

GOVERNMENT EXPENDITURE ON HEALTHCARE, EDUCATION AND ECONOMIC GROWTH IN NIGERIA: AN AUTOREGRESSIVE DISTRIBUTED LAG MODEL (ARDL) APPROACH

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Abstract

The task of achieving sustainable economic growth has preoccupied the policy goals of modern government including Nigeria. Persistent low budgetary allocations to critical sectors such as health and education by successive government in Nigeria has continued to hamper the growth of the economy with its attendant consequences on living standard, diseases, low life expectancy, high level of unemployment and rise in multi-dimensional poverty. This study estimated the short run relationship between government spending on healthcare, education and economic growth of Nigeria. It adopted series of standard econometrics method using the Autoregressive Distributed Lag model (ARDL) to estimate the effect of government spending on healthcare and education on Nigeria's GDP as well as to estimate the short and long run relationship between government spending on health, education and economic growth in Nigeria. The result obtained was subjected to several post estimation test to confirm the robustness of the result obtained for accurate policy forecast and prediction. The result obtained from the study revealed that government spending on health has significant positive effect on economic growth. Also, government spending on education showed significant positive effect on economic growth in Nigeria. The cointegration result showed the existence of a short run relationship among the variables studied. Finally, the findings revealed a significant positive relationship between government expenditure on education and economic growth. It further indicated one per cent increase in government expenditure on education leads to 0.17 per cent increase in GDP growth. In the same vein, primary enrollment contributed significantly to economic growth; one per cent increase in school enrollment brought about 0.019 rise in Nigeria's GDP. On the other hand, the ARDL short run result obtained indicated a negative and significant relationship between government healthcare expenditure and economic growth. The study there recommends that government at all levels should step up their budgetary allocations in healthcare and education to boost productivity and quality of lives of the people.

Key words: Government spending, economic growth, ARDL, school enrollment, healthcare

Introduction

In the past four decades, Nigeria made considerable attempt to achieve sustainable growth embarked by embarking on some educational and complementary health care programmes for which the impact on the economy seems elusive. Notwithstanding, the growth of the economy for which the huge spending on critical sectors of the economy is targeted to accelerate is limping with its attendant consequences. Low life expectancy and low living standard albeit poor level of education have continued to plague this

country.

There is no gainsaying the fact that in these four decades, budgetary allocation to education and health has been very low considering the rise in population with its demand for health provisions and education services. The World Health Organisation (WHO) and United Nations Children's Fund (UNICEF) are jointly supporting countries to overcome healthcare and education challenges through interventions and policy directives. These two institutions have decried the high level of out of school children and poor health conditions of the people blaming the government of poor funding and misplacement of priorities. Health is regarded as one of the most important factors to the achievement of growth in an economy. In the light of this, there has been a consensus among researchers who have recognized health as a public good; the demand and supply of which are not considered safe to be left at the mercy of the invisible hands (Olarinde, 2014). Therefore, in facilitating the achievement of a long run goal of enhancing the nation's economic growth and development, (high living standard, access to health care provisions and impactful and quality education) are needed and ought to be provided by the government (Riman, 2012).

Ebhotemhen and Hezekiah (2021) in a study of the impact of public spending on health on economic growth, recommends an increase in budgetary allocation by the government for economic growth and prosperity. In another study by Olayiwola, Bakare and Abiodu (2021) mirrors a long run relationship between government spending on health and economic growth in Nigeria. Health is regarded as one of the most important factors to the achievement of growth in an economy.

Nigeria spends an almost insignificant proportion of her financial resources on education. In Nigeria, education expenditure which stood at 6.17 per cent in 2010 increased slightly to about 6.65 per cent in 2016 and decelerated to 5.94 per cent in 2018 and decline further again to 5.86 per cent in 2019. However, there was a quantum leap in budgetary allocation to education in 2023. For instance the education sector that received 5.68 per cent of total annual budget in 2021 received about 8.8 per cent in 2023, the highest in four years (NBS, 2023). The United Nations Educational, Scientific and Cultural Organization (UNESCO) recommendation of 26 per cent of the total expenditure be devoted to education has never been implemented in Nigeria. Ghana has surpassed Nigeria and approaching the minimum by budgeting about 21.7 percent of her annual national budget to education 2021 (WDI, 2022).

Nigeria, as a leading developing economy in Sub-Saharan Africa, has not been able meet the 15 per cent annual budgetary allocation target set by the National Declaration Health Act and African Union countries. This target has not been met in the past two decades, Nigeria has wallowed around 4 percent average since the National Health Act was declared. The budgetary allocation to the sector has not maintained a steady rise but an up and down movement despite the rising population and increasing health challenges like Ebola, HIV-Aids and COVID 19 pandemic. For instance, the annual budgetary allocation to health that stood at 5.8 per cent in 2015 declined to all time low of about 3.9 per cent in 2018 and limped to about 4.1 per cent in 2019 and made an insignificant increase to 4.6 per cent in 2022. In effect Nigeria's annual budget in the last decades averages 4 per cent far below the 15 per cent minimum threshold it set for herself.

Nigeria is a paradox of some sort, it is a country with abundant financial resources yet her people face stark realities of poverty and disease with a large army of school drop-out. The two sectors that have been identified as the engine of growth has continued to suffer poor funding and neglect. It is theoretically and empirically imperative that increase in government spending especially in the two critical sectors spur economic growth and development in both developed and developing countries (Kundu, 2018). This study therefore, attempts to estimate the joint effect of government spending on health and education on Nigeria's economic performance.

Literature Review

Ebhotemhen and Hezekiah (2021), examined the impact of public health expenditure on Nigeria's health sector performance beginning from 1981 to 2020, using a secondary source of data and employing Autoregressive Distributed Lag. The results of the Error Correction Mechanism (ECM) accentuated the connection between Public Healthcare Expenditure and Health Sector Performance in Nigeria through the establishment of a stable long-term equilibrium relationship among the variables employed in the model. Therefore, this study recommends not only an increase in the budgetary allocation to the health sector but also establishing a platform that will ensure probity and accountability in the Health Sector.

Olayiwola, Bakare-Aremu, and Abiodun (2021) re-examined the connection between public health expenditure and economic growth in Nigeria within the context of Wagner's theory of ever-increasing State activities. Data for this study are annual time series data from 2000 to 2016 sourced from World Development Indicators and publications of the World Health Organization regarding health and public health expenditures. The study employed the Autoregressive redistributed Lag (Bounds Testing) Approach to test the long-run relationship between human capital formation and sustainable development in Nigeria. The study found evidence of a long-run relationship between public health expenditure and economic growth. Thus, the study suggested that health insurance should be expanded to cover more people to mobilize more resources for the health sector. These may engender the required impact of health care expenditure on economic growth in Nigeria.

Rufai, Ogunniyi, Abioye, Birindwa, Olagunju, and Omotayo (2021), in their study to know if economic shocks influence a household's healthcare expenditure, evidence from rural Nigeria employed a two-step Heckman selectivity model to examine factors influencing the decision to spend on health and the effects of economic shocks on health expenditure. The study used a primary source of data obtained from a general house survey. The results from the first stage show that the likelihood of spending on health increased with age, education, and income, and decreases if the household is living in the northern region of Nigeria and uses a mosquito bed net. The findings from the second stage estimation show that a fall in the price of food items, an increase in the price of inputs for household enterprises, and loss of a job are the significant shocks that affect household health expenditure. The study, therefore, concluded that a fall in the prices of major food items consumed within the household increased the income available for health care among the farmers. The study further recommends the provision of holistic health-economic-welfare interventions for the marginalized rural populace in Nigeria.

Osemwengie and Shaibu (2020), investigated the impact of public health expenditure on diseases/epidemics in Nigeria particularly as development assistance for HIV/AIDS decreases. Data were sourced from the World Development Indicator (WDI) from the period of 1982 to 2016 and analysis was done using a vector autoregressive (VAR) methodology. The findings from the VAR analysis indicate a negative significant relationship between HIV prevalence and government expenditure on health. The paper further recommends that government expenditure on health would be a viable alternative for the management and control of epidemics/diseases in Nigeria cum to achieve the HIV/AIDS goal by 2030 compared to the per capita income of households.

Anochiwa, Obila and Enyoghasim (2019), empirically analyzed health outcomes and economic growth; proxied by life expectancy at birth and gross domestic product per-capita respectively using quantitative analysis. The data for the study was obtained from secondary sources, particularly from Central Bank of Nigeria (CBN) publications such as the CBN Statistical Bulletin, CBN Economic and Financial Review Bulletin, and data from World Bank economic indicators. The study employed the three-stage -least -square (3SLS) regression to estimate the result. The result showed simultaneity between health outcomes

and economic growth. The results equally show that health expenditure is significant in determining health outcomes but has no significant relationship with economic growth. The study has the recommendation that government must increase budgetary allocation to the health sector and effectively monitor its utilization.

Hamzat, Ebeh and Ali (2019) undertook a study to investigate the impact of health expenditure on the child mortality rate in Nigeria from the period of 1980-to 2015. The study made use of secondary sources of data from the World Development

Index under the World Bank and World Economic Outlook (WEO). The study employed the Autoregressive Distributed Lagged (ARDL) model using the unit root test, co-integration test, and error correction mechanism. The results obtained revealed that all the variables used have negative impacts on infant mortality rate and also are statistically significant. Thus, in reducing the infant mortality rate in Nigeria, there is a need for government and private stakeholders to invest adequately in the health sector to ensure health service that is accessible and affordable to the teeming population of the country.

Given the debate on the direction of causality between economic growth and health performance and by extension productivity, Nwani and Kelikume (2019), studied the direction of causality between public expenditure on health, health status, and economic growth in Nigeria using the Granger causality test technique. The study found a long run relationship between public health spending and productivity; causality flows from public health spending to economic growth

Rezapour, Mousavi, Lotfi, Soleimani, Movahed and Alipour (2019), in their paper attempted to compare the effects of different levels of health expenditure on life expectancy, infant mortality rate, and under-five mortality rate as health indicators. Methods: The current study is analytical research, which was conducted based on cross-sectional and annual time series data. In this study, the effects of private and public health expenditure on health indicators from 2000 to 2015 were investigated. The selected countries had the middle or high-income levels and were classified into three groups based on the public health expenditure rate and the k-mean method. The required data were collected from the World Bank site and for estimating the model, panel data regression models were used. Results: Public health expenditure had a significant effect on health indicators in all groups, thus, an increase in public health expenditure led to increasing life expectancy and a decrease in infant and under-five mortality rates in all groups. Also, the group with the highest share of health expenditure had a greater impact on life expectancy and infant mortality; however, in regards to the under-five mortality rate, it was the contrary. The effect of private health expenditure was different and in most cases it had no significant effect. Conclusively, the findings of this study indicated that public health expenditure is more effective than private health expenditure and it also improved health status by creating positive external effects. Therefore, the governments must provide enough required financial resources for improving the health status.

Aluko and Aigbedion (2018), examined the impact of public health expenditure on economic growth in Nigeria from 1995-to 2016. The data used for this research was obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin Publication, National Bureau of Statistics (NBS), and Annual Abstract of Statistics for various years, and the World Bank online Databank. Ordinary Least Squares (OLS) and Error Correction Model (ECM) was adopted for this study. The results from this study showed that public health expenditure has the potency to faster economic growth in Nigeria but government health expenditure and Corruption Perception Index have little or no significant impact on economic growth in Nigeria. To this effect, the study recommended that the government should put in place a monitoring and evaluation mechanism to ensure that the money released is utilized for the right projects in the health

sector for effective health service delivery and sustainable economic growth in Nigeria.

Boachie, Ramu, and Polajeva (2018) re-examined the link between government health expenditures and health outcomes to establish whether government intervention in the health sector improves outcomes. The study used annual data for the period 1980 to 2014 in Ghana. Employing the ordinary least squares (OLS) and the two-stage least squares (2SLS) estimators found that aside from income, public health expenditure contributed to the improvements in health outcomes in Ghana for the period., overall, increasing public health expenditure averts infant and under-five deaths in every 1000 live births while increasing life expectancy at birth despite that the health effect of income outweighs that of public health spending.

David (2018), used Autoregressive Distributed Lag (ARDL) bounds testing approach to co-integration and the Granger causality technique to empirically examine the nature of the relationship between infant mortality and public expenditure on health in Nigeria from 1980 to 2016. The data used was collected from the Central Bank of Nigeria (CBN) statistical bulletin and the World Bank Development Indicators (WDI). Among other things, the empirical results showed the presence of a significant cointegrating (long-run) relationship between infant mortality and government health expenditure (and private health expenditure, immunization, and external health resources), coupled with the existence of a bi-directional causal relationship between infant mortality and government health expenditure. In addition, the results also demonstrated that government health expenditure, private health expenditure, immunization, and external health resources significantly influence infant mortality negatively both in the long and short term. In essence, it was recommended for the total overhaul of the Nigerian health sector, to improve the efficiency of the sector, as well as curb the incidents of fund mismanagement which has plagued the sector over time, coupled with the intensifying of immunization programs and activities.

Igbiniedion and Olele (2018), investigated the nexus between public health expenditure and health outcomes in Nigeria (using maternal mortality as a proxy for the latter). The study used time-series data for the period covering 1981-2014, obtained from the Statistical Bulletin of the Central Bank of Nigeria, National Bureau of Statistics (NBS), World Development Indicators (WDI) of the World Bank, and other sundry sources. Co-integration and error correction models were employed in the cause of this analysis. The results of the analysis revealed that the maternal mortality rate declines as both public health spending and private health expenditure rise, suggesting that public health spending does not crowd out private health financing within the Nigerian context. The study, therefore, recommended the need for policymakers to adopt a multi-pronged approach which should include but is not limited to, the diversification of the productive base of the economy to raise the revenue trajectory of the nation, economic status of women as well as guarantee the provision of good quality facility-based delivery care system will ultimately reverse the mortality rate in the country.

Nwani, Kelani, Ozegbe and Oluleye (2018) examined the impact of Public Health Expenditures and Pollution on Nigerians' Health Status. The examination used annual secondary time series data spanning 37 years (1981-2017) collected from the Central Bank of Nigeria statistical bulletin and World Development Indicator. The study employed the Auto Regressive Distributed Lag Model (ARDL) technique. The result showed that Public Expenditure on Health has a positive and significant impact on health outcomes in Nigeria. Again, environmental pollution as proxied by per capita CO₂ emission has a negative and significant effect on health outcomes in the country. The economic growth rate was found to have a positive impact but insignificant in enhancing life expectancy (a proxy for health outcome) in Nigeria. Based on the empirical findings, the study recommended that the government should sustain the flow of resources to the health sector and improve environmental practices through the formulation of

new national environmental policies and better awareness campaigns through the deployment of community health extension workers (CHEW).

Onoja, Okafor and Akaolisa (2020) in a study the implications of government spending on education on output growth of Nigeria finds changes in government spending have no significant effect on economic growth. Their study also reveals that in the long run, expenditure on education has positive and significant impact on output growth in Nigeria. It showed that output growth was impressive following an increase in government spending.

Lawanson (2015), examined the relevance of educational and health components of human capital to economic growth from 1980 to 2013, using a panel data from sixteen West African countries. The study employed Diff-GMM dynamic panel technique. The empirical findings showed that coefficient of both education and health has positive statistically significant effects on GDP per capital. The paper affirms the strong relevance of human capital to economic growth of West Africa. He recommended that increased resources and policy initiatives to motivate and enhance access to both health and education by the population should be pursued by policy makers. Lamentably, the study was unable to carry out standard econometric test.

In a study of the human capital proxied by education and effective health care service and economic growth in Nigeria during the period 1980 to 2012 by Oladeji (2015), using regression analysis finds long run relationship between the variables and recommended an increase in funding of education and health by the Nigerian government..

In a similar study, although in aggregated form, Obi and Obi (2014), examined the impact of education expenditure on economic growth in Nigeria using standard econometrics method and found that education manifests significant and positive impact on gross domestic product.

Shazia, forhan, Muhammad and Juan (2023) studied the implication of government spending on health and education sectors on economic growth in Asian countries. Gupta, Marigin and Erwin studied the effectiveness of government spending on education and healthcare in developing and transition countries using econometrics method and their findings revealed a positive and long run relationship between government spending in the two sectors and economic indicator variables.

In a similar vein, Maitara and Mukhopadhyay (2012) found that public spending on education and health care significantly impact on economic growth in some selected countries in Asia and the Pacific. Their study applied Panel analysis to examine how each country performed in the regression estimation, the result revealed that most of the country's GDP growth depends largely on government spending on education and healthcare. For instance, Bangladesh manifested a positive and significant effect of government spending on healthcare and education on output growth.

Kundu (2018) examined the role of government spending on the education and health sectors in promoting the gross domestic of India using the Johansen cointegration test and vector autoregression model and that government spending on healthcare and education does not exert any impact on GDP whereas two periods lagged GDP granger caused the government spending on health and variance decomposition analysis indicates that in India education and healthcare spending contribute about 3 per cent and 15 per cent respectively to GDP growth.

Theoretical Framework

This study is anchored on the Wagner's public expenditure hypothesis on health, education and the endogenous growth theory.

Public expenditure theory

There are two ways to approach the theory of public expenditures. We can adopt a normative perspective and consider the part that government spending ought to play in an economy that works efficiently. Alternately, we may look at the sociology or politics of fiscal behavior, which would explain the forces at play in the current historical and institutional context when determining real expenditure policy. The two major aspects are allocation and distribution functions.

Allocation function

Public expenditure theory and public finance theory borders more on how to determine proper level and pattern of public service. In other words, the issue is how to allocate available resources between satisfying "private" and "social" desires. This instantly raises a second concern when seen from an economic perspective. The theory of expenditure-making and the theory of expenditure-financing are inextricably linked since public services must be justified in terms of their opportunity cost.

There have been failed attempts in dealing with this problem. In *The Wealth of Nations*, written by Smith in 1776, he directly addressed both of its facets. He claimed that some services, such as maintaining the sovereign, defense, some aspects of education, and some public works that need too much capital to be handled privately, must be given by the state. To ensure that everyone contributes "as nearly as feasible in accordance to their respective abilities, that is, in proportion to the revenue which they respectively enjoy under the protection of the state," the financing should therefore be made available through taxes (Smith 1776). Ingeniously embedded in a single formula, this rule contains the roots of both the "ability to pay" and the "benefit" theory, the two approaches that were to provide the major strands of future discussion.

The ability-to-pay doctrine became the dominant view among British writers. It was reformulated by J. S. Mill in 1848 in terms of equality of sacrifice, translated by Edgeworth in 1897 into a requirement of least total sacrifice, and refined by Pigou in 1928 into a choice between equality of absolute, proportional, or marginal sacrifice. As a doctrine, it was attractive both to social reformers, who looked upon it as an instrument of income equalization, and to conservatives, who shied away from the more positive view of public expenditures embedded in the benefit approach.

The benefit approach, from the beginning, had the advantage of linking the revenue and expenditure sides of the budget problem. The question, however, is whether these individual gains can be measured since otherwise, the benefit principle lacks operational meaning. A first answer was given by Smith's hypothesis that the essential service of government is protected and that the value of protection received may be measured in terms of income. This protection version of the benefit approach was subsequently adopted by many Continental writers. In many instances, it provided a vehicle for imposing severe limits on the scope of budget activity, and through most of the nineteenth century, the discussion of the benefits fell far short of its inherent possibilities.

Distributional function

If tenets of modern welfare economics are accepted, economics, as previously noted, has nothing to say on the basic issue of income distribution. While the economic analyst may explore the consequences (regarding the level of output, growth, and other factors) of various changes in distribution, he cannot compare the merits of alternative distributions of a given output (Arrow, 1951). This could be done only if interpersonal utility comparison is admitted and an operational procedure of comparison could be devised.

However, this may be, distribution does present a policy issue. This is obvious in the socialist setting, where the return to capital accrues to the state, and wages paid need not equal the return to labor as a planning cost. But even in the most capitalistic of countries, distribution is not left entirely to the ownership of factors (labor as well as capital and natural resources) and the market system of factor pricing. Some degree of intervention is held necessary if only to provide for the indigent. Beyond this, society may consider the unadjusted state of distribution to be less or more equal than is held desirable and choose to make the necessary adjustments.

Endogenous growth theory of Paul Romer's (1986)

Paul Romer (1986) views economic growth to be dependent on the improvements of education through research, innovations and new ideas. Jones, (2019) opines that improvement in productivity and output is correlated with increase in human capital. The theory considers changes in technology advancement as key to increase in productivity and output. It also recognizes innovation, education as a driver to economic growth. In effect combining improvements in human capital through education, new technological ideas enhances the production of goods in the economy.

In the long run the rate of economic growth depends on the growth rate of total factor productivity (TFP) which is determined by the efficiency and intensity of inputs used in production which in turn is determined by the rate of technological development (Romer, 1986).

Endogenous growth is further backed up with models in which economic agents who postpone their current consumption to be able to save and perfecting the allocation of resources to research and development resulting to technological growth. The AK model is simplified of the form:

$$Y_t = AK_t^\beta K_t^\theta L_t^1 \tag{1}$$

Where, A is a positive intercept, K_t is capital stock, L_t is the amount of quantity of labour and Y_t = output

Methodology

The methodology for this study is multiple regression analysis using the following estimation techniques; unit root tests, co-integration tests, Autoregressive Distributed Lag model (ARDL).

Model specification

The model is first expressed symbolically in a functional form bearing in mind the underpinning theories of the study as:

$$\text{GDP} = f(\text{GEXED} + \text{GEXH} + \text{PSCENR})$$

The functional form of the relationship between the dependent variable and independent variable was transformed to a linear model as:

$$\text{GDP} = b_0 + b_1\text{GEXED} + b_2\text{GEXH} + b_3\text{PSCENR} + U_t$$

GDP = Gross Domestic Product;

GEXED = Government Expenditure on Education;

GEXH = Total Government Expenditure on Health;

PSCENR = Primary School Enrollment.

B_1 = Regression coefficient of total government expenditure on education;

B_2 = Regression coefficient of total government expenditure on health;

b_3 = Regression coefficient of primary school enrollment;

U_t = Error Term

A priori expectation

Theoretical underpinning of this study suggests that increase in public spending on education and healthcare have significant and potential positive effect on economic growth of Nigeria **Estimation procedure**

A pretest was conducted which include: Unit root test, co-integration test, vector error correction mechanism

Unit root test

The test of stationarity of the time series was conducted using Augmented Dickey fuller test statistics. The Augmented Dickey fuller (ADF) test statistics was conducted using the critical values at 5% level of significance. The tests are conducted with and without a deterministic trend (t) for each of the series.

Co-integration tests

In an attempt to test the long run validity of the result before its estimating the model, the Johansen Co-integration approach was used in the study: using the Johansen Co-integrating normalized coefficients to ascertain the nature of the long run relationship between the estimated variables.

It is used to test for the long run relationship between the variables. Johansen Co-integration approach was used by the researcher in the course of the analysis hence; the use of Johansen Co-integrating normalized coefficients is to ascertain the nature of the long run relationship between the estimated variables. Engel and Granger (1987) pointed out that a linear combination of two or more non-stationary variables may be stationary. If such a stationary combination exists, then the non-stationary time series are said to be co-integrated.

The test concerns a test of the null hypothesis that there is r of co-integrating vectors against the alternative that r + 1 co-integrating vector.

Gross domestic product

The data for gross domestic product (GDP) which serve as a proxy for economic growth was measured at constant market price for the period of the study

Government Expenditure on Education

These are federal government budgetary spending on capital and recurrent expenditure on education expressed in naira captured based on the scope of the study.

Government Expenditure on Healthcare

These are federal government budgetary spending on capital and recurrent expenditure on health for the period of 31 years expressed in naira.

Primary School Enrollment

This is the total enrolment in primary school education of all sexes and age expressed as a percentage of the population of official primary education age drawn from (1986-2019). These gives 33 years time series or 31 observations.

Sources of data employed

These data was collected from the Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics.

Test of Stationarity

This was estimated by the ADF unit root test. The estimation technique is carried out to determine the status of the series to ascertain the order of integration and the technique to be used in estimating the model of the study.

Data Presentation and Analysis

Table 1: Augmented Dickey Fuller (ADF) Unit root Test

Trend and Intercept

Variables	First Difference		Remarks	Remark
	ADF Statistic	5% Critical Value		
GDP	-3.724121	-3.526609	Stationary	I(1)
GEXPED	-9.215282	-3.557759	Stationary	I(0)
GEXPH	-6.740507	-3.529758	Stationary	I(1)
PSCENR	-4.650255	-3.644963	Stationary	I(1)

From the result presented in table 1, it is evident that all the series are stationary at first difference and integrated of order I(1) except GEXPED that is stationary at level and integrated at level (0) measured at significant level of p-values less than (0.05).

Table 2: Result of Bound Test Approach to ARDL

TEST STATISTIC	VALUE	K
F-STATISTIC	2.6500	4
CRITICAL VALUE BOUNDS		
SIGNIFICANCE	I(0) BOUND	I(1) BOUND
10%	2.37	3.20
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source: Authors' Computation using EVIEW 9.

Table 3. Short-run ARDL result

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(GDP(-1))	0.284258	0.226870	1.252955	0.2307
DLOG(GDP(-2))	0.093435	0.212554	0.439584	0.6669
DLOG(GDP(-3))	0.724651	0.256009	2.830562	0.0134
DLOG(GEX)	0.162720	0.061914	2.628169	0.0199
DLOG(GEX(-1))	-0.038594	0.046964	-0.821766	0.4250
DLOG(GEX(-2))	0.143236	0.046852	3.057174	0.0085
DLOG(GEX(-3))	-0.086795	0.024770	-3.504055	0.0035
DLOG(GXH)	-0.160951	0.056261	-2.860786	0.0126
DLOG(GXH(-1))	-0.105785	0.063266	-1.672071	0.1167
DLOG(GXH(-2))	-0.219763	0.056850	-3.865666	0.0017
D(PSER)	0.000555	0.002738	0.202670	0.8423
D(PSER(-1))	0.009504	0.003550	2.677513	0.0180
D(PSER(-2))	-0.000179	0.003183	-0.056347	0.9559
CointEq(-1)*	-0.162323	0.039328	-4.127465	0.0010

The existence of cointegration among the variables as indicated above presents an evidence of long-run economic relationship among the variables. It captures both the long run equilibrium and short run dynamic relationships associated with the above results.

Result/Discussion

Government Expenditure on Education (DLGEXPED): Government expenditure on education is statistically significant because the p-value of 0.0035 is less than 0.05. Therefore, there exists a positive and significant relationship between government expenditure on education and economic growth. One per cent increase in government expenditure on education brings about an increase in gross domestic product by 0.17 per cent.

Government Expenditure on Healthcares (GEXPH): government Expenditure on health is statistically significant since the p-value of 0.0017 is less than 0.05 and coefficient of two period lag is (-0.2197). Therefore, there exists a negative and significant relationship between government expenditure on healthcare and economic growth. One per cent increase in government expenditure on healthcare brings about a decrease in gross domestic product by 0.21 per cent.

Primary School Enrollment (PSER): Primary school Enrollment is statistically significant since the p-value of 0.0180 is less than 0.05 and coefficient of one period lag is (0.0095). Therefore, there exists a positive and significant relationship between school enrollment and economic growth. One per cent increase in school enrollment brings about an increase in gross domestic product by 0.009 per cent.

Error Correction Model (ECM)

Furthermore, the results showed that the ECT is negative, fractional and significant, which satisfies all conditions required for the application of econometric techniques in any study. The ECT value of (-0.16232) and the associated p-value is (0.0010), which is less than a 5% chosen level of significance. This result implies that the short-run disequilibrium that can be corrected towards the long-run equilibrium relationship by 16.2 per cent speed of adjustment annually.

Diagnostic Tests

The validity of the model in regression is tested to establish the stability of the underlying model by examining the status of the variables used for the investigation by investigating the presence of the Heteroscedasticity, autocorrelation, and non-stability in the equation.

Breusch-Godfrey Serial Correlation LM Test

From the result, there exist no serial autocorrelation since the value of chi-square is greater than 0.05% level of significance.

Table 3: Breusch-Godfrey Serial Correlation LM Test Result

Null hypothesis: There are no serial correlation errors			
F-statistic	0.897972	Prob. F(2,13)	0.4312
Obs*R-squared	3.762806	Prob. Chi-Square(2)	0.1524
Source: Researcher's compilation from E-view 9			

Heteroscedasticity Test

The result reveals that there exist no heteroscedasticity given that the f-probability is greater than 0.05% level of significance.

Heteroscedasticity Test Result

Null hypothesis: there is no Heteroskedasticity in the model			
F-statistic	2.338452	Prob. F(1,28)	0.1374
Obs*R-squared	2.312365	Prob. Chi-Square(1)	0.1283

Source: Researcher's compilation from E-view 9

The post estimation result for robustness of the results obtained in the analysis indicated that the findings are reliable since the test of heteroscedasticity and serial correlation are satisfactory. There is no evidence of heteroscedasticity and positive serial correlation.

Policy Recommendations

Based on the findings, the paper provides the following recommendations

The government should increase the amount of its expenditure on the health sector as regards to its budget to meet up to the 26 per cent threshold as it's discovered in the result that it has significant increase Nigeria's GDP enhances improvement in the life expectancy rate, mortality and increases output growth of the economy. More so, having indicated that total government expenditure on health has a positive and significant impact on economic growth.

The study also estimated the effect of primary school enrollment and found that primary school enrollment indicated a positive and significant effect on economic growth of Nigeria. This paper, therefore recommends that the government should step-up budgetary allocation to the sector to finance compulsory, free education policies as panacea to increase in primary school enrollment and reduce the population of out of school children. The study also recommends over-hauling and restructuring of the education sector targeting curriculum that suits industry's work-type and demands which will in turn gear up and spur productivity in the economy.

References

- Aluko, O. O. & Aigbedion, I. M. (2018). Public health expenditure and economic growth in Nigeria: An error correction model. *Journal of Economics, Management and Trade*, 21(6), 1-11.
- Anochiwa, L. I., Obila, E., & Enyoghasim. (2019). Modeling the effects of health care expenditure and economic growth in Nigeria: An econometric analysis. *Journal of PerspektifPembudayaan dan Pembangunan Daerah*, 6(5), 573-582.
- Boachie, M. K. & Ramu, K. (2017). Public Health expenditure and health outcomes: A review. *International Journal of Management and Development Studies*, 6(1), 15-21.
- Biswajit Maitara and Mukhopadhyay C. K. (2012). Public spending on education healthcare and economic growth in selected countries of Asia and the Pacific. *Asia pacific development journal (ESCAP)* 19(2) 19-48
- Charles I. J. (2019). Paul Romar: Non rivalry, endogenous. *Journal of Economics* 121(3).
- David, J. (2018). Infant mortality and public health expenditure in Nigeria: Empirical explanation of the nexus. *Timisoara Journal of Economics and Business*, 11(2), 149–164.
- Ebhotemhen, W. & Hezekiah, O. (2021). Impact of public health expenditure on the Nigerian health sector performance: Empirical investigation. *Gusau International Journal of Management and Social Sciences, Federal University, Gusau*, 4(2), 88-100
- Gupta, S., Verhoeven, M., & Tiongson, E. (2002). The effectiveness of government spending on education and health care in developing and transition economies. *European Journal of Political Economy*, 18(4), 717-737..
- Hamzat, S., Ebeh, J.E., & Ali, M. (2019). Impact of health expenditure on child mortality rate in Nigeria, 1980-2015. *Lafia Journal of Economics and Management Sciences (LAJEMS)*, 4(1), 33-49.
- Igbinedion, S.O. & Olele, E.H. (2018). Does public health expenditure promote health outcomes in Nigeria?. *Amity Journal of Healthcare Management*, 3(1), 1–13.
- Kudu Amit (2018). The effectiveness of public spending on education and healthcare in India. *Journal indexing and metrics* 65(1-4). <http://doi.org/10.1177/0019.....5>
- Lawanson, A. O (2015). *Economic growth experience of West African region: Does human capital matter?*. *International Journal of Business and Social Science*. 6(12).
- Nwani, S. E. & Kelikume, I. (2019). Causal linkage amongst public expenditure on health, health status and growth: new empirical evidence from Toda-Yamamoto approach for Nigeria. *Journal of Scientific Research & Reports*, 24(3), 1-13, DOI: 10.9734/JSRR/2019/v24i330155
- Nwani, S.E., Kelani, F.A., Ozegbe, A.E., & Oluleye, H.B. (2018). Public Health Expenditures, Environmental Pollution and Health Outcomes: Evidence from Nigeria. *South Asian Journal of Social Studies and Economics*, 2(2), 1-15. DOI: 10.9734/SAJSSE/2018/v2i225846.
- Obi, Z. C., & Obi, C. O. (2014). Impact of government expenditure on education: The Nigerian experience. *International Journal of Business and Finance Management Research*, 2(2104): 42-48.
- Obisike, N. E., Iwuchukwu, U.R., Unegbu, P.I., & Achumie, E. N. (2021). Impact of public health spending on health outcomes in Nigeria. *International Journal of Economics and Financial*

Management, 6(1), 20-31 www.liardpub.org

- Oladeji, A. O. (2015). Impact of human capital development on economic growth in Nigeria. *International Journal of Recent Research in Commerce Economics and Management*, 2(2): 151-164.
- Olalere, T.O. & Adenugba, A.A. (2013). Human capital development in first bank of Nigeria plc. *Mediterranean Journal of Social Sciences*, 4(2): 783-801.
- Olarinde, M. O. & Bello, A. A. (2014). Public healthcare expenditure and health sector performance in Nigeria: Implications for sustainable economic development. *IOSR Journal of Economics and Finance (IOSR-JEF)*, 4(3), 39 – 55.
- Olayiwola, S.O., Bakare-Aremu, T.A., & Abiodun, S.O. (2021). Public health expenditure and economic growth in Nigeria: Testing of Wagner's hypothesis. *African Journal of Economic Review*, 9(2), 130-150.
- Onoja J. E.; Okafor, S. O. & Akaolisa, C. J. (2020). Government education expenditure and educational in Nigeria. *Journal of Economics Studies (14) 1*
- Rahman, M.M., Khanam, R. & Rahman, M. (2018). Health care expenditure and health outcome nexus: new evidence from the SAARC-ASEAN region. *Global Health*, 14, 113 <https://doi.org/10.1186/s12992-018-0430-1>
- Rezapour, A., Mousavi, A., Lotfi, F., Movahed, M., & Alipou, S. (2019). The effects of health expenditure on health outcomes based on the classification of public health expenditure: a panel data approach. *Shiraz E-Med Journal*, 20(12), e88526. doi:10.5812/semj.88526
- Riman, H. B. & Akpan, E. S. (2012) Healthcare financing and health outcomes in Nigeria: A state level study using multivariate analysis *International Journal of Humanities and Social Science*, 2(15), 20-32.
- Roma, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94 :1002-37.
- Rufai, A.M., Ogunniyi, A.I., Abioye, O.D., Birindwa, A.B., Olagunju, K.O., & Omotayo, A.O. (2021). Does economic shocks influence household's healthcare expenditure? Evidence from rural Nigeria. *Heliyon*, 7(2), e06897, <https://doi.org/10.1016/j.heliyon.2021.e06897>
- Shazia, K.; Forhan, A.; Muhammad, A. & Juan E. T. S. (2023). Is government spending in the education and health sectors necessary for human development. *Journal of Humanities and Social Sciences Communication*. <http://doi.org/10.1057/41599-023-01514-3>
- Sataru, F., Twumasi-Ankrah, K., & Seddoh, A. (2022). An analysis of catastrophic out-of-pocket health expenditures in Ghana. *Health Services*, 2, 706216. doi:10.3389/frhs.2022.706216.
- UNICEF Strategic Plan (2018-2021). Executive summary <https://www.google.com/search?client=firefox-Cbd&q=Goodhealth+and+academics+performance+according+UNICEF+2021PDF>.
- UNICEF (2018). <https://www.unicef.org/nigeria/press-releases/43-million-children-nigeria-still-miss-out-vaccinations-every-year>
- United Nations Children's Fund (2020). Pure earth: *The toxic truth: Children's exposure to lead pollution*

undermines a generation of future potential, UNICEF and Pure Earth, July 2020.

WHO (2010). *World health statistics*. Geneva: World Health Organization.

WHO/UNICEF/UNFPA/World Bank (2016). Report of the SAGE Working Group on Maternal and Neonatal Tetanus Elimination and Broader Tetanus Prevention.

World Health Organization (2017). *Inheriting a sustainable world: Atlas on children's health and the environment*, WHO, 6 November 2017.

World Health Organization (2019). *Global Health Expenditure database* (apps.who.int/nha/ database) <https://data.worldbank.org/indicator/SH.XPD.CHEX.GD.ZS>

World Health Organization, UNICEF, United Nations Population Fund and the World Bank (2019). *Trends in Maternal Mortality: 2000 to 2017*. Geneva: WHO.