GOVERNMENT HEALTH EXPENDITURE AND EDUCATIONAL OUTCOME IN NIGERIA: INTERROGATING THE NEXUS

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Abstract

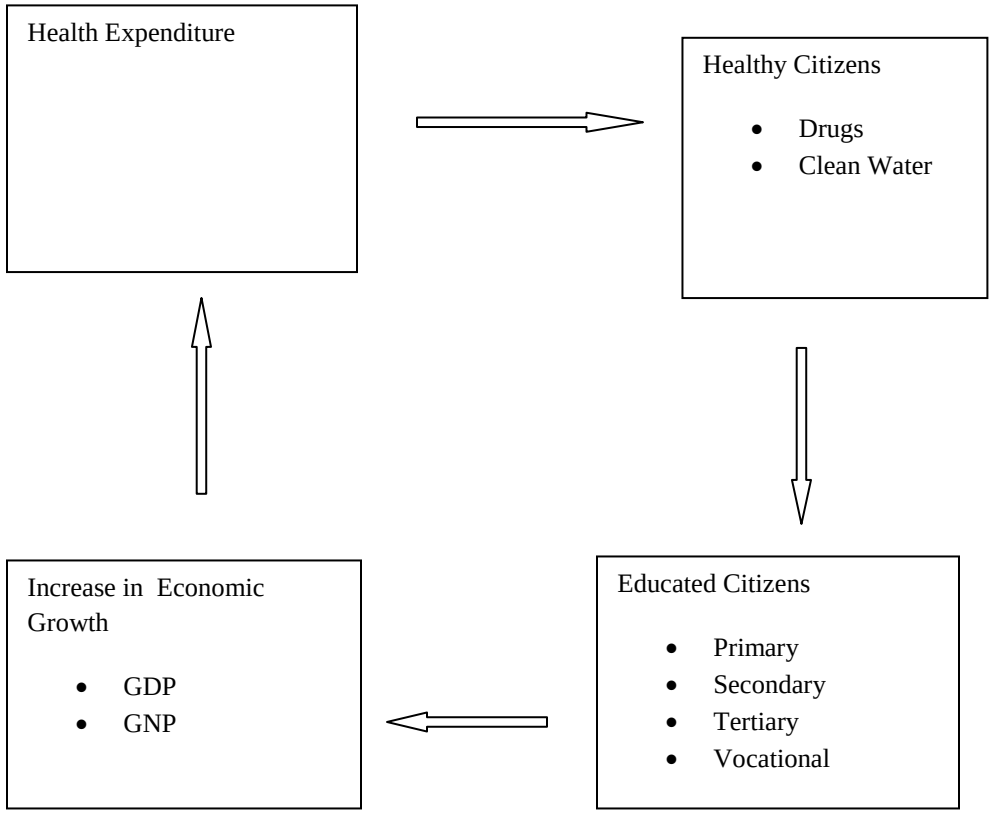
The study examined the nexus between government health expenditure and educational outcome in Nigeria from 1981 to 2021. To achieve this objective the study collected time series data on the relevant variables namely: government health expenditure, school enrolment ratio which was used as the proxy for educational outcome, infant mortality which chosen because it received the direct effect of a change in government health expenditure and the Gross Domestic Product of Nigeria. The study conducted a stationarity test using the Augmented Dickey Fuller Unit Root test and a long run relationship was tested with the aid of the Johansen test for integration. The study found all the variables to be stationary at first difference while thevariables were conitegrated at 5% level of significance. The Vector Autoregressive Model (VAR) was used to examine the interconnectedness of the variables and their relationships.It was however discovered that health expenditure in Nigeria had a positiveimpact on educational outcome.The findings of the paper revealed that government health expenditure can have positive impacts on school enrolment ratioin Nigeria depending on how significant the amount spent on the health sector is. This implies that as health expenditure rises, school enrolment ratio rises. The study recommended among other things that a significant portion of the Nigeria's budget should be allocated to the health sector to generate a positive change in the educational sector.

Keywords: Health expenditure, school enrolment ratio, and human, development, and index

Introduction

When government increases expenditure, it has a multiplier effect which is expected to improve economic activities regardless of the type of expenditure the government decides to increase. And the extent to which it is increased. For instance, when government increases the health expenditure of a nation, sectors such as the health, educationand agriculture among others will receive an impact all things being equal. This impact could be significant or insignificant depending on how significant the expenditure is. The impact is directly felt in the health sector and indirectly felt in the educational and agricultural sectors through the increase in the enrollment of pupils and students, and through the healthy manpower needed to work at farms and agro-based companies.

Education is a very sensitive sector in every economy because it increases the human capital of a nation. A nation faced with a poor human capital may have issues with economic growth since the skills of labour are needed to drive economic activity hence the need to impact knowledge and skills into the population. However, only that fraction of the population that enrolls in schools have access to the needed form of training which enhances their abilities. A link has been said to exist between government health expenditure and educational outcome in Nigeria (see, Umar, Rotimi and John 2022).

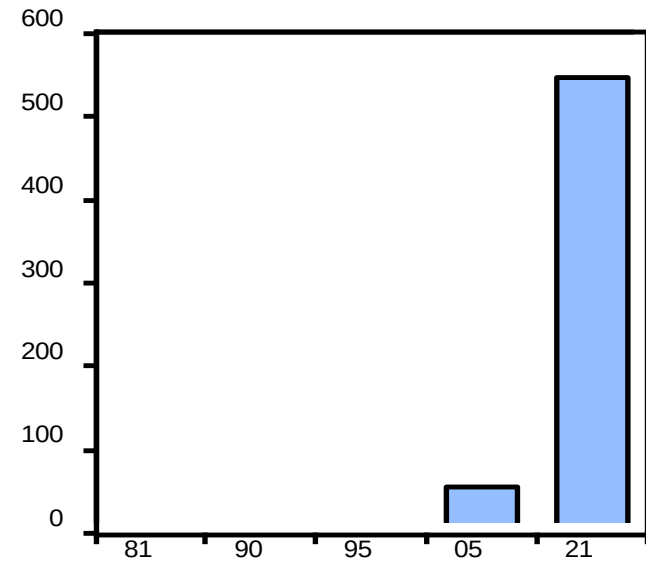


Source: Umar *et al*, 2022

Figure 1: Circular flow of Resources

An increase in government health expenditure raises health outcome which translates into healthy citizens who give back to the nation through their contributions to Gross Domestic Product (GDP). A rise in GDP improves the condition of a nation and raises its potential to increase health expenditure again and the circle continues.Only healthy citizens can enroll in schools graduate and become better citizens who can give back to the Nation in the future.When government increases or decreases expenditure in health, it directly affects health outcomes through the increase or decrease in certain variables like infant mortality, life expectancy, under five mortality among others (Oladosu, & Anaduaka, 2022;Azuh, Osabohien, Orbih, & Godwin; 2020 and Umar et al, 2022). Also the multiplier effect of this change in government health expenditure would be felt on the educational outcomes all things being equal. Educational outcomes such as School enrollment ratio may rise or fall depending on the direction of health expenditure. Therefore, when government fails to increase health expenditure, health outcomes and educational outcomes will be affected negatively and growth will dwindle consequently.

Developed nations recognizes the importance of allocating huge sums of their Gross Domestic Product on health because, they have over time discovered that through an improved health sector, educational outcome can be improved (Aigbedion, 2021). Aigbedion (2021)further opined that, for a nation to gather adequate and efficient human resource, citizens must be healthy and educated. The recognition of this fact led to a meeting of African Union leaders in April 2001 where the conclusion reached was to increase the health expenditure of their countries to 15% of their yearly budgets (Aigbedion, 2021). In adherence to the conclusion reached, the government of Nigeria has been increasing her expenditure on health as reported by Central Bank of Nigeria's statistical bulletin (2020). The bulletin revealed that the expenditure on the health has had an upward trend since 1981. The government allocated the sum of 0.1 billion naira to the health in 1981, 0.5 billionaire in 1990 3.3 billion in 1995 and 55.22 in 2005.On continuous basis, it reached 547.00 in 2021 (CBN, 2021). Consider figure 2



Source: eviews

Figure 2: Graph of Government health expenditure

Despite the increase in government health expenditure, studies have shown that education outcome in Nigeria has not been impressive (see Obi and Obi, 2014).

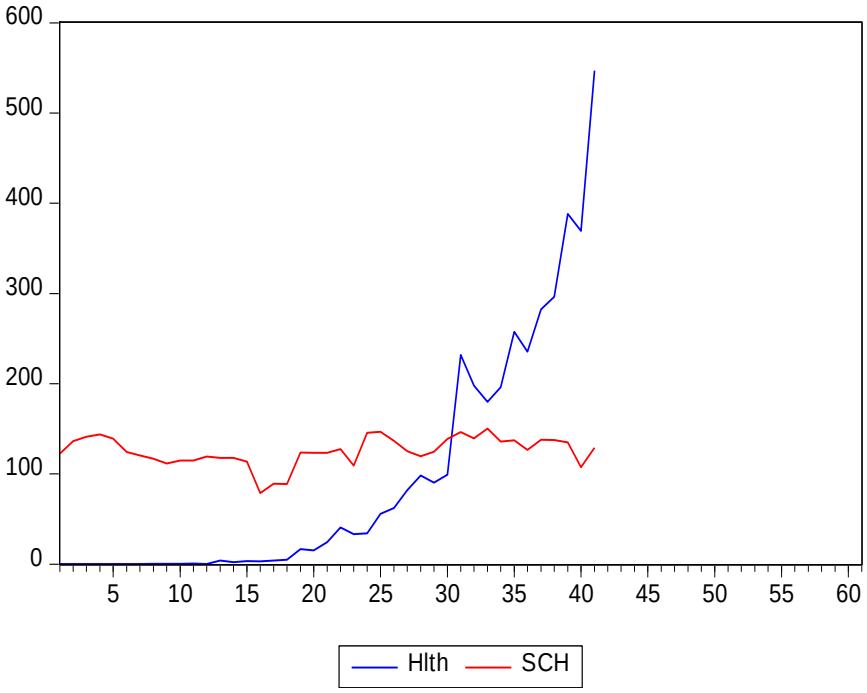


Figure 3: Government health expenditure and educational outcome

Source: Eviews based on data collected from the World Bank (2021) and CBN bulletin (2021)

The graph shows an upward trend in government health expenditure which indicates the increase in government expenditure. The school enrolment ratio indicated by the red line did not show an upward trend which is not impressive.Studies have established a relationship between government health expenditure and health outcomes (see Umar et al, 2022). However, studieshave not been able toestablish any direct link between government health expenditure andeducational outcome in Nigeria,thus, the relationship of government health expenditure and educational outcomes leaves one in doubt whether it is worth it to keep increasing government health expenditure. To clear this doubt, and attempting to answer the question, "does government health expenditure makes any significant impact on educational outcome?" This study examined the nexus between government health expenditure and educational outcome in Nigeria from 1981-2021.

Empirical Literature

Generally, it is believed that when government spends on education, education outcomes are affected all things being equal. For instance, the study of Obi and Obi (2014) empirically investigated the relationship that exists between government expenditure and educational outcome in Nigerian. The study employed the Johansen cointegration test and the Ordinary Least Square method. Data on the relevant variables were sourced from 1981 to 2012. The study discovered that there was no long-run relationship between the variables. An insignificant positive relationship between the variables was however discovered.

Also the study of Uzomba and Umar (2022)extended the work of Obi and Obi (2014) by investigating the impact of

government expenditure on education on educational outcome. The study proxy educational outcome with school enrollment ratio (Primary, Secondary and Tertiary) in Nigeria from 1981 to 2020. The study used Vector Autoregressive Lag Model and discovered that the impact of government health expenditure on educational outcome was negative.

A little has been done to establish a link between government health expenditure and educational outcome. Available literature considered the impact of health expenditure on human capital. Skills and training is a form of educational outcome. Among these studies isErasmus (2021) who investigated the impact of government expenditure on human capital in Nigeria from 1960 to 2019. Government expenditure was proxy with government expenditure on education and government expenditure on health and the human capital was proxy with by the Human Development Index. The study employed Ordinary Least Square and discovered a significant positive impact of government health and education expenditure on human capital in Nigeria. This implies that, whenever government health and education expenditure rise, human capital (educational outcome) improves and vice versa.

Likewise, Ogbonaya et al (2017) examined the relationship between government health expenditure and the human capital of Nigeria from 1990 to 2015. Employing Autoregressive Distributed Lag (ARDL) Model, the study found a positive relationship between government health expenditure and the human capital in Nigeria. That is, as government health expenditure was rising, human capital was equally rising. The finding of Erasmus conforms to this finding and both conclude that the governmenthealth expenditure of Nigeria affects the human capital of Nigeria positively.

Oluwatobi and Ogunrinola (2011) also investigated the impact of government health expenditure on human capital in Nigeria. Using secondary data the study examined the relationship between government health expenditure and human capital. The Solow Model was adopted in the study and the study found the government recurrent expenditure on health, education had a positive effect on the human capital development of Nigeria. Existing literature have not been able to bring out the true and direct relationship between government health expenditure and educational outcome in Nigeria which creates a gap that this research filled. Most of the existing literature only considered the relationshipbetween government health expenditure on health outcome or the human development index paying little or no attention to the link between government health expenditure and educational outcome in Nigeria. This research was conducted to fill that gap.

Theoretical Framework

Wagner (1883) stated the Law of the increasing extension of state activity. He maintained that there is always a long-run tendency for the scope of government to rise with increased levels of economic development. Wagner‘s hypothesis dealt with the increasing relative relevance of government activity and this theory is referred to as Wagner’s Law. Wagner(1883) opined that there are three reasons that

lead to an expanding scope of government activity: the first reason is, as nations develop, the complexity of legal relations and communications rises, urbanization and population density also occurs and it forces the government to establish the regulatory framework that accompanies the greater complexities in the relationships among economic agents. The second reason is, as income grows, societies begin to desire an increase in education, entertainment, more equitable distribution of resources, and an increase in government services. The third reason is the need for a large shrunk of capital infrastructure to meet technological requirements of an industrialized society, hence the need for government to intervene. The research adopted the Wagner's lawdue to its peculiarities that suits the Nigerian situation. Since Nigeria is developing nation, this theory suits it best

Methodology

Sources of Data and Method of Analysis

This study used time series data from 1981 to 2021. The data namely government health expenditure(HLTH), educational outcome proxy by school enrolment ratio (SCH), Gross domestic Product growth rate (GDR) and Infant Mortality rate (IFM)were sourced mainly from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank data base. The analytical and interpretational tool used by this study is the Vector Autoregressive Model (VAR). The Augmented Dickey Fuller Tests was used to test for the stationarity of the data while the Johansen Cointegration test was employed to test for a long run relationship in the model. The granger Causality was adopted by the study to also test for the cause and effect relationship between government health expenditure and educational outcome in Nigeria proxy by the school enrollment ratio.

Model Specification

$$\begin{bmatrix} SCHt \\ HLTHt \\ GDRt \\ IFMt \end{bmatrix} = \begin{bmatrix} \alpha_0 \\ \beta_0 \\ \sigma_0 \\ \Theta_0 \end{bmatrix} + \sum_{i=1}^{k} \begin{bmatrix} \Omega 11 & \Omega 12 & \Omega 13 & \Omega 14 \\ \Omega 21 & \Omega 22 & \Omega 23 & \Omega 24 \\ \Omega 31 & \Omega 32 & \Omega 33 & \Omega 34 \\ \Omega 41 & \Omega 42 & \Omega 43 & \Omega 44 \end{bmatrix} \begin{bmatrix} SCHt-1 \\ HLTHt-1 \\ GDPt-1 \\ IFMt-1 \end{bmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix}$$

The model is stated in a matrix form showing all the variables where

$\alpha_0 \beta_0, \sigma_0$, and$\Theta_0$= the constant intercept

Ω 11…… Ω 44= vector of parameters

$\mu_1, \mu_2, \mu_3, \mu_4$ = Error term

t= time.

Presentation of Results

TABLE 1: The Results of the ADF Unit Root Test

Variables	ADF Test Statistic	Critical Values at 5%	Remarks	Order of Integration
LnHLTH	-4.452048	-2.963972	Stationary	I(1)
IFM	-4.025549	-2.943427	Stationary	I(1)
SCH	-7.355348	-2.938987	Stationary	I(1)
GDR	-7.568223	-2.91263	Stationary	I(1)

Source: Author's Computation

Table 1 presents the results of the unit root test. All the variables in the model were integrated of order one at 5% level of significance showing that in level form they were non stationary which means they were random walk variables. After differencing them once, they became stationary. The test was conducted on the assumption that the variables had constants and no trend.

Cointegration Results

Table 2: The Johansens Cointegration Results

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob**
None*	0.510674	69.63625	54.07904	0.0011
At most I *	0.435372	42.47666	35.19275	0.0069
At most 2*	0.337573	20.75628	20.26184	0.0427
At most 3	0.125735	5.106146	9.164546	0.2720

Source: Author's Computation

Table 4.3 shows the result of the Johansen Cointegration test. From the result, the trace statistic is greater than the critical value at 0.05 (5%) level of significance at none, at most 1and at most 2. This means the variables have three cointegrating equations. The variables are cointegrated at the 5% level of significance. By being cointegrated, it means the variables have a long run relationship. A long run relationship implies that the variables move together and are related in the long run. That is, the variables can co-move in the long run. This further implies that the null hypothesis which says there is no long run relationship among the variable be rejected.

Optimal Lag Selection

Table 3: VAR Lag Order Selection Criteria Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-687.3623	NA	2.94e+10	35.45447	35.62510	35.51569
1	-522.5939	287.2884	143533 78	27.82533	28.67844*	28.13142
2	-497.7247	38.26038*	93683 54.*	27.37050*	28.90609	27.92145*

Source: Authors Computation

Table 4.5 presents the VAR Lag Order Selection Criteria. From the table, the LR, FPE, AIC, SC, and HQ showed that the optimal lag for the model is 2.

Table 4: Result of the VAR model

Variable	Coefficient	t-Statistic	Prob.
IFM(-1)	-0.046506	-0.01736	0.9862
IFM(-2)	-0.442747	-0.15131	0.8800
LHLTH(-1)	0.181907	2.37999	0.0189
LHLTH(-2)	0.141428	1.76492	0.0801
SCH(-1)	0.625373	3.53242	0.0006
SCH(-2)	0.064628	0.33936	0.7349
GDR(-1)	0.062486	0.22801	0.8200
GDR(-2)	0.017608	0.6528	0.9481
C	110.6829	1.88324	0.0621

Source: Authors Computation

Table 4 presents the results of the VAR Model for the second scenario where the study considered the relationship between school enrollment ratio and government health expenditure, infant mortality rate, and the GDP growth rate.

The estimated equation is:

$SCHt$=110.6829+ 0.625373 $SCHt_{t-1}$ + 0.064628 $SCHt_{t-2}$ + 0.181907ln $HLTH_{t-1}$+ 0.141428ln $HLTH_{t-2}$ -0.046506IFM_{t-1} - 0.442747IFM_{t-2} + 0.062486GDR_{t-1} + 0.017608GDR_{t-2}

The second equation revealed that the school enrolment ratio at time t-1 had a positive relationship with the school enrolment ratio at time t. The implication of this is, a 1% increase in the school enrolment ratio at time t-1 increased the school enrollment ratio at time t by 62.54%. This conformed with apriori expectation because; the school enrolment ratio of the previous year affected the school enrolment ratio of the current year positively. Also, the school enrolment ratio at time t-2 had a positive relationship with the school enrolment ratio of the current year. That is, a 1% change in the school enrolment ratio at time t-2 caused the school enrolment ratio at time t to rise by 6.46%. This also conformed to apriori expectation and theory.

Next, the result revealed the relationship between school enrolment ratio and government health expenditure on health. At time t-1, a 1% increase in government health expenditure increased the school enrolment ratio by 18.19%. While at time t-2, a 1% increase in government health expenditure increased school enrolment ratio by 14.14%. At time t-1 and t-2, the result conformed with apriori expectation and theorybecause; it is believed that only healthy children could enroll in schools. Therefore, as the government increased its expenditure on health, infant mortality rates reduced and school enrolment ratio increased.

Infant mortality rate was also seen to have a negative relationship with school enrolment ratio at t-1 and a negative relationship with school enrolment ratio at time t-2. At time t-1, the result revealed that a 1% increase in infant mortality decreased school enrolment ratio by 4.65% and at time t-2, a 1% increase in infant mortality rate caused school enrolment ratio to fall by 44.27%. That is, when there is an increase in infant mortality, school enrolment ratio falls and vice versa.

The relationship between school enrolment ratio and the real GDR was seen to be positive at time t-1 and positive at time t-2. At time t-1, the result indicated that a 1% rise in GDR caused school enrolment ratio to rise by 6.25%. At time t-2, the result showed that a 1% increase in GDR increased school enrolment ratio by 1.76%. At timet-1 and t-2, the results conformed with apriori expectation.

The constant intercept is 110.68 and insignificant. All the probabilities of the coefficient were above 0.05 (5%) except government health expenditure at lag 1 and school enrolment ratio at lag 1. Therefore, only government health expenditure at lag 1 and school enrolment ratio at lag 1were significant.

Autocorrelation result

Autocorrelation is not desirable in any model because it violates an important assumption of the classical regression model. For the purpose of this study, the VAR Residual Serial Correlation LM Tests was used to check for autocorrelation.

Table 5: Result of the Autocorrelation Test

Lag	LRE* stat	Df	Prob	Rao F-stat	Df	Prob
1	15.67847	16	0.4756	0.987937	(16, 70.9)	0.4792
2	38.74550	32	0.1915	1.262485	(32, 71.7)	0.2060

Source: Author's computation based on eviews

Since the Probability values are above 5%, the study concluded that there is no autocorrelation in the model. This means the error term of the different periods were not correlated. The study therefore accepted the null hypothesis that said that there is no autocorrelation in the model.

4.6: Result of the Heteroskedasticity Test

Chi-sq	Df	Prob
180.5515	160	0.1272

Source: Author's computation based on reviews. The probability value is above 5%. Therefore we cannot reject the null hypothesis implying that there is no heteroskedasticity in the model.

Discussions of Findings

This paper discovered that government health expenditure affected school enrolment ratio positively. At time t-1, the result revealed that the expenditure of the government of Nigeria on health increased school enrolment ratio which is a desirable outcome and at time t-2 the result remained constant. The implication of the result is that government health expenditure can have positive impacts on school enrolment ratio in Nigeria depending on how significant the amount spent on the health sector is. This implies that as health expenditure rises, school enrolment ratio rises. Past studies such Obi and Obi (2014), Uzomba and Umar (2022) only established a relationship between government expenditure on education and educational outcomes in Nigeria while Umar et al (2022) established a link between government health expenditure and health outcome.

None of these studies examined the link between government health expenditure and educational outcome in Nigeria. This study filled that gap by answering the question "does government health expenditure impacts educational outcome in Nigeria?" the findings of this work established a positive relationship between government health expenditure and health outcome in Nigeria. The findings of the study also validate the theoretical frame work used in the study. Wagner's hypothesis dealt with the increasing relative relevance of government activity by implication, an increase of government activities inform of expenditure have has

an impact on the economy. This implies that, so long as government increases health expenditure, the impact would be felt on the economy. The corresponding increase in educational outcome validates the theoretical frame work used in this study.The model was autocorrelation free and had homoskedasticity. This implied that the model had no serial correlation and had a constant mean. The implication of this result is that, the model is good and the results generated from the analysis are suitable for policy recommendation and forecast.

Conclusion

Health expenditure has the tendency to reduce infant mortality, the number of children that can enroll in school rises. This translated intoa positive relationship between government health expenditure in Nigeria and educational outcome. This paper therefore recommends that the government must consciously increase its expenditure on the health sector in order to improve not just the health sector but the educational sector which by implication raises the growth of the nation as shown by the findings of this study.

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