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HEALTHCARE SPENDING, HUMAN CAPITAL DEVELOPMENT AND SUSTAINABLE ECONOMIC GROWTH NEXUS IN DEVELOPING COUNTRIES: EVIDENCE FROM NIGERIA

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Abstract

This study was carried out to ascertain empirically the nexus among healthcare spending, human capital development and sustainable economic growth in developing countries, the Nigeria experience. The time series data for this study spanned from 1985 through 2023. The study adopted the Cointegration analysis and the Error Correction Model to estimate consistent coefficients of the variables used in the study. The results from the Error Correction Model showed that labour force, government health expenditure and life expectancy have significant effect in the determination of economic growth in Nigeria. However, the findings revealed that educational level does not have any significant impact on economic growth in Nigeria. The coefficient of the Error Correction Model indicated that the deviations of gross domestic product from its long run equilibrium value would be reconciled. Also, in the long run, labour force, government health expenditure and life expectancy have significant impact on economic growth in Nigeria, while education level does not have any significant impact on economic growth in Nigeria. Thus, the study recommended that government should increase its budgetary allocation to the health sector of the economy so as to ensure longer life expectancy and boost economic growth in Nigeria. Also, the standard of education should be raised by investing more in education in order to ensure sustainable economic growth.

Key Words: Health care, Economic Growth, Life expectancy, Education and Labour Force.

Introduction

Nigeria has been facing serious challenges especially spending on healthcare since the COVID-19 pandemic. For individuals everywhere, health is one of the most important issues to consider given its services as the foundation for all human endeavors. However, as noted by the World Health Organization (WHO, 2001), its significance was not obvious for a number of decades. The international growth literature has only just begun to highlight the implication of health as a significant predictor of economic growth and the development of human capital (Kalemili-Ozcan, Ryder, and Weil, 2000; and Bloom, Canning and Sevilla, 2005).

Health which has been defined as a state of total, physical, mental, and social well-being, and more than just being well (WHO, 1996) continues to be the most valuable human resource that helps to accomplish economic goals. Therefore, raising people's health will not only improve their well-being, productivity, and longevity but also, through the multiplier effect, directly contribute to the decrease of poverty and the advancement of long-term economic growth. Consequently, the International Bank for Reconstruction and Development (IBRD, 2005), opines that health is regarded as a strong engine that propels economic progress.

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According to the Commission for Macroeconomics and Health (2001), the burden of diseases in some low-income countries, particularly sub-Saharan Africa, stands as a severe impediment to economic growth and therefore must be addressed frontally and centrally in a comprehensive development strategy. Suffice to say, health impacts on economic growth by reducing production loss due to workers' illness, lowers the rate of absenteeism and raises productivity level as a result of better nutrition, sanitation, clean water, basic infrastructure, and housing. All of these have proven to be more effective in improving health status than curative drugs alone. It follows that better health care can increase worker well-being and productivity, and that spending on healthcare infrastructure fosters long-term economic growth.

All nations in the globe depend heavily on their human capital for national growth. Similar to any other production setup, providing healthcare and related facilities requires a certain amount of cash as well as other crucial inputs that are not free of cost. Thus, global organizations such as the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) hosted a meeting in Alma-Ata, USSR in 1978 when the idea of primary health care was presented as being crucial to achieving the goal of using health as a catalyst for social justice and growth (Lucas, 2000).

Public health spending has been acknowledged as a real tool for boosting economic growth. This explains why governments across the globe allocate a sizeable portion of their budgets to the health industries. It is evident that policy makers have realized that, regardless of a country's inherent resources, education is a crucial tool for the long-term, sustainable development of any given society since it cuts across the social, cultural, political, and economic fundamentals of the community. As stated by (Olayiwola and Olure (2017) the abilities needed to utilize the resources in a society would be absent without the appropriate human capital, which includes health and educational capacity. Otherwise, there would be a flaw in the system or structure of that civilization.

Problem Description

In 2001, African leaders made a commitment to dedicate at least 15% of their overall budget to enhancing their various health sectors. However, in Nigeria the health sector is projected to have spent over fifty million naira on average (Federal Ministry of Health, 2005). The health budget for 2023 had the largest allocation ever, but it was unable to reach the OAU pledge (Tambe, 2022). The health sector received $1.17 trillion of the $20.5 trillion proposed budget for the fiscal year 2023 and yet, nothing to explain this enormous spending, despite the fact that the health budget rose dramatically from $278.31 billion in 2015 to $1.17 trillion in the anticipated budget for 2023. This is a pitiful state of affairs, considering that nations that are comparatively poorer than Nigeria, such as Zambia, Kenya, and Ghana, devote a lesser percentage of their budget to health care but achieve considerably greater health outcomes. Clearly showing that Nigeria's successive governments have disregarded the health of their citizens, as evidenced by the country's inadequate health care facilities, filthy conditions, lack of access to clean water, etc.

On this bases, this research poses the following important query: How does Nigeria's government's expenditure on healthcare affect the country's economic growth? More importantly, since most previous studies were conducted internationally or across countries, and most Nigerian studies were primarily micro-based; this study would close a gap in the empirical literature by investigating the national impact of public health expenditure on economic growth. Once more, this study will examine the intrinsic issues that are frequently related to time series data, specifically the issues of co-integration and non-stationarity, which have been disregarded by a large number of previous empirical studies. This study would determine the long-run equilibrium link between healthcare spending and economic growth.

Goals for the Research

The study aims to achieve the following:

i. To investigate how government spending on healthcare affects Nigeria's economic growth.
ii. To ascertain how Nigeria's labor force has affected the country's economic growth.
iii. To ascertain how life expectancy affects Nigeria's economic growth.

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Research Theory

The investigation will be guided by the following hypotheses.

i. The amount spent by the government on healthcare has no appreciable effect on Nigeria's economic expansion.
ii. The labor force has no appreciable impact on Nigeria's economic expansion.
iii. There is no discernible relationship between life expectancy and Nigeria's economic growth.

Significance of the Study

Initially, the study will give a general understanding of the connection between economic growth and health. Policy decisions regarding the optimal allocation of resources to achieve the intended outcomes would be guided by the magnitudes of this relationship and the mechanisms underlying it. Furthermore, the study's conclusions will support health ministry's at all levels in creating and carrying out action plans that will consider the needs of the underprivileged from the ground up in order to successfully address the issues brought on by the lack of appropriate facilities for medical care and related services. The report will help prospective health sector investors make informed investment decisions in addition to being of great significance for foreign donors and multilateral organizations.

Brief Review of Literature

Empirical Literature

There exists a surplus research studies on health and economic growth both in developing and developed countries. Xiaoxuan Yang (2020) carried out a panel study to empirically analyze the connection between economic growth and national health spending at various human capital levels. He discovers disparities in human capital levels which reveal a major internal impact on health spending and economic growth. The study discovers a substantial negative correlation between health spending and economic development when human capital levels are low. In the same vein, health spending influences economic growth positively but not significantly when human capital is at a medium level and the beneficial economic benefit of health spending is much increased at high levels of human capital.

Mooketsane and Phirinyane (2015) in their research on health governance in Sub-Saharan Africa, illuminated the governance issues affecting the region's health care systems. They claim that among other things, conflict, poverty, unemployment, food security, climate change, inequality, and industrialization are some of the additional difficulties facing Africa. These create conflicting pressures, and make it challenging to prioritize health. Although their findings are not unique to Nigeria, they highlight the significance of comprehending the governance dynamics around health care spending and how they affect the country's ability to develop its human capital in order to experience sustainable economic growth.

Further more Imandojemu, Ekperiware, and Babatunde (2020) employ the Augmented Dickey Fuller (ADF) and Philip Perron (PP) test to study the relationship between the development of human capital and economic growth in Nigeria. Applying the vector autoregressive (VAR) approach, their findings demonstrated a direct significant association between GDP and life expectancy, government spending on health, government expenditure on education, and fertility rate. Unpredictably, human capital had an inverse significant relationship with GDP, the report suggested that the Nigerian government create a workable structure for better investment in important deliverables for the development of human capital, particularly health and education, which are crucial for labor productivity and economic growth.

Lopez and Figueroa (2016) in their discussion of the relationship between fiscal policies and sustainable development emphasized the significance of cogent fiscal policies in fostering long-term economic progress. Their result indicates that investing in Nigeria's health care spending, would promote positive effects on sustainable growth of the economy.

Keji (2021) conducted an empirical study using vector autoregressive and Johansen approaches in order to investigate the relationship between human capital and economic growth in Nigeria. His research was

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deferred by inadequate policy effects in the major economic sectors, including health and education, which would have increased Nigeria's productivity and led to economic growth. The findings of his study showed that the calculated coefficient of human capital has a major long-term impact on Nigeria's economic expansion. As a result, the study suggested that Nigeria maintain economic growth by increasing budgetary allocations to the health and education sectors in order to improve human capital capabilities, which are essential for advancing a knowledge-based economy. The report also suggested that, in order to maintain growth over time, the government should create dedicated entities tasked with enhancing human capital's competencies at all levels of education throughout the federation.

In the same vein, Oriakhi and Ajayi-Ojo (2015) researched on the connection between rising public spending and economic development. The government's expenditures on social and community services, such health and education, economic services, defense, and internal security, are among the functional areas into which they divided public spending. The findings demonstrated a statistically significant positive correlation between the gross domestic product and the major functional government expenditures, but in the shot- run, government spending on health and education has little effect on economic growth.

In developing nations like Nigeria, spending on health care, building human capital, and achieving sustainable economic growth are essential elements of development. According to the World Health Organization (WHO), health is more than just the absence of disease; it encompasses all aspects of one's physical, mental, and social well-being. As mentioned by Strauss and Thomas (2001), Productivity would increase higher in a healthy population than in an ill one. A population that is unwell will lose numerous man-hours because ill people cannot work productively. As a result, they propose a reciprocal relationship between increased health and economic expansion. They contend that accumulation and technological advancement, health and other kinds of human and physical capital raise the GDP per capita by boosting the productivity of already-existing resources. Consequently, a portion of this higher revenue when used to invest in human capital can lead to more growth in per capita income.

In the same vein, Eigbiremolen and Anaduaka, (2014) put it succinctly that human capital is the result of investments in health and education that raise the standard of human labor. It is the process of acquiring and increasing the number of people with the knowledge, training, and experience necessary for economic growth, and includes investments in training, health, education, migration, and other areas that improve a person's output.

Eniekezimene, Wodu, and Anda-Owei (2023) also investigate the impact of human capital development on economic growth in Nigeria. Using the auto distributed lag (ARDL) model, their findings showed that government spending on health, gross fixed capital formation, primary and secondary school enrolment, and education had negligible positive effects on economic growth over the long term, while government spending on education and tertiary school enrollment had negligible negative effects. According to the report, the government should establish incremental yearly goals for health spending with the aim of reaching a consensus of 15% of all public health spending. This has the potential of long-term multiplier effect and encourages economic expansion.

Badamasi (2022) investigates the connection between Nigeria's economic expansion and the development of human capital. Utilizing variables such as government spending on health, education, and life expectancy, among others, he found that gains in human capital boosted Nigeria's economic expansion. The study suggested that while the budget for the education sector should be raised over the study period, efforts should be made to coordinate the activities in the health and educational sectors of the economy.

Ogunleye, and Osabuohien (2020) investigated how healthcare spending in Nigeria affect human development. According to their findings, spending more on healthcare greatly improves human capital, which in turn spurs economic growth.

Adelakun and Adegboye (2021) use time series data to study the contribution of government health spending to economic growth; evidence from Nigeria. They opine that gains in human capital acted as a mediating factor in the positive link they found between health spending and economic growth.

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A study on human capital development and economic sustainability in the Nigerian healthcare viewpoint was conducted by Ekeocha and Anaduaka (2022). Based on their research, they conclude that wise healthcare expenditures are essential to long-term economic expansion.

Using econometric research, Okoye and Eze (2023) evaluated the relationship between health spending and economic growth in Nigeria. They found that health spending considerably boosts economic growth by improving human capital.

Furthermore, Musa and Ibrahim (2024) in their investigation of the relationship between healthcare spending and long-term sustainable economic growth in Nigeria highlight the importance of human capital and their results show that strong investments in healthcare are necessary to promote long-term economic growth by enhancing human capital.

Literature in Theory

The more contemporary Endogenous Growth Models, which improved the Neoclassical Growth Synthesis, are used to review the theoretical literature. An examination of the connection between public spending and economic growth is also included. The neoclassical synthesis holds that an economy grows when people sacrifice their current consumption to save money for investments that will pay off later as declared by Solow (1956). The steady state rate of growth in production per worker, as suggested by Swan (1956) and dubbed "the Solow-Swam Model" is thought to be equivalent to the exogenously determined rate of technological advancement. According to this framework, the sources of long-run growth are exogenously determined, and diminishing returns to capital are prevented by returns to government spending or good governance. This is seen as being sufficiently high while the rate of growth can only be influenced by any policy intended to achieve long-term, persistent growth throughout the steady state transition.

The Solow-Swan school of thought which addresses economic growth through the transfer of money and technology from developed to developing countries, are seen from an institutional standpoint. As a result, the model supported policies aimed at raising savings rates and growing the industrial capital stock in various nations. The gap in growth rates between rich and poor countries could not be explained by the Neoclassical Growth models. It's predication on the ideas of perfect competition, exogenous technology, and decreasing returns to capital had egregious misspecification, while the baseline stock and the additions made through health and education was not recognized as human capital until recently.

The endogenous growth model postulated limitations to the components that can accumulate with the expanded concepts of health, education, and capital. From this vantage point, the model suggests that any transient modification to the economic landscape has the potential to have long-term consequences, and make fiscal policy to affect growth in the long run. Since the endogenous growth model views human capital as the most important factor in production, it follows that government policies that support the acquisition of human capital through investments in health, education, and training should be prioritized.

Methods of Research

Model Specification and Theoretical Foundation

Adapting the endogenous growth model, we construct a standard production function where economic growth is a function of capital and labor in an effort to ascertain the impact of government health expenditures and health outcomes on economic growth in Nigeria and the transmission channels. Thus:

$Y = f(K, L)$ ---------- (1)

Economic growth is dependent on both human and physical capital, according to the neoclassical Solow Growth Model. Equation (1) above then becomes:

Y = f (AK, hL) ---------- (2)

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Where K is for physical capital, L is for labor (human capital), h is for the quality of labor (human capital), Y is for output (as measured by GDP), and A is the efficiency parameter. GDP growth in the above equation is contingent upon increases in the model's variables, which include technical development (A), level of physical capital (K), quality of human labor (h), and quantity of human labor (L). In other words, economic growth will be positively impacted if any of these factors improve. In light of the theoretical framework and the Solow Growth Model of Neoclassicism, We revise the following to reflect our functional model for economic growth:

GDP =f (LBF,GHX, LEX, SSE)----------(3)

Where:
Gross Domestic Product is known as GDP.
LBF = Labour Force, which measures the amount of labor
GHX is a government health expenditure that gauges labor quality.
LEX = Life Expectancy - a measure of labor quality
SSE stands for Secondary School Enrollment, which gauges labor quality.

The functional model can be stated in econometric form for empirical study as follows:
This is the econometric expression of the functional model for empirical analysis:

$$lnGDP_t = \alpha_0 + \alpha_1 lnLBF_t + \alpha_2 lnGHX_t + \alpha_3 lnLEX_t + \alpha_4 lnSSE_t + \mu_t \text{ ----------(4)}$$

Where: $\alpha_0, \alpha_1, \alpha_2, \alpha_3 \; and \; \alpha_4$ are the long run parameter coefficients
μ_t = Error term
ln = Logarithm of the variable

The a priori signs of all the explanatory variables are expected to be positive. Symbolically, the a priori expectations are: $\alpha_0, \alpha_1, \alpha_2, \alpha_3 \; and \; \alpha_4 > 0$.
The study adopts the co-integration analysis in determining whether there is a long run relationship among the variables of interest over the period 1980- 2023. The Error Correction Model (ECM) is used to establish the short-run dynamics between gross domestic product and the explanatory variables of interest. The method of data estimation is the Ordinary Least Squares (OLS) regression technique. The theoretical foundation of error correction modeling is officially established by the Granger Representation theorem (Granger, 1981 and 1986) which states that;
If Y_t and X_t' are cointegrated, then there is a long run relationship between them. Thus, we consider the following regression model:

$$Y_t = \beta X_t' + \mu_t \text{……(5)}$$

Where: Y_t is the dependent variable; X_t' is a set of explanatory variables and μ_t is the residual.
The Error Correction Model (ECM) involves using the lagged residual to correct for deviations of actual values from the long-run equilibrium values. The residual from equation (5) is therefore given as:

$$\widehat{\mu_t} = Y_t - \beta X_t' \text{…….(6)}$$

Where: $\widehat{\mu_t}$ is integrated of order zero, i.e. I(0).
Since, Y_t and X_t' are assumed to be cointegrated, the error correction model can be specified as follows:

$$\Delta Y_t = \beta \Delta X_t' + \alpha \widehat{\mu_{t-1}} \text{…….(7)}$$

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Using the ECM symbol, equation (7) may be rewritten as:

$$\Delta Y_t = \beta \Delta X_t' + \alpha ECM(-1) \ldots\ldots\ldots\

relations (the *cointegrating rank*) and each column of β is the cointegrating vector. The elements of α are known as the adjustment parameters in the Vector Error Correction (VEC) model. Johansen's method is to estimate the Π matrix from an unrestricted VAR and to test whether we can reject the restrictions implied by the reduced rank of Π.

Once co-integration is established, equation (4) is estimated using the Least Squares technique to obtain the long run parameters of α_i $(for\ i = 0, 1, 2, \dots, 4)$. The next step is to obtain the short run dynamic parameters by estimating an Error Correction Model (ECM) associated with the long run estimates. This is specified as:

$$\Delta lnGDP_t = \partial \Delta lnLBF_t + \theta \Delta lnLBF_{t-1} + \emptyset \Delta lnGHX_t + \tau \Delta lnLEX_t + \pi \Delta lnSSE_t + \rho \Delta lnSSE_{t-1} + \sigma ecm(-1) + \varepsilon_t \dots\dots\dots\

Note: Δ denotes first difference of the variable. The null hypothesis is that there is a unit root.

After first differencing at the 5 percent significance level, all of the variables are stationary, according to the unit root test results of the variables at their differences, as indicated in Table 4.2. For they are integrated of order one, that is, I(1). The reason for this is because all of the DF-GLS test statistics exceed the critical values in absolute terms. As a result, we reject the unit root null hypothesis at the five percent confidence level.

Cointegration Test

Since the log of gross domestic product (lnGDP) and the explanatory variables have the same order of integration, we suspected a cointegration among the variables. Hence, we proceeded to employ the Johansen multivariate co-integration test. The results of the test are reported in tables (4.3) and (4.4) below.

Table 4.3: Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	T race Statistic	0.05 Critical Value	Probability**
None *	0.743341	124.8696	69.81889	0.0000
At most 1*	0.619717	79.98931	47.85613	0.0000
At most 2*	0.510374	48.08363	29.79707	0.0002
At most 3*	0.415380	24.51788	15.49471	0.0017
At most 4*	0.186308	6.803723	3.841466	0.0091

Trace test indicates 5 co-integrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Results Extract from Eviews 9.0

Table 4.4: Unrestricted Co-integration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Probability**
None *	0.743341	44.88026	33.87687	0.0017
At most 1*	0.619717	31.90568	27.58434	0.0130
At most 2*	0.510374	23.56575	21.13162	0.0223
At most 3*	0.415380	17.71416	14.26460	0.0137
At most 4*	0.186308	6.803723	3.841466	0.0091

Max-Eigen value test indicates 5 co-integrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Results Extract from Eviews 9.0

The cointegration test based on the trace test indicates that there are five (5) co-integrating equations at the 5 percent level. Similarly, the maximum Eigen value test indicates five (5) co-integrating equations at the 5 percent level. This implies that a long run relationship exists between the log of gross domestic product and the log of the explanatory variables in the model. Therefore, an Error Correction Model is required. We thus proceeded to run our model using Ordinary Least Squares (OLS) technique.

Results of The Short Run Model (Error Correction Model)

Table 4.5: Estimated Coefficients of the Short Run Dynamic Error Correction Model of Economic Growth

Dependent Variable: ΔLNGDP				
Regressor	Coefficient	Standard Error	T-Ratio	**Probability**
Δ(LNLBF)	5.37E-05	1.20E-05	4.470489	**0.0001**
Δ(LNLBF(-1))	1.096574	0.089882	12.20017	**0.0012**
Δ(LNGHX)	0.015030	0.003761	3.995841	**0.0281**
Δ(LNLEX)	1.087934	0.097848	11.11859	**0.0016**

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Δ(*LNSSE*)	4.37E-06	4.87E-06	0.897659	**0.3773**
Δ(*LNSSE(-1)*)	0.009182	0.106016	0.086612	**0.9317**
ECM(-1)	-0.313510	0.097089	-3.229107	**0.0033**
C	-37.78229	10.41078	-3.629151	**0.0012**
R-Squared 0.7821		*R-Bar-Squared 0.7417*		
DW-Statistic 1.9462		*F-Stat. = 19.380[0.000]*		

(Source: Author's computation using Eview 9.0)

Based on the findings, the collection of independent variables in the model accounts for almost 78% of the total fluctuations in the log gross domestic product (GDP). This is indicated by the R^2 value of the model, which is approximately 0.78. At the 1% significance level, the 19.38 F-statistic is greater than its critical value. This shows how important the model's goodness of fit is. The absence of an autocorrelation issue in our model is indicated by the Durbin-Watson value of roughly 1.95. At the 1 percent level, the Error Correction Model's (ECM) coefficient of adjustment is significant and negative. It will therefore appropriately take action to correct any departure of the GDP from the value of its long-run equilibrium. -0.31 is its coefficient displays a somewhat sluggish long-term equilibrium adjustment process. The predicted theoretical signs of the estimated coefficients are all positive. Statistically significant at the 1% level is the log of labor force (lnLBF). This demonstrates how variations in the variable lead to variations in economic growth. A 100% increase in the labor force therefore results in a 0.00537% rise in GDP. So, one of the main factors influencing Nigeria's economic growth is its labor force. Likewise, there is a positive and noteworthy influence on GDP from the labor force's one-period lagged value. So, a 10% increase in the labor force will, in the near term, translate into an approximately 11% increase in GDP which signifies the presence of a good relationship.

The correlation between the log of GDP and the log of government health expenditure (lnGHX) is found to be consistent with the a-priori expectation. At the 5% level, the coefficient of lnGHX is substantial. Therefore, in the near term, a 10% increase in government spending on health care will result in an increase in economic growth of roughly 0.15%. At the 5% level, the log life expectancy coefficient (lnLEX) is positive and significant. Accordingly, a nation with a longer life expectancy will be more productive, and be able to boost economic growth in the near term. The log of secondary school enrolment (lnSSE), which represents educational attainment, exhibits a positive correlation with a coefficient of 4.37E-06 at the 10% level, though, it is statistically negligible.

Likewise, the logarithmic version of the SSE's one-year lagged value (lnSSE(-1)) suggests that there is a negligible positive correlation between it and economic growth in the near term.

Results of the Long Run Model

Table 4.6: Estimated Coefficients of the Long Run Model of Economic Growth

Dependent Variable: ΔLNGDP				
Regressor	Coefficient	Standard Error	T-Ratio	**Probability**
LNLBF	0.900513	0.290863	3.096007	**0.0042**
LNGHX	0.036893	0.018749	1.967753	**0.0584**
LNLEX	1.986695	0.473121	4.199128	**0.0002**
LNSSE	-0.037449	0.109014	-0.343526	**0.7336**
C	-17.05009	4.476694	-3.808635	**0.0006**
R-Squared 0.9746		*R-Bar-Squared 0.9712*		
DW-Statistic 1.9367		*F-Stat. = 287.67[0.000]*		

(Source: Author's computation using Eview 9.0)

Approximately 97% of the systematic variations in the log of gross domestic product (lnGDP) can be attributed to the independent variables in the long run model, according to table 4.5's data, where the coefficient of determination (R^2) is approximately 0.97. According to this, the explanatory factors account for

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approximately 94% of the systematic fluctuations in the dependent variable (lnGDP), as indicated by the adjusted R^2, which has a value of roughly 0.94. At 1% significance level, the F-statistic of 287.56 is more than its critical value. This shows how significant the model's excess goodness of fit is. Our model's serial correlation issue is absent, as evidenced by the Durbin-Watson score of roughly 1.94.

The log of secondary school enrolment (lnSSE) was found to have a negative value, despite the estimated coefficients in the long run model having positive signs that match the a priori signs. At the 1% level, there is statistical significance for the log of labor force (lnLBF). The t-value for this coefficient is 3.096 and it is 0.9005. Over an extended period, an increase of 10% in the labor force will yield a 9% gain in the GDP. Therefore, we are unable to accept the null hypothesis, which holds that the labor force has no discernible influence on Nigeria's economic growth. That is, one important factor influencing Nigeria's economic growth is its labor force. The log of government health expenditures (lnGHX) and there is a positive correlation and the gross domestic product (lnGDP); this outcome satisfies the a-priori expectation. lnGDP's elasticity in relation to lnGHX is 0.034. It has a 0.06 p-value. At the 10% threshold, it is noteworthy. Therefore, a 10% increase in government health spending will eventually result in a 0.34% increase in GDP. Thus, the null hypothesis that government spending on health care has no discernible effect on economic growth in Nigeria is rejected. According to its a priori expectation, the coefficient of log life expectancy (lnLEX) is positive. With a t-value of 4.1991 and a coefficient of about 1.99, at the 1% level, it is very substantial.

Thus, over an extended period, a 10% rise in life expectancy is expected to provide a 19.9% rise in GDP. Thus, we agree with the alternative theory that life expectancy significantly influences Nigeria's economic growth. It was discovered that the coefficient of log of secondary school enrollment (lnSSE) was negative and did not fulfill its a priori sign. Additionally, at the 10% level, it is statistically negligible. This suggests that long-term economic growth in Nigeria is not much impacted by the country's educational attainment.

Policy Consequence

Our research demonstrated the long-term effects of government spending on health care, life expectancy, and labor force participation on Nigeria's economic growth. Government spending on health care will increase the population's level of health, which will raise life expectancy. This is the policy's implication. A longer life expectancy will also make a country more productive, which will accelerate economic growth. Interestingly, our research also showed that there is no discernible relationship between Nigeria's economic growth and the degree of education as measured by secondary school enrollment. This suggests a gap between Nigeria's economic growth and educational attainment.

Summary and Suggestion

This study looked at the impact of health spending between 1980 and 2023 on the Nigerian economy. A number of tests, including stationarity and co-integration tests, were carried out before the empirical model was estimated. We discovered the presence of unit roots in all the variables at levels but not at first differences after doing the Dickey-Fuller Generalized Least Squares (DF-GLS) unit roots test. In other words, they were non-stationary at initial differences, but at levels they were therefore integrated of the first order. A long-term relationship between economic growth and the explanatory variables is evident, as demonstrated by the results of the Johansen co-integration test, which shows a co-integration between the gross domestic product and the explanatory variables.

Therefore, government health spending and economic growth have an equilibrium relationship over the long term. Our research additionally shown the important influence that government spending on health care, life expectancy, and labor force participation have on Nigeria's economic growth over the long and short terms. It was surprising to learn from our research that secondary school enrollment, which measures educational attainment, has no discernible influence on Nigeria's economic growth. It is therefore advised that the government allocate more funds to the health sector of the economy in order to guarantee longer life expectancies and promote economic growth in Nigeria, based on our empirical findings. In order to guarantee

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sustainable economic growth, there is also a need to increase the standard of education through increased educational investment.

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