CHAPTER TWO

EDUCATION & HEALTH EXPENDITURES IN NIGERIA: IMPLICATIONS FOR SUSTAINABLE DEVELOPMENT GOALS

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1.1 INTRODUCTION

Economic growth is attained through the productive use of all resources, including labour, this result in greater per capita income and improvement in people's average standard of living (World bank, 2004). It has also been argued that meaningful human development depends on policy choices including access to income and employment opportunities, educational and healthcare services as well as clean and safe physical environment. Human capital theory suggests that society and individuals derive economic benefits from investments in people (Oluwatobi and Ogunrinola, 2011). Education and health play a central role in economic development (Dauda, 2004). They play a central role in development process. No country has successfully achieved continuous growth without significant investment in human capital (Adelowokan, 2012). The effect of government expenditure spending on human capital development is still an unsolved issue both empirically and theoretically. Quite recently the wealth of a nation is now being measured in terms of human capital and not the stock of physical capital only, as an independent factor of production required to accomplish high and sustainable labour productivity.

Economic development theorists, especially the neo-classicalist are of the opinion the development in human resources generally has a significant impact on economic growth and development. They opined that the quality and quantity of labour determine production (Okoro 2015). Welfare, being an important indicator for growth and development as given by the Human Development Index (HDI) has identified education and health as one of its measures. Education, good health and longevity are also fundamental inputs for productivity assistance affordable for all the population of countries. Stagnation has been noticed in many developing countries both in health and education expenditure per capita and economic development, Doucouliagos (1997) has noted human capital as a source to motivate workers, boost up their commitment and create expenditure in research and development (R&D) and eventually pave way for the generation of new knowledge for the economy and society at large.

1.2 Statement of the Problem

Despite the seemingly low percentage which the health and education sectors are allocated annually, large sums of money for spending are still made available for these sectors. Yet the results shown have been quite disappointing. Nigeria, acknowledged as the most populous country in African is blessed with vast human material resources. Yet, poverty as at 2010 was given to be approximately 69.1% (Nasiru and Usman 2012) while the human poverty index stood at 46.0%). Similarly, approximately 64.4% of Nigerians live below income poverty line of U.S$1.25 a day. Similarly, Menizibeya (2011) labeled Nigeria as one of the most poverty entrapped economies in the world with poor human welfare status. These results thus show that the growth in social expenditure is yet to be reflected on citizen's welfare. Menizibeya (2018) retreated in his work as read in (Menixibeya 2011) that in 2010, out of the approximately 163 million Nigerians, 53.8% constitute economic active group compared to an average annual increase from 52.2% in 1980-2001 to 53.7% in 2001-2018. This statistics indicates that the

evidence of the deplorable state of Health and Education is made known with poor and degenerated educational facilities, low ranking, mass graduation with low prerequisite skill, incessant strikes, and brain drains, poor medical service and facility, high infant mortality, low life expectancy and the increased rate of travelling for better medical service. This situation now calls to question the government's position in making these all important sectors the pivotal for economic growth and development in the country and this can be done by considering the government's contribution to input and not just the outputs measured in terms of life expectancy and literacy rates and their contribution to growth.

1.3 Objectives of the Study

The main objective of the paper is to examine the impact of government education and health expenditure on economic growth in Nigeria. The specific objectives include:

i. To determine the impact of government health expenditure on Gross Domestic product in Nigeria
ii. To examine the impact of government education expenditure on Gross Domestic Product in Nigeria
iii. To investigate the causal relationship existing between health expenditure and Gross Domestic Product in Nigeria
iv. To investigate the causal relationship existing between education expenditure and Gross Domestic Product in Nigeria

1.4 Operational Hypotheses

i. $H_0$1**:** Government Expenditure on health has no significant impact on Gross Domestic Product in Nigeria
ii. $H_0$2**:** Government Expenditure on Education has no significant impact on Gross Domestic Product in Nigeria
iii. $H_0$3**:** There is no causal relationship between health expenditure and Gross Domestic Product in Nigeria
iv. $H_0$4**:** There is no causal relationship between Education expenditure and Gross Domestic Product in Nigeria

2.1 Conceptual Framework

2.1.1 Concept of Public Expenditure

Public expenditure consists of expenditure by central government, state governments and local authorities (such as municipalities and public corporations), with central government accounting for the major portion of such expenditure. The government is required to maintain good roads, bridges, defense activities, canals and harbors, to protect trade, to maintain the coinage and to provide social security, education and religious instruction. There are different classifications of government expenditure. There is consumption expenditure and investment expenditure. Government investment expenditures are government capital expenditure made to obtain capital goods such as expenditure on defense, education, health, transportation, road, railways and airports). Government consumption expenditures are mostly expenditure on recurrent activities and services; that is, expenditure made to meet up with the day to day running of government business.

Government expenditure is also classified as capital expenditure and recurrent expenditure. Government capital expenditure is the money spent on goods that are classified as investment goods. This means spending on things that last for a period of time. This may include investment in schools, hospitals, power sector, telecommunication and road construction. Capital expenditure is the part of the government spending that goes into the creation of assets like schools, colleges, hospitals, roads, bridges, dams, railway lines, airport and seaports. Capital expenditure also covers the acquisition of equipment and machinery by the government, including those for defense purpose. Capital

expenditure also includes investment by the government that yields profits or dividend in future. On the other hand, government recurrent expenditure refers to a type of spending that does not result in acquiring fixed assets in a country or business. They are all the regular payments and expenses used to maintain and run a country. It also refers to all fees, exclusive of capital forms of payment. Included in government recurrent expenditure are salaries and wages, employee allowances, operational cost like water bills, electricity, accommodation, travelling, telephone, cost of maintaining equipment, and installation and funds used in covering costs of compulsory obligations.

2.1.2 Public Recurrent Expenditure on Health and Education

This includes all payments other than for capital assets to the education and health sectors. These include wages and salaries, employer contributions, interest payments.

2.1.3 Capital Expenditure on Health and Education

These are government payments for acquisition of fixed capital assets, stock, land or intangible assets on health care and education. A good example would be building of schools and hospitals. However, it is important to note that much donor-funded "capital" expenditure, through referring to projects, includes spending on non-capital payments.

2.1.4 Economic Growth and Development

Historically, the study of economic growth can be traced back to 1776, when Adam Smith published the wealth of nations. Since then, both classical and neo-classical economists including David Ricardo, Karl Marx, Schumpter and J. M. Keynes have all made outstanding contributions to the study of economic growth. Today, economists and politicians from both rich and poor countries of different ideological shades have shown much interest and attention to the importance of economic growth.

Economic growth and development are sometimes used interchangeably but there is a fundamental distinction between them. Economic growth is defined informs of increase in nations output of goods and services as measured by Gross Domestic Product (GDP). Kuznets (1971) defined a country's economic growth as a "long term rise in capacity to supply increasing diverse economic goods to its population. This growing capacity is based on advancing technology and ideological adjustment that it demands". Economic growth, therefore, encompasses growth, structural and institutional changes and the essential elements that make up life such as education, health, nutrition and a better environment, that is human and development indices. Development, on the other hand, is an important process in every human society and it has remained the goal of every society at all times. Development is growth coupled with social justice.

2.1.5a Human Capital Theory

Human capital theory (Woodhall, 1997; Becker, 1993) rests on the assumption that formal education is highly instrumental and necessary to improve the productive capacity of a population. In short, human capital theorists argue that an educated increases the productive population. Human capital theory emphasizes that education increases the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings. The provision of formal education is seen as an investment in human capital, which proponents of the theory have considered as equally or even more worthwhile than that of physical capital (Woodhall, 1997). Human capital theory concludes that investment in human capital will lead to greater economic output.

2.1.5b Theories of Economic Growth

The Classical Approach

Adam Smith laid emphasis on increasing returns from investment as a source of economic growth. He focused on foreign trade to widen the market and raise productivity of trading countries. Trade enables

a country to buy goods from abroad at a lower cost as compared to which they can produce in the home country. In modern growth theory, Lucas has strongly emphasized the role of increasing returns through direct foreign investment which encourages learning by doing through knowledge capital.

The Neoclassical Approach

The neoclassical approach to economic growth has been divided into two sections; the first section is the competitive model of Walrasian equilibrium where markets play a very crucial role in allocation the resources effectively. To secure the optimal allocation of inputs and outputs, markets for labour, finance and capital have been used. This type of competitive paradigm was used by Solow to develop a growth model. The second section of the neoclassical mode assumes that technology is given. Solow used the interpretation that technology in the production function is superficial. It points that R&D investment and human capital through learning by doing were not explicitly recognized. The neoclassical growth model developed by Solow fails to explain the fact of actual growth behaviour. This failure is caused due to the model's prediction per capita output approaches a steady state path along which it grows at a rate that is given. This means that the long-term rate of national growth is determined outside the model and is independent of preferences and most aspects of the production function and policy measures.

2.2 Empirical Issues

The relevance of investments on education and health in the development process of an economy for sustained growth is increasing in a frightening rate. Education and health at all levels have been identified to contribute to economic growth of a nation. It is worth-noting that the significance of the educational system to labour market would highly depend on its ability to produce literate, disciplined, flexible labour force vis-à-vis high-quality education. Investing in health offers high return in terms of economic growth. It means that increasing expenditure on health services do not only have a larger impact on poverty per naira spent, but also enhance growth in human productivity. This is because as more people get good health, they will carry out their duties for better productivity which will enhance economic growth. Adehola (2014) employed econometrics method to conduct regime analysis of the relationship between public investment in human capital and economic growth in Nigeria for the period (1961-20121). Todaro (1977) assert that development is reduction or elimination of poverty, inequality and unemployment within the context of a growing economy. Pearce Warford (1993) defined economic development as achieving a set of social goals. Since social goals are bound to change over time, economic development is likely to experience some extent of process. He identified two sets of changes combination which could occur in any economic developmental process. These changes are advance in utility; a major factor contributing to advance in wellbeing in real income per capital and advance in the realms of educations, health and general quality of life.

Goulot (1971) argued that economic development involves advance in skills, knowledge, capacity and choice. The shift of factor of production from low productive to more productive activities will certainly increase total output through, an increase in the economic efficiency of the system. This form of economic growth is of a great importance to a developing economy like Nigeria. For instance, labour can be removed from agriculture without any reduction in the volume of agricultural production and shifted to industry, with a resultant net gain. Oluwatobi and Ogunrinola (2011) used augmented slow model relationship between human capital development and economic growth in Nigeria. Findings from the study reveals that there exists a positive relationship between government recurrent expenditure on human capital development and the level of real output, while capital expenditure is negatively related to the level of real output. The study recommends appropriate channeling of the nation's capital expenditure on education and health to promote economic growth.

METHOD

3.1 Research Design

The research design employed in this study is the ex-post facto and econometric method. An ex-post facto design is a quasi-experimental study that examines how independent variables present in the study affect the dependent variable.

3.2 Data and Sources

This study makes use of annual secondary data for the period 1981-2020. The data used were sourced from the publication of central Bank of Nigeria (CBN) statistical bulletin and World Bank Development Indicator (WDI-online).

3.3 Method of Analysis

The technique of data analysis used in this study includes the unit root test, cointegration test, error correction model (ECM), causality test and ordinary least squares (OLS) method of estimation.

3.4 Model Specification

The model is anchored on the Human Capital Theory (HCT). The theory concludes that investment in human capital will lead to greater economic outputs. The model of this study is built based on the determinants of economics growth specified in economic theory.

The functional form of this model is given as:

RGDP = F (RHX, REX, LITR, LER) ---------- (1)

Where:

RGDP = Real Gross Domestic Product (proxy for economic growth)
RHX = Expenditure on Health (a proxy for health expenditure)
REX = Expenditure on Education (a proxy for expenditure on education)
LITR = Literacy Rate (a proxy for the outcome of government expenditure on education)
LER = Life Expectancy Rate (a proxy for the outcome of government expenditure on health).

When equation (1) is expressed in mathematical form, it becomes;

$RGDP = a_0 + a_1RHEX + a_2REX + a_3LITR + a_4LER$ ---------- (2)

Where:

a_0 is the intercept of the model
$a_1 - a_4$ is the slope of the regression or the behavioural parameters

The econometric form of the above equation is given as;

$RGDP = a_0 + a_1RHEX + a_2REX + a_3LITR + a_4LER + Ut$ ---------- (2)

Where:

U_t is stochastic error terms for the model which capture unexplained influences on Real Gross Domestic Product (RGDP) that are not included in the model.

On apriori expectation; a_0 to $a_4 > 0$

DATA ANALYSIS AND RESULTS

4.1 Data Analysis

Due to the stochastic trend process associated with most time series data, it is important that these series are tested for the presence of unit root or stationary. The unit root (or stationary) test was conducted using Augmented Dickey Fuller (ADF) test. The result of the ADF test is shown in table 1.

Table 1: Unit Root Test Result

Variables	ADF Statistical @ level	Critical value 5%	ADF statistical @ first differences	Critical value 5%	Order of integration
RGDP	-1.770165	-2.945842	-11.5576	-2.45842	**1(1)**
RHEX	-3.957647	-2.943427	-6.429540	-2.948404	**1(1)**
REX	-1.312356	-2.943427	-6.860522	2.945842	**1(1)**
LER	-1.073973	2.943427	-3.122941	-2.948404	**1(1)**
LITR	-2.017126	-2.943427	-5.164910	-2.945842	**1(1)**

Source: Authors Computation Using E-Views 10 Outputs

The unit root (or stationarity) test was conduct using Augmeted Deckey Fuller (ADF) test. The result of the ADF test shows that education expenditure, literacy rate, RGDP and Health Expenditure were stationary at first difference 1(1).

4.1.1 Co-integrations Test

The variables were subjected to co-integration test to determine whether they are co-integrated (i.e. whether there is a long-run relationship between them). Both Trace value and Maximum Eigen values indicate one co-integrating equation at 5% level of significance. This is shown in the table below.

Table 4.3 Co-integration Test Result

Date: 02/04/22 Time: 13:40
Sample (adjusted): 3:39
Included observations: 37 after adjustments
Trend assumption: Linear deterministic trend
Series: RGDP RHEX REX LER LITR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.848331	170.9364	69.81889	0.0000
At most 1*	0.690172	101.1524	47.85613	0.0000
At most 2*	0.595433	57.79810	29.79707	0.0000
At most 3*	0.460070	24.31535	15.49471	0.0018
At most*	0.040032	1.511637	3.841466	0.2189

Trace test indicates 4 cointegratingeqn(s) at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.848331	69.78400	33.87687	0.0000
At most 1*	0.690172	43.35428	27.58434	0.0002
At most 2*	0.595433	33.48274	21.13162	0.0006
At most 3*	0.460070	22.80372	14.26460	0.0018
At most*	0.040032	1.511637	3.841466	0.2189

Max-eigenvalue test indicates 4 cointegratingeqn(s) at the 0.05 level
*denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Author "Computation Using E-View 10 Outputs.

The result in table 4.3 shows that the trace value and maximum Eigen value indicate four co-integrating equation at a 5% level of significance. This is shown the value of the co-integrating likelihood ratio compared with 5% critical value. Hence, the variables are co-integrated which implies that there is a long run relationship between the variables in the model.

4.1.3 Errors Correction Model Result (ECM)

Since the variables in the model are co-integrated, there is need to capture the speed of adjustment in the model, hence, the next step is to estimate the short-run dynamic within the error correction model (ECM) in order to capture the speed of adjustment to equilibrium in the case of any shock in any of the independent variable of the models. The error correction model result is presented in the table below

Table 4.4 Error Correction Model (ECM) Result

Dependent Variable: D(RGDP)
Method: Least Squares
Date: 02/04/22 Time: 22:48
Sample (adjusted): 4:40
Included observations: 37 after adjustments

Variable	Coefficient	Std. error	t-Statistic	Prob.
D(RHEX(-1)	1430.311	346.0336	4.133446	0.0003
D(REX(-1))	-13.17276	10.26603	-1.283140	0.2090
D(LER(-1))	-0.237867	2.888120	-0.082360	0.9349
D(LITR(-1))	-13.43360	54.32692	-0.247273	0.8063
ECM(-1)	-0.158944	0.068399	2.323789	0.0269
R-squared	0.200622	Mean dependent var		1470.436
Adjusted R-squared	0.071691	S.D. dependent var		1522.965
S.E. of regression	1467.359	Akaike info criterion		17.56771
Sum squared resid	66747379	Schwarz criterion		17.82894
Log likelihood	-319.0026	Hanna-Quinn criter		17.65980
F-statistic	1.556035	Durbin-Watson stat		1.051845
Prob(F-statistic)	0.201654			

Source: Authors "Computation Using E-Views 10 Output

The Error correction term in the model met the required conditions. Negative sign and statistical significance of the error correction coefficients are necessary conditions for any disequilibrium to be corrected. In light of this, the coefficient of ECM (-1) in the model is -0.158944. the coefficient indicated that the speed of adjustment between the short-run dynamics and the long run equilibrium in the first model is 1.5%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium annually in the model.

4.1.4 Ordinary Least Square

Table 4.5 Ordinary Least Square (OLS) Result

Dependent Variable: D(RGDP)
Method: Least Squares
Date: 02/04/22 Time: 22:48
Sample (adjusted): 1:39
Included observations: 39 after adjustments

Variables	Coefficient	Std. error	t-Statistic	Prob.
C	34830.03	2634.693	13.21977	0.0000
RHEX	10.46305	47.49770	0.220285	0.8270
REX	54.52577	29.36778	1.856653	0.0720
LER	-5.930695	3.369067	-1.760337	0.0873
LITR	310.9221	53.50982	5.810562	0.0000
R-squared	0.952548	Mean dependent var		34692.46
Adjusted R-squared	0.946965	S.D. dependent var		20240.02
S.E. of regression	4661.126	Akaike info criterion		19.85111
Sum squared resid	7.39E+08	Schwarz criterion		20.06439
Log likelihood	-382.0967	Hanna-Quinn criter		19.92763
F-statistic	170.6281	Durbin-Watson stat		0.481329
Prob(F-statistic)	0.000000			

Source: Authors' Computation Using E-Views 10 Output

From the Regression Analysis Computed with the aid of E-veiw 10 by prediction equation of the dependent and independent variables is presented below;

LRGDP = 34830.03 + 10.46305RHEX + 54.52577REX – 5.930695LER + 310.9221LITR

The value of the intercept is -3.200654. This shows that economic growth (proxied by RGDP) will increase by N34830.03 billion in the absence of the independent

Where also α = level of significant

N = sample size = 40

K = number of parameter = 5

N-K = degree of freedom = 40-5 = 35

Therefore T-tab = $T_{0.25(40-5)} = T_{0.025(35)}$

Using student T-test table;

T-tabulated = 2.042

Table 4.6: Summary for student T-test

Variables	T-calculated	T-tabulated	Decision rule	Conclusion
RHEX	0.220285	±2.042	Accept H_0	Not significant
REX	1.856653	±2.042	Accept H_0	Not significant
LER	-1.760337	±2.042	Accept H_0	Not significant
LITR	5.810562	±2.042	Reject H_0	Significant

Source: Authors "Computation Using E-Views 10 Output

F-test

The F-statistics test the overall significance of the model. The F-statistics calculated value of 20.53117 is greater than the critical value of 2.92 at a 5% level of significance. It means that the explanatory variables have joint impact on the dependent variable.

Decision Rule

Reject H_0 if F-calculated>F-tabulated, otherwise accept.

Thus, F-tabulated = $F\alpha$ (k-1)(n-1)

α = level of significance = 0.05

N = sample size = 40

K = number of parameters = 5

DF = V_1/V_2

Where;

DF = Degree of Freedom

$V_1 = K – 1 = 5 – 1 = 4$

$V_2 = N – k = 40 – 5 = 35$

Using F-Distribution table;

F-Tabulated = 2.04

F-Calculated = 170.6281

Based on our decision rule, since F-cal>F-tal (i.e. 170.6281>2.33) we reject the null hypothesis and conclude that the variables used in the model are statistically significant.

Coefficient of Determination (R^2)

The coefficient of determination value (R^2) which shows the explanatory power of the model is 0.952548, which shows that the model has a good fit. It implies that about 95% of the total variation in the dependent variable is explained by the independent variables. The remaining 5% can be accounted for by the error term, that is, all other explanatory variables not captured in the model.

4.2 Analysis of Result Based on Econometric Criterion

Auto Correlation

This is aimed to ascertain if the error terms are correlated. To do this, we assume that the values of the random variable are temporarily independent by employing the technique of Drbin-Watson (DW) statistics

Decision Rule

If, dw<dl, reject H_0 (positive autocorrelation)
If,dw>4-dl, reject H_0 (negative autocorrelation)
If, du<dw<4-du accept H_0 (no autocorrelation)
If, dl<dw<du reject H_0 (test is inconclusive)
If, 4-du<dw<4-dl reject H_0 (inclusive)
Where; dl = Lower Limit
Du = Upper Limit
Dw = Durbin-Watson statistic at 5% level of significant
From our regression result presented in Table 4.5;
N = 40 (number of observation)
K = 5 (number of explanatory variables)
Reading from Durbin – Watson table, at 0.05 level of significant
dl = 1.104
du = 1.932
dw = 0.481329
Compatibility: dw<dl, reject H0 (positive autocorrelation)
(i.e. 0.481329<4-1.939)
Conclusion: Based on our decision rule, we reject the null hypothesis and conclude that there is a positive autocorrelation in the model.

4.2.1 Granger causality test

Table 4.8 Granger causality test result

Pairwise Granger Causality Tests
Date: 02/04/00 Time: 23:05
Sample: 1 41
Lags: 1

Null hypothesis	Obs	F-Statistic	Prob.
RHEX does not Granger cause RGDP	40	18.4238	0.0001
RGDP does not Granger cause RHEX		11.1196	0.0020
REX does not Granger cause RGDP	40	9.24486	0.0043
RGDP does not Granger cause REX		8.89243	0.0050
REX does not Granger cause RHEX	40	6.77280	0.0132
RHEX does not Granger cause REX		1.70282	0.2000

Source: Authors computation using E-views 10

From the Granger causality treat result above, there exist a bidirectional causality between RHEX and RGDP since their probability values are less than 0.05% level of significance. This implies that health expenditure Granger causes economic growth and Vice-versa. The result also shows that there exist a bidding relationship between REX and RGDP implying that education expenditure causes economic growth and vice-versa. As observed in the result above, there is a unidirectional relationship between REX and RHEX as causality runs from education expenditure to health expenditure; however health expenditure does not Granger cause education expenditure.

4.3 Hypothesis Testing

H_o1: Government expenditure on health has no significant effect on economic growth in Nigeria

H_o2: Government expenditure on education has no significant effect on economic growth in Nigeria.

H_o3: There is no causal relationship between health expenditure and economic growth in Nigeria.

H_o4: There is no causal relationship between education expenditure and economic growth in Nigeria.

Hypothesis one and two stated above will be tested using the probability values obtained in the regression model while hypothesis three and four was tested using probability values obtained in the Granger causality test result.

Decision Rule:

Accept H_o, if p-value>0.05 level of significance. Otherwise, reject H_o

In testing hypothesis one the p-value is greater than 0.05% of level of significance (i.e. 0.8270>0.05), thus, we accept the null hypothesis and conclude that government health expenditure has an insignificant impact on economic growth in Nigeria. Also, the p-value of education expenditure is greater than 0.05% of level of significance (i.e. 0.0720>0.05). Therefore, we accept the null hypothesis and conclude that government expenditure on education has no significant impact on economic growth in the period under study. For hypothesis three, there is a bidirectional causality between health expenditure and economic growth since their probability values are less than the chosen 5% level of significance (i.e. 0.0001, and 0.0020<0.05), thus, we reject the null hypothesis and conclude that government health expenditure in Nigeria in the period under study. Also, there exist bidirectional causality between education expenditure and economic growth in Nigeria since their probability values are less than the chosen 5% level of significance.

5.1 Summary of the Findings

The study examines the impact of government education expenditure and government health expenditure on economic growth in Nigeria from 1981 to 2021. The study adopts the unit root test, co-integration, error correction method (ECM), causality test, Normality test and Ordinary Least Square (OLS) test methods. The data used for this study were tested using Augmented Dickey-Fuller to ascertain that stationarity of the variables. All the variables were found stationary at first difference. The result of the co-integration test indicates four co-integrating equation at a 5% significant level with assumption of linear deterministic trend in the data. This is shown by the value of the co-integrating likelihood ratio compared with 5% critical value. Hence, the variable were co-integrated which implies that there is a long run relationship between RHEX, REX, LITR, LER and RGDP. The error correction term in the model met the required conditions. Negative sign and statistical significance of the error correction coefficients are necessary conditions model is -0.158944. The coefficient indicated that the speed of adjustment between the short-run dynamics and the long run equilibrium in the first model is 1.6%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium annually in the mode.

The Granger causality test was carried out to test the direction of causality among the variable and the result revealed that there exists bidirectional causality between RHEX and RGDP since their probability values are less than 0.05% level of significance. This implies that health expenditure Granger cause economic growth and vice-versa. The result also shows that there exist a bidirectional relationship between REX and RGDP implying that education expenditure causes economic growth and vice-versa. As observed in the result above, there is a unidirectional relationship between REX and RHEX as causality runs from education expenditure to health expenditure; however, health expenditure does not Granger cause education expenditure.

The ordinary least square (OLS) techniques was employed to determine the relative impact of government expenditure on health and education in Nigeria and the result revealed that government expenditure health and education conform to the *apriori* expectation but are statistically not significant in explaining the changes in the dependent variable. Life expectancy rate has a negative impact on

economic growth and this does not conform to *apriori* expectation. However, literacy rate conforms to the *apriori* since it was positively signed. In order to achieve the objectives of this study, the hypothesis was brought into test using the probability values obtained in the ordinary least square result to test hypothesis one and two while using the probability result obtained from the granger causality result to test hypothesis three and four. The result revealed that;

- Government health expenditure has an insignificant impact on economic growth in Nigeria.
- Government expenditure on education has no significant impact on economic growth in the period under study.
- There is bidirectional causality between health expenditure and economic growth.
- There exists bidirectional causality between education expenditure and economic growth in Nigeria.

The R^2 in the model shows the goodness of fit indicating that government expenditure on health and education accounts for 95% changes in economic growth in Nigeria. The F-test shows that the explanatory variables used in the study were statistical insignificant in explaining the change in Economic growth. The Durbin-Watson result revealed that in the test, there is no autocorrelation in our model. Jarque-Bera test was used to test for the normality of the data. The result revealed that the error terms are normally distributed. Hence, we have a good model.

5.2 CONCLUSION

Empirical analysis from this study revealed that government expenditure on health and education has a positive relationship on economic growth in Nigeria. However, their impacts are not felt in the economy significantly. Consequently, the outcomes of the health sector proxy by live expectancy rate on Nigerians also showed insignificant effect on economic growth, while LITR showed a positive significant effect on economic growth (GDP). Conclusively, the study revealed that government expenditure on health and education are key economic drivers, hence should not be neglected.

5.3 RECOMMENDATIONS

Considering the observed nature of the effect of government expenditure on health and education (and their outcome) on economic growth in Nigeria, the following strategic policy options are proffered as follows:

i. It is also logical for the government to increase its expenditure on existing health and education infrastructure as this will foster economic growth. This policy will lead to a reduction in the deplorable state and standard of the education and health sector. This may also lead to a reduction in the capital flight due to Nigerians seeking better health and education facilities abroad, as there would be availability of improved health and education services in Nigeria.

ii. Government's expenditure on education should also be increased so as to improve the level of literacy rate in Nigeria (this is because private investment in education cannot boost literacy rate as much as public investment would because of the profit motive). This is advisable due to the significant effect that literacy rate indicated on economic growth.

iii. The federal government should also increase their annual allocation to the health sector so as to improve the overall life expectancy of Nigerians. This policy recommendation is in contrast with the result obtained from our analysis but it is necessary that in order for Nigeria to move from one level of economic growth to another, until development is attained i.e. demographic transition, it becomes necessary to have a sustained increased life expectancy leading to an increase in public confidence thus the increase in life expectancy would not cause population to increase as expected.

iv. Government financial allocations to various sectors of the economy should also be well monitored in order to prevent the transfer of public funds to private accounts of government officials i.e. corruption practices. The inappropriate/misguided contract awarding process might be one of the major causes of insignificant effect of capital expenditure of health and education in promoting economic growth in Nigeria (both in the short and long-run). Thus, the federal government should carefully monitor the contract awarding process of capital projects especially in the areas of provision of infrastructural facilities like, modern hospitals, schools and sophisticated equipment to prevent over estimation of execution cost which over the years has characterized the Nigerian economy. This may bring about significant impact of government's capital expenditure on health and education on economic growth. Hence, if all these policies are put in place, the chances of achieving the improvement in the health and education sector with the aim of achieving sustained economic growth would be met in less than no time.

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APPENDIX

Data presentation

Year	RGDP (₦ Billion)	RHEX (₦ Billion)	REX (₦ Billion)	LITR (%)	LER (%)
1981	19,748.53	0.08	0.17	89.39	3.40
1982	18,404.96	0.10	0.19	85.93	4.31
1983	16,394.39	0.08	0.16	75.76	4.53
1984	16,211.49	0.10	0.20	58.96	4.76
1985	17,170.08	0.13	0.26	46.4	5
1986	17,180.55	0.13	0.26	54.95	5.25
1987	17,730.34	0.04	0.23	50.05	5.49
1988	19,030.69	0.42	1.46	47.75	6.73
1989	19,395.96	0.58	3.01	52.49	7.49
1990	21,680.20	0.50	2.40	53.12	8.29
1991	21,757.90	0.62	1.26	48.4	9.89
1992	22,765.55	0.15	0.29	43.77	25.38
1993	22,799.69	3.02	11.50	36.58	51.13
1994	21,897.47	2.09	7.38	42.07	42.97
1995	21,881.56	3.32	9.75	37.21	49.65
1996	22,799.69	3.02	11.50	36.58	51.13
1997	23,469.34	3.89	14.85	38.42	55.38
1998	24,075.15	4.74	13.59	40.55	90.78
1999	24,251.78	16.64	43.61	38.28	104.15
2000	25,430.42	15.22	57.96	34.05	205.95
2001	26,935.32	24.52	39.88	30.04	260.17
2002	31,064.27	40.62	80.53	26.77	273.22
2003	33,346.62	33.27	64.78	28.37	300.57
2004	36,431.37	34.20	76.53	26.06	336.66
2005	38,777.01	55.66	82.80	24.97	383.82
2006	41,126.68	62.26	119.02	26.17	437.57
2007	43,837.39	81.91	150.78	20.18	491.61
2008	46,802.76	98.22	163.98	18.86	580.59
2009	50,564.26	90.20	137.12	21.12	694.1
2010	55,469.35	99.10	170.80	16.82	826.67
2011	58,180.35	231.80	335.80	15.68	1,110.72
2012	60,670.05	197.90	348.40	14.21	1,252.72
2013	63,942.85	179.99	390.42	14.17	1,549.93
2014	67,977.46	195.98	343.76	15.08	1,804.40
2015	69,780.69	257.70	325.19	14.83	2,116.35
2016	68,652.43	200.82	339.28	14.72	2,445.95
2017	69,205.69	245.19	403.96	14.72	2,590.86
2018	70,536.35	296.44	465.30	19.01	2,734.53
2019	72,094.09	388.37	593.33	19.81	2,969.32
2020	70,800.54	369.35	593.44	20.91	3,978.08

Source: (i) CBN Statistical bulletin 2020

(ii) World Bank Development Indicator (WDI-online)