jarque-Bera test		Jarque-Bera = 1.645020		0.439327
Serial correlation test	Breusch-Godfrey serial correlation LM test		F-statistic = 1.819028		Prob. F (2,13) = 0.2011
Heteroskedasticity test	Breusch-Pagan-Godfrey test		F-statistic = 1.449915		Prob. F (1,14) = 0.2361
Model specification test	Ramsey (RESET) test of model specification		F-statistic (1,23) = 0.269165		Prob. F (18,15) = 0.06120
Source: Researchers' computation using Eviews 12.					

Table 7. Estimated long-run and short-run result for model two (economic development model) using ARDL.

Long-run model dependent variable: HDI			**Short-run model dependent variable: HDI**		
Regressors	**Coefficients**	**P-value**	**Regressors**	**Coefficients**	**P-value**
GEE	0.016402	0.4215	GEE	0.011473	0.1833
GEH	-0.036301	0.1481	GEH	-0.036301	0.0336
GEA	-0.001066	0.9050	GEA	-0.001086	0.8021
GEI	-0.000832	0.9504	GEI	-0.000832	0.9079
C	0.065157	0.6248	ECT	-0.152269	0.0001
R-square	0.991956	F-statistic= 56.04982 Prob. value (0.000000)	R-square	0.905155	F-statistic=10.35063 at 5% $I(0)$= 2.56 $I(1)$= 3.49
Adj. R-square	0.974258		Adj. R-square	0.797664	
D.W	1.717515		D.W	1.717515	

Diagnostic test results			
Purpose	**Test**	**Statistic**	**Prob. value**
Normality	Jarque-Bera test	Jarque-Bera = 1.445223	0.485483
Serial correlation test	Breusch-Godfrey serial correlation LM test	F-statistic = 0.165492	Prob. F (2,8)= 0.8503
Heteroskedasticity test	Breusch-Pagan-Godfrey test	F-statistic = 0.884103	Prob. F (22,10)= 0.6157
Model specification test	Ramsey (RESET) test of model specification	F-statistic (1,23) = 2.195024	Prob. F (1,9)=0.1726
Source: Researchers' computation using Eviews 12.			

Table 6 and Table 7 present both the long-run and short run results of the ARDL estimates. It is clearly seen that government expenditures on education (GEE) have negative and significant impact on economic growth in Nigeria both in the long-run and short-run. The significance of the relationship was based on the fact that the P-value is less than 0.05 (i.e. P-value < 0.05) level of significance. However, government expenditures on education (GEE) has positive but insignificant impact on economic development in Nigeria both in the long-run and short-run. The insignificance of the relationship was based on the fact that the P-value is greater than 0.05 (i.e. P-value > 0.05) level of significance. However, government expenditures on agriculture (GEA) and government expenditures on infrastructure (GEI) have negative and insignificant impact on economic growth and development in Nigeria both in the long-run and short-run. The insignificance of the relationship was based on the fact that the P-values are greater than 0.05 (i.e. P-value > 0.05) level of significance. The result also indicated that government expenditures on health (GEH) has positive and significant impact on economic growth in Nigeria both in the long-run and short-run. The significance of the relationship was based on P-value which is less than 0.05 (i.e. P-value < 0.05) level of significance. However, government expenditure on health (GEH) has negative and insignificant impact on economic development in Nigeria both in the long-run and short-run.

The result indicates that the error correction term (ECT) of -0.024449 and -0.152269 for model 1 and model 2 respectively are correctly signed and statistically significant at 0.05 1evel of significance given that their Prob. values are less than 0.005 (i.e. P-value < 0.005). This showed that in the event of a disequilibrium resulting from a shock or disturbance, the system will restore itself back to equilibrium by an adjustment speed of approximately 2.4 percent and 15.6 percent respectively. That is if there is disequilibrium in GDP and HDI and the related components; there will be a speed of adjustment from short-run to long-run of about 2.4 percent for mode 1 and 15.6 percent for model 2. The coefficients of determination (R^2) for model 1 of the long-run and short-run results are 0.999549 and 0.974258 respectively, while that of model 2 are 0.991956 and 0.905155 respectively. This implies that 99% and 97% of the total variation in economic growth in Nigeria is explained by changes in government expenditure on real sectors in the long-run and short-run respectively, while 99% and 90% of the total variation in economic development in Nigeria is explained by changes in government expenditure on real sectors in the long-run and short-run respectively. The F-statistic of 1847.101 and 56.04982 for model 1 and 2 showed that the independent variables are jointly significant in explaining the variations in the dependent variable at 5% level of significance, because the prob. value of 0.000000 and 0.000000 are less than 0.05 level of significance.

The F-bound test for model 1 and model 2, reviews that there exist a long-run equilibrium relationship among the variables in the model since the empirical F-statistics of 4.923894 and 10.35063 for model 1 and model 2 respectively are greater than critical F-statistics at lower bound [$I(0)$] and upper bound [$I(1)$] at 5% level of significance. The Durbin Watson (DW) statistic of the model is 2.435808. Since this value is approximately 2, it implies that there is the absence of serial correlation among the successive values of the error term. Breusch-Godfrey serial correlation LM test for model 1 and 2 reveals that the successive values of the residuals are not serially correlated given that its P-values are greater than 0.05 level of significance. The Breusch-Pagan-Godfrey test of Heteroskedasticity for model 1 and 2, shows that the variance of the error term is homoscedastic, since the prob. values are greater than 0.05 (i.e. 0.8503>0.05). The Jarque-Bera statistic for model 1 and 2, with a prob. value of 0.485483 and 0.485483 respectively, indicate that the residual values are normally distributed given that the prob. values are greater than 0.05 level of significance. The Ramsey (RESET) test for model 1 and 2, reveals that the functional form of the regression models are appropriate, hence the models of the study are correctly specified. This is because the prob. values of 0.06120 and 0.1726 are greater than the 5% level of significance.

4.5. Implication of Results

Education, health, agriculture and infrastructure are fundamental instrument of economic growth and development. If a country must grow and develop, it must invest in these sectors. Both health and education are critical to well-being and are necessary for a fulfilling existence; both are crucial to the larger idea of human potential (Todaro and Smith, 2020). At the same time agriculture and infrastructure plays a crucial role in the ability of a developing country to develop the capacity for a self-sustaining growth and development. Nigeria as a country has fallen short of the development of these sectors. The regression result in Table 6 and Table 7 reveals that government sectoral expenditures are not sufficient for a sustainable economic growth and development. The impact of government expenditures on education, health, agriculture and infrastructure are expected to be positive and highly significant, but the contrary is the case for the Nigerian economy. This could be as a result of corruption, misallocation of resources, low budgetary allocation to these sectors and government's misplacement of priority. For education, health, agriculture and infrastructure to bring about sustainable economic growth and development, the Nigerian government must be committed to investing in these sectors and ensure that funds allocated to these sectors are used for the purpose for which they were approved. When funds approved for investment in education and health are diverted or looted this will retard the growth of these sectors which will definitely have an adverse effect on economic growth and development in Nigeria. This is evident in the negative impact of government expenditure on health, agriculture and infrastructure on economic growth and development in Nigeria. A study conducted by Foster and Pushak (2011) estimates that over the next ten years, consistent spending of over $14.2 billion per year will be needed to address Nigeria's infrastructure problems. This is about 140 percent higher than the current government expenditure on infrastructure. Inconsistency in government policy and programmes is another factor responsible for the inverse impact of these real sectors on economic growth and development in Nigeria. Different government creates different agenda, without considering the implication of terminating the previous policy. This attitude undermines the importance of sustained government expenditure on developing these real sectors.

4.6. Stability Test

The stability test for the models was performed utilizing cumulative sum (CUSUM) of residual and cumulative sum of squares for model 1 and 2. This is shown in Figure 1 and 2.

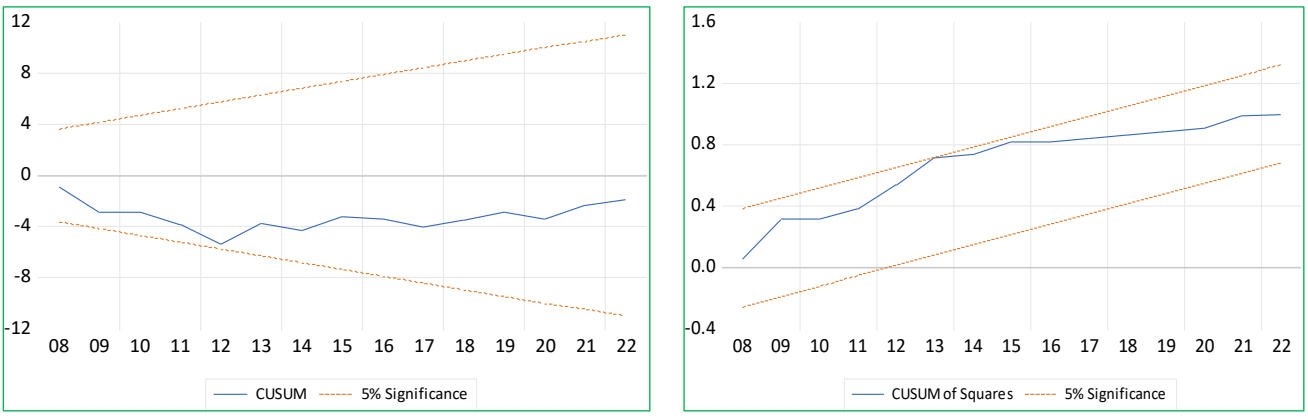

Figure 1. Plot of cumulative sum of recursive residual for model 1 (economic growth model).

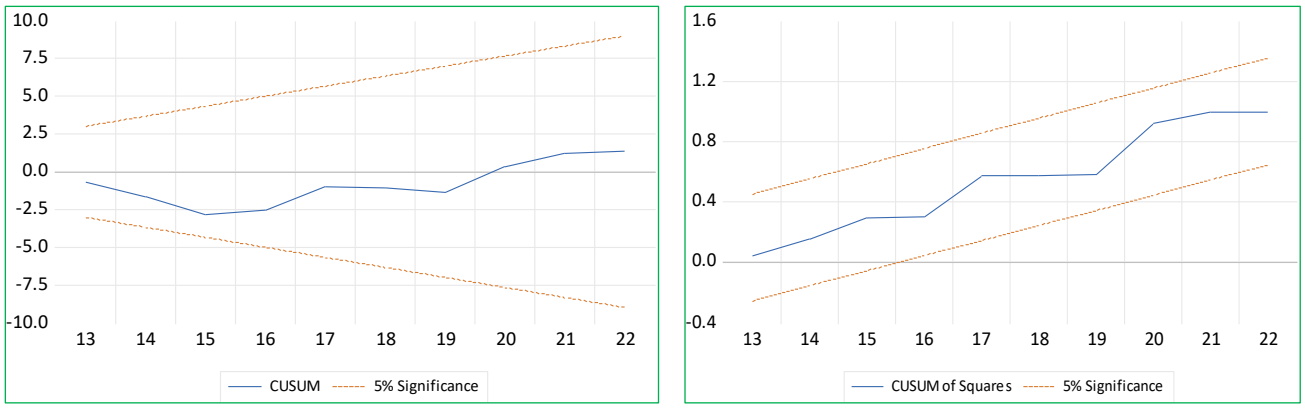

Figure 2. Plot of cumulative sum of recursive residual for model 2 (economic development model).

From Figure 1 and 2 it can be seen that the cumulative sums of the residual are within the critical (dotted) lines at 5% level of significance. Therefore model 1 and 2 are structurally stable over time and can be relied upon for policy formulation.

5. Conclusion and Recommendations

The objective of this study is to empirically examine the impact of government sectoral expenditures on economic growth and development in Nigeria using time series data for the period 1986-2022. The study employed autoregressive distributed lag (ARDL) model in estimating the parameters of the model. The study takes into account the co-integration analysis and the unit root test in order to ensure the robustness of the results. The study argues that for Nigeria to achieve a self-sustaining economic growth and development, the government must be committed to developing the education, health, agriculture and infrastructure sectors. The result of the long-run and short-run ARDL model reveals that government expenditure on these four sectors has not translated into meaningful economic growth and development in Nigeria.

Based on the empirical results, the following recommendations are made:

1) The government should adopt a balanced-growth strategy in the development of the education, health, agriculture and infrastructure sectors in Nigeria. The simultaneous development of these sectors is crucial to addressing the immediate challenges of the Nigerian economy. If Nigeria must grow and develop, these four sectors must be given greater attention in the budgetary allocation of the government for the next decade.
2) The government should adhere to the UNESCO minimum benchmark of 26% education share of total budgetary allocation for the education sector.
3) For government sectoral expenditures to have positive and significant impact on economic growth and development in Nigeria, extraneous factors like corruption and looting of public funds must be checked in order to ensure that funds allocated to these sectors are used for the purpose for which they were approved.
4) The Nigerian government should prioritize expenditures on education, health and agriculture infrastructural projects since these projects have great potentials for long-term economic growth in Nigeria.

Declarations

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