DOES HEALTH EXPENDITURE IMPACTS ON ECONOMIC GROWTH IN NIGERIA?

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ABSTRACT
A nation with healthy people is considered a wealthy nation. This study is designed to evaluate the impact of health expenditure on education attainment and economic growth in Nigeria. Most empirical studies in literature pay little or no attention to this area but majorly focus on how people achieve better health when there is economic growth. This could be as a result of the general consensus that economic growth leads to improved health status while the attention was not given to whether causality exists in the reverse direction. This study is carried out to breach this gap. Autoregressive conditional Heteroskedasticity regression analysis was employed and the result shows that health expenditures and education attainment are important determinants of economic growth in Nigeria while life expectancy rate has negative impact on growth for the period covered by the study. As a result, the following policy measures are suggested among others that government should encourage education attainment through improve education spending in the economy, increase expenditures on health provisions, induce the level of education attainment and place priority on improve health spending to enhance economic growth.

1.0 Introduction

The economic development of Nigeria had been poor particularly if the enormous revenues generated from oil are to be considered. Nigeria enjoys huge revenues from their oil sector being the largest producer of oil in Africa and being among top 10 producers of oil in the world (Ranjan & Sharma, 2008), but most of its revenues have been served to the ruling elites to fill their treasure chests rather than being used to fuel the development of people and their quality of lives. As per the estimates of World Bank less than 1% people of Nigeria benefit from 80% of the revenues from oil Library of Congress, (2018). Such statistics are equally shocking as well as disheartening and point out towards the problem of corruption in Nigeria.

The government expenditure in Nigeria has shown a continuously rising trend due to excessive receipts from production and selling of crude oil along with the rising demand for public goods (utilities) like communication, education, power, health and roads. Other than that, the need to provide both external and internal security for the nation is constantly rising. Statistics show that the overall capital and recurrent expenditure of government as well as its components have showed a constant rising

trend for the past three decades which unfortunately has not been able to translate into meaningful development and growth as Nigeria continues to be counted among the poorest countries of the world Olugbenga, & Owoye, (2017). He further states that many people in Nigeria are still living below the poverty line. This statement in turn supports the claim made by the data set presented by the library of congress. The dilemma does not end here, rather increases when the crumbling infrastructure, especially the power supply and roads are mentioned because the run-down framework led to the collapse of a lot of industries which in turn resulted in high unemployment. Furthermore, the macroeconomic indicators such as import obligations, exchange rate, balance of payments, national savings and inflation reveal that the country has not been able to fare well in the past (Cooray, 2019).

WHO (2016) reveals that about 50% of the differential of economic growth between the developing and developed nations can be attributed to poor health and little life expectancy. In developed countries a greater portion of their GDP is spent on health care for they believe that the health of the residents would eventually be a major driver for development and economic activities. Studies have been conducted by a lot of researchers Kaufmann, Daniel, AartKraay and Pablo Zoido-Lobaton. 2019; McCarthy & Wolf (2016) along with a lot of others, there have been frantic efforts by the governments in Nigeria also to increase the expenditure on public health. The above-mentioned scenario makes it evident that the expenditure on health care by the government in Nigeria had continuously been increasing claims by Abu (2015) the following facts should be considered. The infant mortality rate of Nigeria is one of the highest in the world (91/1000 live births). Secondly the rate of mortality for children below the age of five is 192 deaths/1000. Furthermore, the coverage of immunization has fallen below 30%. The figures from the year 2017 state that around 134,000 (which is a huge figure) women lost their lives to pregnancy complications. Not only that, but also the expectancy ratio has been observed to be declining over the years WHO, 2018; Yaqub, Ojapinwa &Yussuff, (2019). A point to be noted here is that in spite of all the economic development and increase in public expenditure on health, the health conditions of people stay poor and the contribution of all the economic growth seems to be marginally low. Nigeria enjoys huge revenue from the oil sector being the largest producer of oil in African and being among the top 10 producers of oil in the world (UNDP 2019).

As per the estimate of World Bank less than 1% population of Nigerians benefit from 80% of the revenue from oil Library of Congress, (2018). Such statistics are really shocking as well as disheartening and point out towards the problem of corruption in Nigeria. Another major challenge associated statistics are really shocking as well as disheartening and point out towards the problem of corruption in Nigeria. Another major challenge associated the activities of Boko Haram, banditry and kidnapping which have all contributed their fair share. Owing to this issue of civil unrest, strikes in the educational and health system is a serious damage as the number of out of school children has increased by 13.2 million, making it the largest in the world UNDP (2019), in line with the World bank (2020) estimates.

It should however be noted that despite the increase in government expenditure on health provisions in Nigeria, the contribution of this to human health is still marginally low. Moreover, the extent and magnitude of its impact on education attainment and economic growth is yet to be adequately investigated probably because of the general unidirectional impression that economic growth facilitates better health. Off course, for example, economic growth could lead to increased availability of food for better healthy living; increased earning which makes health spending more affordable; and also raises demand for good health services and education. Higher economic growth could also imply higher public revenue which can translate into higher investment in health infrastructure and education. Therefore, there is a question of whether causality exists in the reverse direction? In other words, does improved health lead to economic growth? And does health expenditure impact on education attainment? If yes, then to what extent and in what magnitude does health contribute to economic growth and education attainment especially when one accounts for other potential factors that are empirically known to drive growth? It is therefore likely that causality exists in both directions. However, the question of which direction dominates could be an area of interest for further studies. Therefore, this study seeks to evaluate the economic growth impact of health expenditure, the relationship between health expenditure and education attainment, to determine the extent

and magnitude of its contributions to the Nigerian economy, from 2000 to 2022.

2.0 Literature Review

2.1 Conceptual Issues

Human capital connotes the skills, knowledge and capacities of people related to their actual or potential participation in the labour force (Imahe, 2001). Human capital is the pivotal source of growth in several endogenous growth models, as well as one of the key extensions of the neoclassical growth models (Oyeyemi, 2014).

Oluwatoyin (2011) cited Jhingan (2005) asserted that in a broader sense, human capital means expenditure on health education and social services in general, and in its narrower sense, it implies expenditure on education and training. Health and education are two closely related human (resource) capital components that work together to make the individual more productive. These are the two integral parts of human capital that strongly influenced labour productivity Campbell and Agbiokoro, (2014). Health is central to well-being and education is essential for a satisfying and rewarding life: both are fundamental to the broader notion of expand-ing human capability and that it has the heart of the meaning of development Todaro, (2009). A healthy populace will be highly productive and the educated have the tendency to apply a degree of sophistication in the production process. One component cannot be considered important than the other (Lawanson, 2009).

Health is one of the major components of Human capital development and the basis for individual's productivity. Human capital as an economic term encompasses health, education and other human capacities that can raise productivity Todaro & Smith, (2011). Health connotes the ability to lead a socially and economically productive life Anyawu (1997). Mayer-Foulkes (2001) observed that health is responsible for approximately one- third of long-term eco-nomic growth. Lustig (2006) considered health to be an asset with an intrinsic value as well as an instrumental value. According to Imahe (2018), investment in health is a life resource because in-vestment in health is for the living and not the dead. This resonate the raison d'etre for government encouragement of both the private and public investment in the sectors. Private sector participation includes medical licensed non-governmental organization, private for-profit providers, community-based organization and religious and traditional care givers while the government assumes the responsibility of health service provision in the public sector. Nonetheless, the devoted private and public fund for health care provision in Nigeria remains abysmal hampering concerted effort to-wards improving the health status of the citizenry so that they can contribute meaningfully to eco-nomic growth and development. The expenditure pattern on health depicts the low amount spent on health in Nigeria with attendant concomitant deplorable health statistics. It was estimated that by year 2007, more than one hundred and thirty-four thousand women died from pregnancy complications. In addition, the life expectancy ratio on the average has been on the decline over the study period. Life expectancy is put at 52 years in 2011(according to World Bank) and crude death rate, in that same year as 14% Onisanwa, (2014). The figure is a clear indication of the nation poor commitment to improved health provisions and deliveries. Nigerian overall health system performance ranked 187th among the 191 Member States rated by the World Health Organisation (2000) and National Health Policy, (2004). The Nigeria's rate of infant mortality (91 per 000 live births) is among the highest in the world.

Nigeria being a very large country is the 8th largest country in the world, population wise and 32nd largest according to area Orenstein, (2012). The gross domestic product (GDP) per person in Nigeria was $ 2000 in 2008. Even after such a figure of GDP which is above average per capita GDP for an African nation; developing one, majority of the Nigerian population is living below the poverty line and suffer from excessive poverty. The rank that Nigeria holds on the human poverty index of United Nations is 158th. There exists an enormous income gap in Nigeria the proof of which is the fact that 50% population of Nigeria are living below $1 per day (UNDP, 2019).

The economic development of Nigeria had been poor particularly if the enormous revenues generated from oil are to be considered. Nigeria enjoys huge revenues from their oil sector being the largest producer of oil in Africa and being among top 10 producers of oil in the world (Ranjan & Sharma, 2008), but most of its revenues have been served to the ruling elites to fill their treasure chests rather than being used to fuel the development of people and their

quality of lives. As per the estimates of World Bank less than 1% people of Nigeria benefit from 80% of the revenues from oil (Library of Congress, 2018). Such statistics are equally shocking as well as disheartening and point out towards the problem of corruption in Nigeria (Igbeng, Beredugo & Adu, 2015).

The government expenditure in Nigeria has shown a continuously rising trend due to excessive receipts from production and selling of crude oil along with the rising demand for public goods (utilities) like communication, education, power, health and roads. Other than that, the need to provide both external and internal security for the nation is constantly rising. Statistics show that the overall capital and recurrent expenditure of government as well as its components have showed a constant rising trend for the past three decades which unfortunately has not been able to translate into meaningful development and growth as Nigeria continues to be counted among the poorest countries of the world Olugbenga, and Owoye, (2017). He further states that many people in Nigeria are still living below the poverty line. This statement in turn supports the claim made by the data set presented by the library of congress. The dilemma does not end here, rather increases when the crumbling infrastructure, especially the power supply and roads are mentioned because the run-down framework led to the collapse of a lot of industries which in turn resulted in high unemployment. Furthermore, the macroeconomic indicators such as import obligations, exchange rate, balance of payments, national savings and inflation reveal that the country has not been able to fare well in the past (Cooray, 2019)

2.2 Impact of Economic growth on Health

One of the primary needs of human beings is good health care. Bakare, and Olubokun, (2011) have concluded that generally health of people improves when economic growth takes place while infant mortality rate lowers and life expectancy increases. Fahey, Russell, and Whelan. (2018) state that people don't necessarily feel healthy if life expectancy is increased. Improvements in terminologies of science and medical attribute to better treatment and management of ailments like diabetes, but a person who has a chronic condition may not label himself as healthy even in periods of economic growth and proper provision of health and medical facilities. Taking into account the afore mentioned fact it could be said that the relationship between economic growth and healthy being of people is rather a complex one and it is much more than just factors of economic growth affecting the health of people.

2.3 Impact of Economic Growth on Education

Various studies have been carried out to study the relationship between economic growth and education. Many of them had been cross country analysis. The methods adopted in the work already done are three stages least squares (Barro 2019). Ordinary least squares (Geol, 2014; Barro, 2019, Barro and Lee 2017; Abbas 2011; Lin, 2013), granger causality (Self and Grabowski 2016) and co-integration (Babatunde and Adefabi, 2015). These studies have produced mixed results but the nature of relationship determined by all of them had been positive (the relation between economic growth and education) produced mixed results but the nature of relationship determined by all of them had been positive (the relation between economic growth and education). Earlier studies however (Lucas 2018; Romer 2019) had made analysis of importance of human capital development and education in the process of growth, Barro (2019) was the first one to shed light on the link between economic growth and educational expenditures. He found out that the relationship between per capita output and human capital was positive and that it leads to increased enrolment in schools. He recommended that the gap between developing and developed countries could be closed if countries started investing more in human capital development.

Ramirez, Ranis and Stewart, (2017) made use of cross-country data to investigate the channels through which economic growth effects human capital development and vice versa. The basic argument presented in this study was that educational development is not directly related to economic development rather there's a channel in between which is the human capital development. And human capital development may cause economic growth or it could be the other way round too. Loening (2015) analyzed the relationship between economic growth and human capital development employing data from Guatemala and concluded that an educated work force impacts growth output positively. Dorian (2017) using a neoclassical framework approximated a structural growth model in which he used two explanatory variables; health and education. Positive relationship between health and economic growth was found whereas there was no

evidence of a significant relationship between economic growth and education.

2.4 Empirical Review

Onwuka (2021) empirically examined the relationship between poverty, income inequality and economic growth in Nigeria. The study used time series data from National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) Statistical Bulletin between the periods from 1981 to 2019. The study employed the use of Augmented Dickey Fuller test, Co integration test and Error Correction technique. The unit root test results indicated that all the variables were stationary at first difference and co-integration test confirmed a long run relationship among the variables. The error correction model shows that about 96 percent of the discrepancy between the actual and the equilibrium value of economic growth is corrected or eliminated each year. The coefficient of determination (R2) is 0.68 which shows that about 68 percent variations in the economic growth were explained by the independent variables. Similarly, the findings also revealed that poverty and income inequality has an insignificant effect on economic growth in Nigeria.

Keghter, Eze and Ogbonna (2020) state that, Institutional quality is considered to be a determining factor in enhancing the growth of any economy. This paper examines the role of institutional quality in growth enhancement and the precise role it plays through the channel of health expenditure. The ARDL model was employed between the period of 1984 and 2019 to ascertain the link between the variables in question. The paper provides evidence that the long-run effects of health expenditure and institutional quality on economic growth are both surprisingly negative, but with only institutional quality having a statistically significant relationship. Further findings reveal that the institutional quality moderates the effect of health expenditure on growth. Specifically, when institutional quality is maintained at a threshold of 0.52 level, growth will be at least positive. This means that, with institutional quality at less than the threshold level, the economic growth will become negative. However, with the right policies in place as recommended, there could be a turn in events.

Idowu (2019) in his paper examines the impacts of health on Economic growth in Nigeria. The cointegration and granger causality techniques were used in analysing Quarterly time series data of Nigeria for the period of 1995-2009. The study finds that GDP is positively influenced by health indicators in the long run and health indicators cause the per capita GDP. It reveals that health indicators have a long run impact on economic growth. Thus, the impact of health is a long run phenomenon. Ordinary least squares method had been used by Omotor (2019) to analyze the determinants of federal government expenditures in the field of education in Nigeria. Instability in government expenditure was predicted through that study because the study revealed inconsistency in expenditure of government in the education sector in Nigeria. The only significant determinant of education expenditures was found to be government revenue.

Easterling and Angelicum (2018) in their article titled: to what extent are improvements in quality of life (material living levels, health, education, political and civil rights, happiness, and the like) associated with economic growth? International comparisons of quality of life (QoL) conditions almost always point to a strong positive association with real GDP per capita. Historical experience, however, frequently belies the results of these comparisons. More often than not the timing of various improvements in QoL, material living levels excepted, is different from that in real GDP per capita - some indicators preceding, others following. Moreover, the sequence of improvements in various aspects of QoL is not always the same from one part of the world to another. And sometimes, as in the case of happiness and life satisfaction, QoL indicators remain unchanged despite a doubling or more of real GDP per capita. In contrast to the results of simple international point-of-time comparisons, history suggests that improvements in many realms of life are not an automatic result of economic growth.

Babatunde and Adefabi (2015) carried out an in-depth analysis about the relationship between economic growth and education in the long run in Nigeria and the approach employed was the Johansen co- integration framework of analysis. The co integrating technique predicted a long-run relationship between output per worker and school enrolments in all years of education (primary as well as tertiary). The conclusions presented by the study stated that

growth is affected positively through evolution of total factor productivity as well as factor accumulation if the labour force is well educated. Aighokhan (2018) examined the impact of expenditures (education) on human capital development. Historical data was used in the study to formulate correlation between human capital and education expenditure in Nigeria and acclaimed that uncertain and insufficient allocations of budget resulted in destruction of its effect on human capital development. Low percentages of annual budgets were allocated to be spent on education and they were unstable also.

2.5 Gap in Literature and Value Addition

An appraisal of reviewed literature showed a notable gap in knowledge when it comes to the impact of health expenditure on growth in Nigeria. The majority of studies (such as Onwuka 2021; Keghter, Eze & Ogbonna 2020; Idowu, 2019; and Aighokhan 2018) have investigated the impact of health expenditure on economic growth without extending the study to 2022 on health expenditure-growth relationship. Thus, this study seeks to fill in the knowledge gap by expenditure-growth relationship. By Examining the interactive effect of health expenditure and economic growth and subsequently the threshold level could help policymaker in designing policies that improves economic growth above the threshold.

3.0 Theoretical Framework

The standard Cobb- Douglas production function provides the methodological framework of factors that foster economic growth Carone (2006). The production function relates labour input, capital input and technological progress, i.e., the residual which cannot be explained by the quantity and quality of either labour or capital. The factors that impact output could be captured in an aggregate production framework (APF). From the study of Oderinde & Ishola (2011), the standard aggregate production function assumes that along with other "conventional inputs" of capital and labour used in the neoclassical production function, "unconventional inputs" factors fostering economic growth may be included in the model to capture their contribution to economic growth. In line with Bleischwitz (2001), the standard concepts to measure multi- factor productivity assume an aggregated Cobb-Douglas production function with labour, capital and technical progress as the factor being measured. Additionally, the other production functions like the CES (constant elasticity of substitution) or the translog production function are used to measure economic growth. The production function is stated as:

3.1 Model Specification

We shall use the AK model in its special case of a Cobb–Douglas production function because of its simplicity in analyzing the possible relationship among health expenditure, institutional quality and economic growth. The model is specified as;

$$Y = A K^{a} L^{\Phi} \quad \text{----------(1)}$$

Where Y = gross domestic product; A = total expenditure on health; K = capital; L = labour force participation and the parameter measures the output elasticity of capital. Theoretically, the effect of health expenditure (HE) on economic growth will operate through labour force participation. We assume therefore that labour force participation is a function of HE Thus:

$$A = f(HE, LE, IMR, LFP) = HE^{\beta 1}, LE^{\beta 2}, IMR^{\beta 3}, LFP^{\beta 4} \quad \text{----------(2)}$$

Substituting equation (2) into (1) give

$$Y = HE^{\beta 1}, LE^{\beta 2}, IMR^{\beta 3}, LFP,^{\beta 3} K^{a} L^{\Phi} \quad \text{----------(3)}$$

Where β_1, β_2 β_3 β_4 a, ϕ are constant elasticity coefficients of production with respect to HE, LE, IMR, LFP, K, and L after the usual logarithmic transformation.

3.2 Model Specification

Following equation (3), the basic estimable equa HE tion is specified as:

$$LRGDP = \phi + \beta_1 LHE_t, + \beta_2 LE_t + \beta_3 IMR_t + \beta_4 LFP_t + \beta_5 \lambda + \varepsilon \quad \text{----------(4)}$$

Where; LRGDP = log of real gross domestic product (proxy for economic growth), LHE = log of health expenditure, LE = life expectance, LFP = labour force participation, λ = population growth We will now model our equation to capture the interactive term that would ascertain the impact of health expenditure on education and economic growth.

$$LRGDP = \phi + \beta_1 LHE_t, + \beta_2 LE_t + \beta_3 IMR_t + \beta_4 LFP_t + \beta_5 (LHE * LE * IMR * LFP)\, \beta_6 \lambda + RGDP_{t-1} + \varepsilon \quad \text{--(5)}$$

By considering the possible signs of the coefficients in equation (5). If $\beta_1 > 0$ and $\beta_4 < 0$, it explains that health expenditure has a positive impact to RGDP and education attainment that negative impact; but with $\beta_1 > 0$ and $\beta_4 < 0$, it simply means that health expenditure is a setback to economic growth while education attainment tries to redeem the economic growth with its positive sign. In a case where both β_1, β_2, β_3 and β_4 are negative, it means that with a higher level of health expenditure, the economy will be cursed and education attainment will intensify that curse; but if the two parameters turn out to have positive signs, an increase in health expenditure will be a boost and education attainment will further heighten the enhancement in Nigeria.

To estimate equation (5), the study adopts the Autoregressive conditional Heteroskedasticity (ARCH) framework by Pesaran and Shin (1999) and further developed by Pesaran et al (2001). ARCH bounds test approach appears to have gained prominence recently for some of reasons. First is the problem of endogeneity and the inability to test hypotheses in the long run with limited coefficients connected to the Engle-Granger method are avoided, that is, it has superior statistical properties on small samples as it is relatively better measure in the case of small samples, while the Johansen co-integration techniques still require large data samples for the purpose of validity. Second, the long run and short run parameters of the model are estimated simultaneously. Lastly, whereas all the other methods require that the variables in a time series regression are integrated of same order, only that of Pesaran et al. (2001) could be used regardless of whether the underlying variables are either I(0), I(1), mixture of I(0) and I(1) or fractionally integrated. But it is important to ensure that the variables under consideration are not integrated at an order higher than one.

4.0 Results and Discussion of Findings

Table 4.1: Descriptive Statistics of the variables

variables	mean	Max.	Min.	Std. Dev.	Skewness	kurtosis	Jarque-Bera	Prob.	Observ.
GDP	2.426602	12.27614	-4.162059	3.504958	0.409580	4.376934	2.460013	0.292291	23
HE	3.564342	5.053610	2.490640	0.580649	0.904708	3.649733	3.542135	0.170151	23
IMR	86.08116	109.6000	70.60000	11.54649	0.576420	2.227321	1.845821	0.397361	23
LE	50.75141	52.91000	47.19300	1.813696	-0.557576	2.054311	2.048813	0.359010	23
LFP	33.36145	64.17000	24.84000	7.545587	3.014962	13.36729	137.8472	0.000000	23

Source: *Authors' Computation using Eviews 11*

Table 1 show the descriptive statistics of the variables for the study for the study. The growth rates of gross domestic product per capital lie between 12.27614 and -4.162059. The standard deviation was 3.504958 and the average growth rate was 2.426602 from 2000 to 2022. The coefficient of Skewness, kurtosis and Jarque-Bera statistic with a probability of 0.292291 indicated that the variable followed a normal distribution. All the independent variables

followed a normal distribution pattern except labour force participation with probabilities of 0.000000. Majority of the variables considered for this study are normally distributed based on the coefficient of skewness, kurtosis and Jarque-Bera statistics probability values which are more than 5%.

4.2 Unit Root Tests

Table 4.2: Summary of Unit Root Tests

Variable	ADF				Phillips- Perron				Remark
	coeff.	t.Stat	Prob. level.	Prob. 1st differ.	coeff.	t.Stat	Prob. level.	Prob. 1st differ.	
GDP(-1)	0.4644	-2.443	0.1424	-	-0.4644	-2.3583	0.1641		1(0)
D(DGP(-1)	-1.7581	-5.8887	-	*0.0000	-1.3891	-6.5849	-	*0.0000	1(1)*
HE(-1)	-0.5702	-2.8196	0.717	-	-0.5702	-2.8198	0.0106	-	1(0)
D(HE(-1)	-1.3239	-6.099		0.0001	-1.3239	-6.0999	-	*0.0000	1(1)*
IMR(-1)	-0.1814	-4.7653	0.0005	-	-0.0735	-5.8018	*0,0000	-	1(0)*
D(IMR(-1)	-0.0465	-0.2082	-	0.8373	-0.0465	-0.2082	-	0.8373	1(1)
LE(-1)	-0.0695	-4.1983	*0.0004	-	-.0.0695	-4.1983	0.0004	-	1(0)*
D(LE(-1)	-0.5879	-2.8585	-	0.0101	-0.5879	-2.8585	-	0.0101	1(1)
LFP(-1)	-1.0244	-2.0939	0.0492	-	-1.0244	-2.0939	0.0492	-	1(0)
D(LFP(-1)	-1.7004	-3.0557	-	*0.0005	-1.7004	-3.0557	-	0.0065	1(1)*

Source: Authors'Computation using Eviews 11

Table 2 presents the unit root tests. The variable considered for the study were not integrated in the same order. The two-unit root tests (ADF and PP) employed showed that two variables (infant mortality rate (IMR) and life expectances (LE)) were stationary at level. While the other three variables (gross domestic product per capital growth rate (GDP), Health expenditure and Labour force participation (LFP)) were not stationary at level, but they became stationary after the first difference. Following the difference in the order of

integration found in the variables, it appeared unnecessary to proceed with the traditional cointegration tests and cointegration estimations (Eagle and Granger,1987; Maddala and Kim, 1998; Stock and Watson, 1993). By the features of the variables and our sample size, the ARCH- Autoregressive conditional Heteroskedasticity approach appeared more appropriate.

Table 3: ARCH- Autoregressive conditional Heteroskedasticity

Dependent Variable: GDP				
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)				
Date: 12/29/23 Time: 22:19				
Sample: 2000 2022				
Included observations: 23				
Failure to improve likelihood (non-zero gradients) after 36 iterations				
Coefficient covariance computed using outer product of gradients				
Presample variance: backcast (parameter = 0.7)				
GARCH = C(6) + C(7)*RESID(-1)^2 + C(8)*GARCH(-1)				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
HE	-1.144052	0.894665	-1.278750	0.2010
IMR	-0.634611	0.085742	-7.401406	0.0000
LE	-5.539774	0.617595	-8.969921	0.0000
LFP	0.024319	0.093556	0.259937	0.7949
C	341.7684	37.45330	9.125188	0.0000
	Variance Equation			
C	0.954526	0.052707	18.11005	0.0000
RESID(-1)^2	-0.237404	0.066243	-3.583825	0.0003
GARCH(-1)	0.986244	0.118674	8.310551	0.0000
R-squared	0.812418	Mean dependent var		2.426602

Adjusted R-squared	0.704067	S.D. dependent var	3.504958
S.E. of regression	2.705712	Akaike info criterion	4.702327
Sum squared resid	131.7758	Schwarz criterion	5.097281
Log likelihood	-46.07676	Hannan-Quinn criter.	4.801657
Durbin-Watson stat	2.322926		
Prob(F-statistic)	0.000001		

From the table Autoregressive conditional Heteroskedasticity model estimation result presented in table 3, the value of the coefficient of determination (R-Squared) is 0.8124, indicating that 81% of the systematic variation in gross domestic product per capital growth rate is captured by the explanatory variables included in our model. The remaining 19 % is accounted for by other variables not included in the model. The F-statistic with a probability value of 0.000001 indicates that a significant relationship exists between GDP and the explanatory variable included in the model. The value of in the Durbin Watson (DW) statistic of 2.322926 suggests that there are no effects of autocorrelation in our estimated model. This makes our result reliable for policy decision –making.

The individual effect of the explanatory variables on the dependent variable is determined based on the coefficient and p-value of the variable. The results show that infant mortality rate is statistically significant at the 5% level. This is based on its probability vale estimated at 0.0000. the coefficient of IMR is -0.634 unit decrease in GDP. This result is in agreement with the findings of Ashhakah and Ogbebor, 2020 and Ikhide, 2021. The results also show that life expectance (LE) is significant at the 5% level. This is based on its probability value of 0.0000. The coefficient of LE is -5.539. it shows that a one unit decrease in LE will lead to about 5.5 unit decrease in GDP.

This result is also in corroboration with Oluseun and Kazeem (2017) who also reported this negative relationship in the short run. Further studies by Adedotun and Oluwatosin (2018) also found control of corruption to exert a negative impact to economic growth, thereby contradicting the apriori expectation.

The interactive term (LE) from our analysis suggests that with increase health expenditure and the quality of the institutions/expenditures (i.e. there are no leakages and allocated funds are channeled appropriately and effectively considering the economic cost and benefits of government investments) then the health expenditures would bring more economic prosperity. This report is similar to the findings of Rizvi (2019) who proxied education by government enrolment in high school and also reported a positive interactive effect between health expenditure and education.

5.0 Summary of the Findings, Conclusion and Recommendation

5.1 Summary of the findings

The study examined the impacts health expenditure on education attainment and economic growth in Nigeria using ARCH technique of analysis. The study focused on Nigeria experience spanning from 1990 – 2022. The findings revealed that health expenditures and education attainment are important determinants of economic growth in Nigeria.

5.2 Conclusion

It is established by this study that health expenditures and education attainment are

important determinants of economic growth in Nigeria while life expectancy rate is the only variable that exerts negative impact on growth for the period covered by the study. The regression results reveal that health expenditures is characterised by the highest positive value of coefficient followed labour force participation. It should therefore, be noted that, health expenditure has a vital relationship with economic growth of any nation. It is capable of improving the health, the life expectancy, the efficiency, productivity and income of labour as well as the level of education attainment in the economy.

5.3 Recommendation

Social spending especially on health is vital for a country's economic growth. However, there should be an institutional reform that encourage transparency and monitoring and evaluation of health expenditure will no doubt lead to economic growth.

The above findings have important policy implications. Firstly, since health expenditure and labour force participation enhance the level of economic growth, hence, government should encourage budgetary improvement in education sector in the economy, increase expenditures on health provisions and induce the level of labour labour force participation. Meanwhile, life expectancy does not impact positively on economic growth, therefore, government should be more sensitive to the issue of insecurity to lives and properties (Oni, L. B., 2012) ensure the adequate provisions of health and medical facilities, promote the welfare of health and medical workers and create job opportunities, thus, this will spur economic growth in Nigeria.

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