GOVERNMENT SPENDING ON HEALTH AND ECONOMIC GROWTH IN NIGERIA

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Abstract

The study examined government spending on health and economic growth in Nigeria (1990 – 2021). The role of government expenditure in health is crucial fostering economic growth particularly in developing countries like Nigeria. However, the impact of government expenditure on health in Nigeria has been relatively low due to high level of corruption, low government expenditure as well as low private partnership of individual into the sector. The objectives of the study include; assess the impact of government health expenditure on economic growth in Nigeria, investigate the extent to which government expenditure on education impacted on economic growth in Nigeria and determine the impact of life expectancy on economic growth in Nigeria. The study adopted descriptive research design as the methodology. Economic growth was used as the dependent variable whereas government health expenditure, government expenditure on education, life expectancy was used as the independent variables. ARDL – Bound Test was employed and the result disclosed that there was a long run relationship existing between government expenditure on health and economic growth in Nigeria. Moreover, the estimated long run coefficients of the variables of the study indicated that as thus: government health expenditure, government expenditure on education and life expectancy had positive and significant impact on economic growth in Nigeria. Consequently, the study recommends that government should ensure that budgetary allocation to health sector is judiciously utilized in order to meet the health needs in Nigeria. Government should increase budgetary allocation to the educational sector to reflect UNSCO recommendations of 26 percent of the national budget and 6 percent of the gross domestic products (GDP) for developing country like Nigeria and government should increase the amount of its expenditure on the health sector to meet up to the 15% threshold as it's discovered from the empirical result that it enhances improvement in life expectancy.

Keywords: government spending, health, economic growth, Life expectancy, Nigeria

Introduction

Government spending on health over the years has been an important policy in ensuring healthy of the nation which leads to economic growth and over all welding of the masses. The health of any nation's inhabitants is crucial to its economic growth, given the considerable positive correlation between the two (Sachs, 2001). Hence, health, in this case, refers to the general state of fitness, wellness, or completeness of individuals and their ability to adapt to and achieve desired environmental changes. Ginsburg (2008) affirmed that both men and women rank health as their highest priority in life. Health-care expenditures, therefore, aim to improve people's overall health, longevity, and quality of life. Therefore, there are significant positive externalities associated with health-care expenditure; Just as the socio-economic development of a country is linked quite significantly to the health and well-being of its people (Wahab, Kefeli, & Hashim, 2018). Therefore, long-term investments in healthcare provide immediate short- and long-term benefits to citizens, which in turn enable a nation to realize benefits for its investment or potential.

However, investing in health has lately become an indispensable social priority because proper human capital enhances workers' skills, efficiency, and standard of living (Ojo & Ojo, 2022). Moreover, human capital accumulation was a fundamental determinant of economic performance owing to efficiency, and higher economic growth enables more human capital investment. As a result, there are links between economic growth and human capital accumulation via health (Eggoh, Hilaire, & Gillies, 2015).

Therefore, the health-care cost around the world is growing at a faster rate than the economies of countries. It is on this note that the Organization for Economic Co-operation and Development (OECD, 2020) stated that there was an imbalance between the growth of health-care expenses and the GDP or income in both developing and developed countries, which raises concerns about how health-care needs will be met in the future.

However, to achieve a balance between government health expenditure and growth in economic growth, is where the government has a lot to do. Wagner (1883), in examining the growing importance of government activities, postulated a law of expanding state activities. Wagner (1883) suggested a connection between economic growth and public expenditure. The idea supporting this relationship is the fact that increases in public spending are an inevitable consequence of economic growth. This means that the share amount of public spending rises with an increase in the rate of output growth. Public health expenditures refers to the expenditures of Federal, State, and Local governments in the health sector. It constitutes a significant part of government social spending and hence, government expenditures.

The multiplier effect of increased public health expenditures may lead to an increase in total expenditures and aggregate demand. As an indication of commitment toward improving the performance of the health sector in its fiscal operation, the Nigerian government took the responsibility of providing good healthcare facilities by increasing its expenditure on health. Available data shows that on average, about 2.1% to 5.8% of total government expenditure was allocated to the health sector between 2000 and 2019. The country's public expenditure on health as a percentage of GDP is about 4.1% against the 4.6% African average and 6.3% in developed countries (Olarinde & Bello, 2014). However, the multiplier effect of increasing government health expenditure in Nigeria is still marginally low and the level of its impact on economic growth is transitorily small. This is particularly worrisome given the hypothesized relationship between public expenditure and economic growth by the Wagner (1883) theory.

Under the Abuja Declaration of 2001, West African nations resolved to expand public health expenditure to 15% of total government expenditure. Therefore, a key issue in the health expenditure argument is whether nations are veering toward the Abuja declaration target or not (Tandon & Cashin, 2010; WHO, 2013). In Nigeria, public health expenditure as a percentage of government expenditure has been fluctuating over the years. It fluctuated between 5.72% and 9.19% from 2008 to 2019. As a percentage of GDP, it recorded 0.91%, 1.15%, 1.03%, 0.88%, and 0.92% from 2010 to 2019 respectively. While the increase in budgetary allocation to the health sector is highly desirable, it is not sufficient to guarantee economic growth. This is because there is a transmission mechanism between increased government health expenditure and economic growth.

However, the size and the composition of both the capital and recurrent expenditure show that government expenditure in Nigeria has been on the increasing side. Hence, thecontribution of increased spending on the health sector has not translated into an increase in economic growth. However, the government's efforts to revitalize and rejuvenate the sector have been unsuccessful because they have been ineffectual in causing change, reducing poverty and unemployment, and lowering its crime rate.

Furthermore, mismanagement in the form of corruption and underfunding in this area have resulted in the

emigration of educated doctors and health workers to other countries that understand the value of investing in health. Therefore, the study seeks to examine the effect of an increase in government health expenditure on economic growth in Nigeria.

Statement of the Problem

Health is a very important aspect of an individual's wellbeing, and since individuals make a

Nation, healthcare could be regarded as one of the necessary conditions to achieving a sustainable long-term economic development . However, this government objective of achieving sustainable economic growth has been hampered by internal problems such as inadequate human development , primitive agricultural practices , weak infrastructure , and uninspiring growth of the manufacturing sector, over reliance on natural endowment , a poor policy and regulatory environment and mismanagement and misuse of resources (Eigbiremolen & Anaduaka, 2014).

This is due to the fact that emphases had been placed on amassing physical capital to the detriment of human capital; thereby, making the level government expenditure on health less

unattractive (Muhammad and Khan , 2007).This suggests that, in Nigeria , the level of government expenditure on health in relation to the growth or increase in economic growth in the country has been marred by corruptions , embezzlement of public health fund, budget padding etc. thereby resulting to economic fluctuation as well as little or no economic growth especially in the democratic dispensation in the country . For instance , in the year 1996, the public health expenditure growth rate was 0.18%, while the growth rate of GDP was 4.19% in 1998 , the public health expenditure growth rate increased by a positive value of 0.43% while the GDP growth rate drop to 2.58%. Similarly , from 2002 to 2003 , both variables witnessed divergent changes in their growth rate as public health expenditure increased from 1.14% to
1.38% whereas GDP decreases from 15.3% to 7.34%. In 2008 and 2009 , the growth of public health expenditure drops from 3.90% in 2008 to 3.66% in 2009 whereas the value of economic growth rose from 6.76% in 2008 to 8.03% in 2009. More so, in 2016, the growth of public health expenditure recorded a positive increase of 4.20% while the economic growth has a negative value of-1.61%. similarly, in 2020, the growth rate of public health expenditure recorded a positive value of 9.52% while economic growth recorded a growth rate of the negative value of -1.97%, more so the percentage increase in the public health expenditure in 2021 was 10.7% while that of the economic growth was 3.64% which was about three times lesser than the increase in public health expenditure.

Therefore , from the above trend analysis or stylized fact, it is obvious that public health expenditure changes at a higher rate than GDP. This means that the rate of changes in public health expenditure move much faster than that of GDP. Therefore, the likely adverse economic implication of these deviations in the country's economic activities, could lead to the periodic increase in the country's unemployment and inflation rates as well as the external sector disequilibria . That is why over the observed years , unemployment , inflation and exchange rates have been on increase . For instance , between 1999 and 2000, unemployment, inflation and exchange rates rose from 17.5% to 18.1%, 6.93% to 18.87% and 4.58% to 4.67% respectively, while that of GDP increased from -1.9% to 2.4% respectively. Again, 2015 to 2020, unemployment, inflation and exchange rates increased from 9% to 17.67%, 9.02% to 11.4 % and

5.28% to 5.72% respectively , that of total GDP increased from -0.03% to 0.458% respectively (CBN , 2020). Hence , having observed these problems , the need to empirically examine the impact of government health expenditure on economic growth in Nigeria is felt; thereby making the following

questions to sharpen the focus of the study. The following research questions are considered: to what extent has government health expenditure impacted on economic growth in Nigeria? does government expenditure on education have significant impact on economic growth in Nigeria? to what extent has life expectancy impacted significantly on economic growth in Nigeria?. The specific objectives are to: assess the impact of government health expenditure on the economic growth in Nigeria, investigate the extent to which government expenditure on education impacted on economic growth in Nigeria and determine the impact of life expectancy on economic growth in Nigeria.

Literature Review

Government Health Expenditure

Health expenditure is the total of private and public health spending in a nation, including family planning, nutritional activities, and other factors. Public health spending is also further classified into government capital expenditure and government recurrent expenditure. Health is a fundamental driver of economic growth and development (Ewurum, Mgbemna, Nwogwugwu & Kalu, 2015). This is so evident in the sense that healthy nations produce more than the output of unhealthy nations. In the same vein, Grossman (1972), termed health as a durable stock producing healthy time as an output for both market and non-market activities that give utility and income respectively.

The WHO Constitution of 1948 defined health as a state of complete physical, social, and mental well-being, and not merely the absence of disease or infirmity. Health is therefore, seen as a resource for everyday life, not the objective of living. Barro (1996) defined health is an engine of economic growth and productive capital. A country benefits much more from healthy citizens, the reason being that a healthy population brings about higher growth rates in the economy than the other way round. Furthermore, health is a factor that determines growth potential in a country. Now, for this study, health is seen as an engine of economic growth and a productive asset in the form of human capital (Barro, 1996).

Health spending measures the final consumption of health care goods and services including personal health care and collective services. Health financing is a critical component of the health system. For it is the synthesis of the financing and spending flows recorded in the operation of a health system, right from funding sources to distribution. Therefore, the concept of health expenditure, as defined by the WHO (2006), is the sum of general government health expenditure and private health expenditure in a given year, calculated in national currency units at current prices. The concept of health expenditure (public), consists of recurrent and capital spending from government (central and local) budgets, external borrowings and grants (including donations from international agencies and nongovernmental organizations), and social (or compulsory) health insurance funds (WHO, 2018).

More so, Health expenditure can also mean investment in the health sector and infrastructure, spending on medical care, community health activities, prevention, rehabilitation, health administration and regulation, and capital formation which indirectly means investment in human capital and leads to human capital accumulation (Ndedi, Metha & Nisabwe, 2017). Moreover, health expenditure is considered an investment in human resources which promotes productive capacity and improves the country's economic growth.

Atuahene, Yusheng, and Bentum-Micah (2020) examined the health expenditure, CO2 emissions, and economic growth in China and India. The study employed a dynamic panel model using GMM method from 1960 to 2019. The result of the study showed that economic growth had a significant negative impact

on health expenditure in China and India, and increasing CO2 emissions were found to influence health expenditure positively. However, since the study was conducted in China and India, the findings of the study may not apply to Nigeria 's economy . Therefore , there is need to carry out similar study in Nigeria.

Raghupathi and Raghupathi (2020) carried out a study on the effect of health expenditure on the economic growth of the United States. The study analyzed data from 2003 to 2014 and employed "visual analytics based on the belief that it offers an effective tool to comprehend health -care expenditure at a national level and analyze its impact on economic performance ". The study concluded that there is a positive correlation between health -care expenditure and the economic indicators of income , GDP and labor productivity while health -care expenditure is negatively associated with the indicators of labor productivity , personal spending and GDP. The study shows that an increase in health -care expenditure has a positive relationship with economic performance . The study recommends that investing in health sector would boost income, productivity , GDP, and alleviate poverty. However, even though the study was carried out in another geographical location , therefore , the findings of the stud y may not apply to Nigeria's economy since the nature of the two economies were not the same.

Serif and Mustafa (2022) examined health expenditures (total, public and private) and per capita income in the BRICSAT : panel bootstrap causality analysis . The study aimed to determine whether there is a bidirectional causality relationship between health expenditures and per capita income in Brazil, Russia, India, China, South Africa, and Turkey (BRICSAT). Design/methodology/approach for that purpose, the 2000 –2018 period data of the variables were tested with the Konya (2006) panel causality test . Additionally , the causality relationships between public and private health expenditures and per capita income were also investigated in the study. The results of the study showed that there was no statistically signi ficant causal relationship between total health expenditures and public health expenditures to per capita income in the relevant countries. Besides, there was a unidirectional causality relationship between private health expenditures to per capita income only in Turkey . On the other hand , a unidirectional causality relationship between per capita income to total health expenditures in China, Russia, Turkey, and South Africa and from per capita income to public health expenditures in India, Russia, Turkey, and South Africa was determined . Consequently , a causality relationship between per capita income to private health expenditures was found in Russia and Turkey. Economic policy makers should make their public health investment precisely and in a way that reaches every citizen without any profit motive, the public should have serious supervisory power over the private sector in regards to pro fit making . However, the study was based on a cross-country analysis and its result was devoid of Nigeria's economy.

Rahman , Khanam , and Rahman (2018) examined health -care expenditure and health outcome nexus: new evidence from the SAARC -ASEAN region. The study concentrated on 15 developing countries of the South Asian Association for Regional Cooperation -Association of Southeast Asian Nations (SAARC -ASEAN) regions between 1995 and 2014 . The result of the study showed that economic development signi ficantly boosts the health of individuals ; therefore , both public and private health spending should be promoted . The study recommends that the health expenditure in the SAARC -ASEAN region should be increased as indicated in the result that it improved the health status of the population in the region . Public sector health funds must be appropriately and effi ciently used . Government and private institute should implement appropriate strategies to improve sanitation facilities . However , the work was a cross -country study devoid of results on the impact of public healthcare expenditure on economic growth in Nigeria.

Ahmed and Hasan (2016) analyzed the impact of public health expenditure and governance on health outcomes in Malaysia using data from 1984 to 2009. The study employed Autoregressive Distributed Lag

(ARDL) cointegration framework. The result of the study showed that a stable, long-run relationship exists between health outcomes and income level, public health expenditure, corruption, and government stability. The results also revealed that public health expenditure and corruption affect long and short-run health outcomes. To improve the quality of life in the country, the study emphasizes the importance of health programs while reducing or eliminating the corruption rate in the country. However, the timeframe of the study lack currency, and the findings of the study may no longer reflect on the current issues on the subject matter.

Dinçer and Yüksel (2018) carried out a study on identifying the causal relationship between health expenditure and economic growth in the E7 Countries. The study used the Pedroni panel co-integration method and DumitrescuHurlin panel causal analysis to examine the relationship between health expenditure and economic growth. The study found that there was a long-run relationship between public health expenditure and economic growth. However, the relationship did not hold for private health expenditure and economic growth. The results of the DumitrescuHurlin panel causality analysis found no causality relationship between health expenditure and economic growth. The study also revealed that economic growth was the primary cause of total public and private health expenditure. The study recommended the use of private health expenditure in emerging countries to drive economic growth as these countries already have a large share of government or public health expenditure. Therefore, the study was a cross-country study devoid of results on the impact of public health-care expenditure on economic growth in Nigeria. Therefore, there is a need for a study on the impact of public healthcare expenditure on economic growth in Nigeria.

Dimpna, Jehovaness and Godwin (2021) examined the effect of public health expenditure on economic growth in Tanzania using time series data from 1980 to 2017. Co-integration and Autoregressive Distributed Lag Model in Error Correction Model framework was employed in the analysis. The results revealed a significant positive effect of the lag of public health expenditure on economic growth in the short-run, while there was an insignificant effect of the relationship in the long-run. The study also found that improvement in health status has a significant positive impact on economic growth, supported by the causality results. Concerning the causality test, it was found that there was a bidirectional relationship between public health expenditure and economic growth; and between health status (infant mortality) and economic growth. This strictly signifies the effectiveness of government spending on health on economic growth, through enhancing worker productivity and output. Besides, rising household consumption expenditure was found to have a significant positive impact on boosting economic growth in Tanzania. However, the revealed insignificant long-term coefficient of public health expenditure on economic growth should not necessarily be taken as a reason to reallocate health expenditure from the health sector. Based on the findings, the study recommended that for Tanzania to sustain its economic growth, it needs to pay attention to measures that would improve the health of its citizens through allocating adequate budgetary expenditure to the health sector. Nevertheless, this has to go hand in hand with the establishment of a strong institutional system to ensure effective utilization of the allocated resources. However, the findings of the study may not be applicable to Nigeria's economy because the study was conducted in another geographical location. More so, the result of the study was devoid of government capital and recurrent expenditure.

Nicholas (2021) examined health expenditure and economic growth in sub-Saharan Africa using panel data from sub-Saharan African countries for the period 2008–2017. The study decomposed health expenditure into two components: public health expenditure and private health expenditure. To establish whether the causal relationship between health expenditure and economic growth depends on a country's

level of income , the study divided the studied countries into two groups : low-income countries and middle-income countries. To address the omission-of-variable bias, which was associated with some of the previous studies, the study incorporated life expectancy as an intermittent variable between health expenditure and economic growth – thereby creating a system of multivariate equations. Using a panel ECM-based Granger-causality model, the study found that when public expenditure is used as a proxy, a distinct unidirectional causality from health expenditure to economic growth is found to prevail in low-income countries, but no causality is found to exist in middle-income countries. However, when private health expenditure was used, a short-run causality from economic growth to health expenditure was found to prevail in middle-income countries, but no causality was found to exist in low-income countries. However, the study was based on cross-country analysis and the result of the study was devoid of country - specific like Nigeria.

Nerva (2020) carried out a study on the impact of Public Health-care Expenditure on economic growth using Bayesian Model Averaging as the method of analysis of the study. The timeframe of the study covered the period 2000 to 2018. The result of the study revealed that there was no variation in the impact of public health expenditure on economic growth between developed and developing countries. Contrary to public health expenditure , private health expenditure has a varying impact on both developed and developing countries. The study also revealed that public health expenditure has unanimously a negative effect on economic growth in both developed and developing countries. Private health expenditure, on the other hand, has a positive impact on economic growth in developed and developing countries. However, the study was cross-country in nature and therefore devoid of results on the impact of public health-care expenditure on economic growth in Nigeria. Hence, the need for a study on the impact of public health-care expenditure on economic growth in Nigeria.

Narayanl (2020) investigated the short-term and long-term effect of health care expenditure, institutional quality, and domestic and foreign investment on the economic growth of South Asia Countries during the period 1996-2018. The study used OLS estimation with a random effect model and cointegration to test the short-term and long-term relationship. The study found that there runs a bidirectional causality from health expenditure to economic growth in the short run. The study recommended that South Asia nations require strengthening the accessibility towards affordability , and accountability of the health care services being provided by the population. Although institutional quality was used in the study, the study showed no result on the effect of institutional quality on economic growth. Hence, our study will use control of corruption vis-à-vis government expenditure instead of institutional quality to analyze its effect on economic growth in Nigeria from 1996 to 2021.

Relationship between Economic Growth and Public Health Expenditure

Health expenditure as it relates to the economy of different countries has been a topic of much research (Zaman, Hossain, Mehta, Sharmin, & Mahmood, 2017). There is a lot of literature about the relationship between economic growth and health expenditure; however, results vary across different studies. Ndedi, Metha , and Nisabwe (2017) found that by increasing expenditures on health , countries , such as Cameroon, can increase their economic growth rate. On the contrary, some studies have found a negative correlation between GDP per capita and household expenditures. Sachs (2001), for instance, found that in developing countries that have high health-care consumption and spending , there is a decrease in GDP per capita.

Besides, the relationship between health and economic growth has been firmly established in the

literature. Ginsburg (2008) conducted a study revealing positive associations between health-care investment and an economy's growth, particularly in developing countries. Bloom, Canning, and Sevilla (2004) concurred that healthcare investment represents a significant form of human capital and that better health improves employee productivity and the physical capacity of the population.

To put it another way, an economy's output is determined by its workers' productivity, with production and productivity increasing together. Workers' productivity is defined as the value created per unit of work output, which depends on both human capital and technological capacity, with the former representing the aggregate knowledge and skill set that an economy's workers possess (Bloom, Canning, & Sevilla, 2004). As such, a high proportion of workers with a high level of education correspond to higher human capital and productivity.

Theoretical Paradigm

Wagner's Law, Adolph Wagner (1883)

Wagner (1883) postulates that government expenditure increases as a result of industrial and economic growth in a country. This theory argued that there is both an absolute and a relative expansion of the public sector at the cost of the growth in the private sector. This is based on the assumption that during an industrialization process, as the real income per capita of a country increases, the share of public expenditure is also expected to increase (Serena & Andrea, 2011; Babatunde, 2011). This suggests that the development in the industrial sector of a country will be accompanied by increased government expenditure. Therefore, increased government expenditure (recurrent or capital) occurs to maintain the industrial and growth process. Bird (1971) justifies this postulation based on three pieces of evidence: the administrative and protective functions of the government require huge capital expenditure outlay; the need for increased provision of social and cultural goods and services as the industrial sector grows and the need for government expenditure to manage and finance natural monopolies and ensure smooth operation of the market forces.

Keynesian Theory

The Keynesian theory (1936) of public expenditure argues that economic growth occurs as a result of rising public sector expenditure. In this context, government expenditure is treated as an independent exogenous variable and could be used as an efficient policy variable to influence economic growth. According to the Keynesian school of thought, public spending boosts economic activities as well as acts as a tool to stabilize the short-run fluctuations in aggregate expenditure (Ju-Haung, 2006). This view is consistent with the evidence found in some previous empirical studies such as (Omoke, 2009) which show a positive impact of government expenditure on economic growth. The Keynesian macroeconomic model advocates active government intervention in the economy through an increase in government spending, and money supply in order to stimulate the demand for goods and services during periods where there is a lack of demand (low demand) and put the unemployed back to work.

Endogenous Growth Theory

The advocate of endogenous theory can be attributed to the works of Arrow (1962), Hirofumi and Uzawa (1965), and Lucas, (1988). However, the Endogenous growth theory holds that economic growth is primarily the result of endogenous and not external forces (Romer, 1994). Endogenous growth theory holds that investment in human capital, innovation, and knowledge are significant contributors to

economic growth. The theory also focuses on positive externalities and spillover effects of a knowledge-based economy which will lead to economic development . The endogenous growth theory primarily holds that the long-run growth rate of an economy depends on policy measures. For example, subsidies for research and development or education increase the growth rate in some endogenous growth models by increasing the incentive for innovation.

Methodology

This study is to determine the effect of government health expenditure on economic growth. The ex-post facto research design was employed in this study since the data for the variables used in the study cannot be manipulated by the researcher (Anigbo, 1997). Economic growth was used as the dependent variable whereas government health expenditure, government expenditure on education and life expectancy were used as the independent variables. The data for this study was sourced from the World Bank and Central Bank of Nigeria (CBN) statistical bulletin for the period 1990 to 2021. More so, the unit root tests such as Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) tests were used to check for stationarity of the time series data to be used for the study. Therefore, the estimation will be carried out using econometric software E-view 9.0.

Model Specification

This study adopts and modifies a simple form of economic growth function model used by Dimpna et al. (2021) which was based on a Cobb-Douglas production model. Hence, following the Cobb-Douglas production model (1928), an economic growth model is specified as

$$Y_t = f(K_t, A_t, L_t) = K_t^{\alpha} (A_t, L_t)^{1-\alpha} \quad (1)$$

Where Y = aggregate real output, K = Capital stock, A = Efficiency factor, L = Labour force, $\beta = 1-\alpha$.

Since human capital contributes positively to economic growth and following Odusola (2002) and as adopted in Olubokun and Bakare (2011), therefore, the model in equation (1) is re-specified as thus

$$Y_t = K_t^{\alpha} H_t^{\beta} (A, L) \quad (2)$$

Where H = human capital. Again, an improvement in health care programmes through adequate financing schemes enhances physical and mental capabilities and thus improves productivity. Therefore, it is logical to proxy the human capital variable with government health expenditure. The natural log linear transformation of model in equation (2) is specified as thus

$$\ln Y_t = \alpha \ln K_t + \beta \ln H_t + \ln(A_t L_t) \quad (3)$$

In these equations α, β, and are taken as constants and are interpreted as elasticities in equation (3).

For the present case of the interaction between government health expenditure and economic growth, a measure of economic growth using the real GDP which serves as the dependent variable is adopted. This seems to have controlled for inflation uncertainty thereby explaining the real value of money. The key independent variables are the government health expenditure, government expenditure on education, and life expectancy.

On the basis of equation (3), that is, $\ln Y_t = \alpha \ln K_t + \beta \ln H_t + \ln(A_t L_t)$, the estimating equation is derived. In principle, equation (3) is re-specified as thus

$$\ln Y_t = \phi + \alpha \ln K_t + \beta \ln H_t + \ln A_t + \varepsilon_t \quad (4)$$

However, this study has earlier taken A_t to be the efficiency factor. In this case, since education may tend to facilitate health care through provision of the required health care training as earlier discussed, it thus serves as an efficiency factor and then may represent the *A*. Hence, (4) is re-specified to reflect the variables used in this study by proxy Y to GDP, K to life expectancy, H to GHE, A to GEE. Hence, the model in equation (4) is re specified as thus

$$InRGDP_t = \pi + \beta InGHE_t + InGEE_t + jInLEX_t + \varepsilon_t \quad (5)$$

$$GDP = f(GHE, GEE, LEX)$$

Where

In*GDP* = Natural log of Real Gross Domestic Product

InGHE = Natural log of Government Health Expenditure

InGEE = Natural log of Government Expenditure on Education

InLEX = Log of Life Expectancy e = Error terms

π = Constant

$\alpha, \beta, ,j$ = elasticity coefficients

The model has been expressed in logarithms to take care of outliers and to express the estimated parameters either as elasticities, percentage changes, or propensities, among others.

Results

The attempt to empirically examine the relationship existing between government health expenditure and economic growth in Nigeria, led the researcher to subject the data collected to unit root test and Auto-regressive distributed lag (ARDL) model. The variables considered in this research work are: gross domestic product (GDP-dependent variable) and the independent variables include government health expenditure, government expenditure on education and life expectancy. The empirical results are presented below:

Unit Root Test

In order to test for the presence or absence of unit root in the data used for the empirical analysis, Augmented Dickey-Fuller (ADF) test was employed and the test results are as presented below:

Table 1: Results of Augmented Dickey-Fuller Unit Root Test

	Level			**First Difference**			Remark
Variables	t-Statistics	5% critical value	p-value	t-statistics	5%-critical value	p-value	
LGDP	-5.061142	-2.960411	0.0003	-3.271888	-5.061142	0.0003	I(0)
LGEH	-1.143477	-2.960411	0.6855	-9.419152	-2.963972	0.0000	I(1)
LGEE	-3.979834	-2.981038	0.0053	-3.979834	-2.981038	0.0053	I(0)
LEX	-2.730749	-2.976263	0.0820	-3.105608	-2.963972	0.0369	I(1)

Sources: **Researcher's computation from E-view 9**

Table 2: Results of Phillips Perron Unit Root Test

	Level			**First Difference**			Remark
Variables	t-Statistics	5% critical value	p-value	t-statistics	5%-critical value	p-value	
LGDP	-4.852345	-2.960411	0.0005	-4.852345	-2.960411	0.0005	I(0)
LGEH	-0.927670	-2.960411	0.7657	-11.24042	-2.963972	0.0000	I(1)
LGEE	-4.290783	-2.960411	0.0211	-4.290783	-2.960411	0.0211	I(0)
LEX	1.426526	-2.960411	0.9987	-3.059602	-2.963972	0.0407	I(1)

Sources: **Researcher's computation from E-view 9**

The Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root test presented in table 1and 2 above, revealed that the gross domestic product and government expenditure on education were stationary at level whereas government expenditure on health and life expectancy were stationary at first difference. This unit root test result therefore revealed the existence of a mixed order of integration among the variables of the study. The mixed order of integration from the unit root test results implies the possibility of long-run relationship among the variables of the study, though further investigations using ARDL – Bound test result will reveal if actually long run relationship exist among the variables of the study.

ARDL Bounds Test

The bound test is used to examine whether the variables are co integrated. The variables are said to be co integrated if the F-statistics is greater than the critical values and otherwise if it is less. The result of Bounds test is presented in the Table 3 as follows:

Table 3: ARDL Bounds Test

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	11.84295	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: Researcher's compilation from E-view 9

The results of the ARDL bounds test presented in Table 3 above shows that a long-run relationship exists between government health expenditure and economic growth in Nigeria within the period of the study. The result also disclosed that the computed *F*-statistic exceeds the upper critical value at 5% level of significance, which implies that government health expenditure and economic growth in Nigeria are co integrated in the long run at 5% level of significance. This is as a result of the fact that the value of the F-statistic as presented in table 3 above which has the value of 11.84295 is greater than the value of the upper bound boundary of 4.35at 5% level of significance. To this end, the hypothesis of no long-run relationship existing between government health expenditure and economic growth is rejected at a 5% level of significance.

Long Run Results

The long run relationship between government health expenditure and economic growth in Nigeria is accessed by the lower part of the result of Autoregressive Distributed Lagged (ARDL). The result is presented as follows in the Table 5:

Table 5: ARDL Long -run Coefficients Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LGEH	0.295029	0.111071	2.656224	0.0156
LGEE	0.206536	0.118209	1.747221	0.0967
LEX	0.146693	0.019275	7.610602	0.0000
C	0.772965	0.982204	0.786970	0.4410

Source: Researcher's compilation from E-view 9

Table 5 above reveals the long-run coefficients test results of the ARDL model for which the variables under consideration were estimated. From the results, government health expenditure has a positive and significant impact on gross domestic product; whereas government expenditure on education has a positive and insignificant impact on gross domestic product. Similarly, life expectancy exerts positive and significant influence on gross domestic product in the long-run in the economy in Nigeria.

In the same vein, these claims are supported by the p-values and coefficients of the variables estimated from the ARDL long-run coefficients test. From the results, the coefficients of LGEH, LGEE and LEX are 0.295029, 0.206536 and 0.146693 respectively and their p-values include 0.0156, 0.0967 and 0.0000 respectively.

Policy Recommendations

The study makes the following recommendations:

1). Since the study discovered that government expenditure on health exerts positive and significant effect on economic growth in Nigeria both in the short-run and the long-run, government should ensure that budgetary allocation to health sector is judiciously utilized in order to meet the health needs in Nigeria. This will go a long way to promote economic growth in Nigeria.

2). Since the analysis revealed that government expenditure on education has a positive and significant

effect on economic growth in the short-run; and in the long-run, it exerts positive and insignificant influence on gross domestic product proxied for economic growth , government should increase budgetary allocation to the educational sector to reflect UNSCO recommendations of 26 percent of the national budget and 6 percent of the gross domestic products (GDP) for developing country like Nigeria. This will boost funding which will invariably translate to improvement in quality of human capital in Nigeria.

3). Having unraveled that life expectancy has a positive and significant impact on gross domestic product proxied for economic growth in Nigeria in both the short-run and the long run, the government should increase the amount of its expenditure on the health sector to meet up to the 15% threshold as it's discovered from the empirical result that it enhances improvement in life expectancy . This is a major way to guarantee tremendous improvement in the life expectancy and also warrants reduction in the mortality rate in Nigeria.

Conclusion

The study examined the effect of government health expenditure on economic growth in Nigeria for the period 1990-2021. Autoregressive distributed lag (ARDL) model is the method of analysis utilized in the investigation . The variables modeled in the research include gross domestic product , government expenditure on health, government expenditure on education and life expectancy.

The results of the ARDL model revealed presence of equilibrium long-run relationship among the variables used in the study. The results estimated indicated that government expenditure on health has a positive and significant effect on gross domestic product both in the short-run and the long-run. The results also showed that government expenditure on education has a significant and positive effect on gross domestic product in the short-run while in the long-run, it has a positive and insignificant impact on gross domestic product in Nigeria . In the same vein , the results showed that life expectancy exerts positive and significant impact on gross domestic product in both the short-run and long-run.

Thus, the study recommends that government should ensure that budgetary allocation to both health and educational sectors are improved, strengthened and judiciously utilized in order to guarantee tremendous improvement in the life expectancy which will also cause reduction in the mortality rate, and thereby promote economic growth in Nigeria.

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