

THE EFFECT OF GOVERNMENT EXPENDITURE ON HEALTH AND EDUCATION ON HUMAN CAPITAL DEVELOPMENT IN NIGERIA. 1986-2020

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ABSTRACT

This paper evaluated the effect of government expenditure on health and education on human capital development in Nigeria. To achieve this. Vector Autoregressive (VAR) model, impulse response function was used to analyze the effect of government expenditure on health and education on human capital development in Nigeria using time series data from 1986 to 2018. The result revealed that government expenditure on education and health affected human capital development positively given its indices such as school enrollment rate, life expectancy rate and Literacy rate in Nigeria but government expenditure on education and health affected human capital development in Nigeria negatively through its index known as mortality rate. The study concludes that improvement in human capital development through increased government expenditure on education and government expenditure on health leads to increase in human capital development in Nigeria. However, human capital development measured by mortality rate leads to decline in human capital development in Nigeria. Therefore, the study recommends that government should ensure that expenditure on health as well as education is increased which will lead to a decline in mortality rate and in turn enhance human capital development towards achieving the desired level of economic growth in Nigeria.

Keywords: Human capital development, Education, Health

Background to the study

Globally, the most valuable assets in a nation are human resources (Hadir&Lahrech, 2015). This is because human capital is one of the key factors of production needed to achieve the desired level of economic growth. However, despite the huge population in most developing countries, they are yet to maximize the great potential embedded in human capital. This has been attributed to poor government expenditure in terms of health and education to enhance human capital

development (Ragan & Lipsey, 2005). Particularly, there is no country in the world that has achieved economic growth without a substantial and sustained investment in human capital development. Therefore, the role of human capital development in ensuring economic growth and development cannot be overemphasized as economists such as; Domar (1946), Grossman, Gupta and Chakroborty (2004) identified human capital development to be a key factor responsible for a country's economic growth.

Developing human capital is vital in Nigeria especially as the world is transitioning into a knowledge-powered economy. With the wave of automation and artificial intelligence threatening labour intensive jobs, Nigeria needs to improve the quality of education and expand access if it hopes to compete in the increasingly competitive world. Education and its complementary indicator health are essential needs for rapid growth and development through human capital development. This is because, health determines the overall structure of wellbeing of a person, and education is fundamental to human development, psychological wellbeing and reasoning which transmits into a rewarding life. Hence, both are fundamental to human capabilities in terms of creativity, innovations and productivity which are prerequisites for economic growth and development (Todaro & Smith, 2011).

Evidently in Nigeria, there has been a significant shortfall in educational funding necessary to realize sustainable level of economic growth in the country. This is because school enrollment which is a vital determinant of human capital development in the country falls short of the UNESCO standard holding to the fact that enrolment rate at various levels of educational institutions has often been used as a measure of educational attainment towards developing human capital to achieve economic growth in Nigeria. For instance, the adult literacy rate on average improved from 32% to 39% between 2003 and 2009. The pupil per teacher ratio in primary schools which was 30 in 1970, increased to 40 in 2015, 42 in 2016 and 45 in 2017. Based on standard, when compared to United Nations' minimum standard of 25 pupils per teacher (UNESCO, 2018). This implies that the country has not performed adequately well in terms of education to build human capital towards enhancing economic growth. National Bureau of Statistics (NBS, 2018) also reported that school enrollment rate in Nigeria which was 78% in 2017 increased to 81% in 2018 while total number of graduates per year increased to 69% in 2018 as compared to 55% recorded in 2017.

In the quest to develop human capital, health care which is an integral part of economic growth is a primary need of human. Hence, according to the World Health Organization (WHO, 2018), 50% of economic growth differentials between developed and developing nation is attributable to ill-health and low life expectancy rate amongst others. However, developed countries spend a high proportion of their Gross Domestic Product (GDP) on health care because they believe that their residents' health can serve as a major driver of economic growth and development. Due to

the quest to develop human capital through health care service delivery, government in Nigeria made deliberate efforts at ensuring that there is an increase in the level of public expenditure on health. For instance, recurrent expenditure on health increased by 40% between 1980 and 2018 (WHO, 2018). Despite the increase in public or government health expenditure, much impact has not been made in the area of reduction of infant mortality rate, infants under five and maternal mortality rate as infant and maternal mortality still remains high (World Health Organization, 2018). Furthermore, despite the increase in public health expenditure, the life expectancy ratio on the average has been on the decline in recent time in Nigeria.

It is worthy to be note that in the quest to develop human capital, increasing government expenditure on education and health are essential. However, reversed is the case in the Nigeria context as increased government expenditure on education and health meant to enhance human capital development has not transformed into economic growth. Hence, this study intends to examine the extent human capital development had impacted on economic growth in Nigeria.

Literature Review

Conceptual Review on Human capital development, Education and Health

Human capital development is defined as the training, skill acquisition and education of human resources of a country (Okojie, 1995). Human capital development involves increasing the quantity of people who have acquired skills, professionalism, technical know-how and required level of education to boost an economy or stimulate economic progress of a country. According to Okojie (1995), human resource development encompasses every creative and innovative person who is working and contributing his or her quota to economic growth or any person who is likely to be productive through employment later by undergoing the prerequisite training and education at a point in time.

Different research and empirical findings on the function of education in the economic progress show that education has positive impact on economic growth. "Educate a portion of the community and the whole of it benefits," The idea that education has positive externalities is by no means news anymore even that can be established by personal experiences. Classical economists such as Smith (1776) views the positive impact of education as very vital to the effective functioning of the entire economy as a whole and maintained that government should play an active role in support for education based on the positive externalities that the society as a whole would gain from a more educated labour force and populace (Van Den-Berg, 2001).

Nutrition and health play a substantive role in economic growth (Fogel, 2002). Long term impact of health on economic growth can be understood in the more general context of the relation between human capital development and economic growth. Human capital development is

understood as an intergenerational process of human capital accumulation that is slowed down by market failures that can be strong enough to result in poverty traps. In turn, human capital development has a dynamic interaction with long term economic growth drawing from the economy, their resources for human capital investment and returning it to a generation. In this long term context, it is easy to see that health and in particular, early child development plays a crucial role in human capital investment and therefore in long term economic growth.

Empirical Review

There is plethora of literature that have discussed human capital development, education and health in Nigeria. The literature reviewed followed a trend on the discussion of human capital development in Nigeria over time. Matthew (2018) investigated the relative impact of human capital formation on economic growth in Nigeria from 1981 to 2014. The study found that a long run dynamic relationship existed between human capital formation and economic growth in Nigeria. Matthew (2018) recommended that in order to achieve economic growth, policymakers should inter-alia increase not just the amount of expenditure made on the education sector, but also the percentage of its total expenditure accorded to the sector. Moreover, improve personnel development in the health care and ensuring adequate distribution of health facilities within the federation is essentially imperative.

Okumoko, Tubo, Omeje, and Udoh (2018) studied the dynamics of human capital development and economic growth in Nigeria. The aim of the study was to examine the impact of human capital development on industrial growth in Nigeria. The study applied the ARDL techniques on the time series data spanning from 1976-2016. The findings showed that moved towards equilibrium in the long-run. Their findings also showed that recurrent expenditure on education and health has a negative impact on industrial growth. The study argued that rigorous pursuance of graduate skill acquisition programmes as well as adherence to the 26 per cent minimum budgetary allocation demanded by UNESCO for education which will spur improvement in human capital development will impact industrial growth positively. More-so, incentives such as tax holidays, pioneer reliefs and exemptions that aids increased investment in industrial growth be vigorously pursued by governments at all levels in Nigeria.

Surya (2017) investigated the relation between human capital and economic growth in developing countries around the world. The objective of the study was to examine the effect of human capital on economic growth in developing countries during the period of 2010 -2015. Using the OLS regression analysis, the study found that human capital significantly and positively affects economic growth in most developing countries. The work of Surya (2017) showed that the key indicators affecting economic growth in developing nations include; working age population, level of education, literacy rate, life expectancy and investment in

technology. Apart from the aforementioned factors, other variables that significantly affects some of the developing countries include; birth and death rate.

The findings of Ogundele et al (2017) implied that education and health are indispensable in achieving economic growth in Nigeria. The study suggested that the Nigerian government should ensure allocation of adequate resources for the development of human capital in order to enhance economic growth in Nigeria. The study also recommended that going forward the government and policy makers should increase its total expenditure on education, ensure sufficient budgetary allocation on health expenditure, and ensure a standard is set across all secondary and tertiary institutions in the country so that proper human capital required for any individual to become productive and economic growth is enhanced.

Paul and Akindele (2016) examined the impact of human capital development on economic growth in Nigeria using time series data spanning from 1980 to 2013. The objective of the study was to explore the relationship between human capital indices (education and health) and economic growth. The study employed ARDL Co-integration analysis to estimate the relationship among the variables used in the study. The findings from the study revealed that the long-run relationship among secondary school enrolment, public expenditure on education, life expectancy rate, gross capital formation and economic growth although positive is statistically insignificant. The findings in Paul and Akindele (2016) also showed that there is negative long-run relationship among primary, tertiary school enrolment, public expenditure on health and economic growth. In line with the findings, the study recommended that government should put in place the required education and training policy that would guarantee quality schooling for primary and tertiary education. Government should also commit more funds to health sector to enhance human capital development.

Jaiyeoba (2015) studied human capital investment and economic growth in Nigeria. The aim of the study was to investigate the relationship between investment in education and health on economic growth in Nigeria, using time series data from 1982 to 2011. The study employed trend analysis, the Johansen cointegration and ordinary least square technique. The study found a long-run relationship between government expenditure on education, health and economic growth. The study also showed that health and education expenditure, secondary and tertiary enrolment rate and gross fixed capital formation have positive and significant effect on economic growth. The study however found that there is no evidence of the effect of primary school enrolment on economic growth. The findings of Jaiyeoba (2015) have strong implications on education and health policies in that there is need for the government to increase investment on education and health so as to accelerate economic growth and liberate the citizens from the vicious cycle of poverty.

Ehimare, Ogaga-Oghene, Obarisiagbon and Okorie (2014) investigated the efficiency of government expenditure on human capital development in Nigeria. The level of human capital development, which is a reflection of the level of health and education of a nation affect the level of economic activities in that nation. In order to capture the efficiency of government expenditure on human capital development in Nigeria, the data analysis was conducted using Data Envelopment Analysis involving Input Oriented Variable Return to Scale. The findings of the study revealed that there has been significant reduction in the efficiency of government expenditure since 1990 up till 2011 which has been decreasing. This result therefore could be evidenced from the poor quality and output experienced in the Nigerian education sector. It is therefore recommended that efforts should be made to encourage, promote self-dedication, commitment and service delivery in order to improve on the quality of educational output in Nigeria in terms of quality of human capital and capacity building.

Olalekan (2014) examined the effect of human capital on economic growth in Nigeria using annual data on health and education, from 1980 to 2011. The study adopted Generalized Method of Moment (GMM) techniques in the analysis and the estimated results provided evidence of positive relationship between human capital and economic growth in Nigeria. The study therefore recommended that special attention should be given to health and education sectors simultaneously in Nigeria, such as increased budgetary allocation to the two sectors and to ensure proper implementation of programs in these two sectors in other to increase returns from these two sectors.

Ibok and Ibanga (2014) investigated the impact of human capital development and economic empowerment on the socio-economic development of Akwalbom state. The study adopted a historical and descriptive approach in data allocation. The study revealed that from 1999 to 2012, the government being the foremost driver of the economy has made a positive impact on the training and re-training of workers in the public sector. The study also revealed that, aside from training, the government also embarked on elaborate empowerment programs which has helped so many people to become self- employed as well as employers of labours.

Ajadi and Adebakin (2014) evaluated the effect of human capital development on economic growth in Nigeria. The study adopted descriptive survey research and multi-stage sampling technique was used to select a total of 200 respondents used for the study. Data collected were analyzed using the Pearson's Product Moment Correlation Coefficient. The work of Ajadi and Adebakin (2014) showed that education has a predictive r-value of 0.76 on individual personal income and the nature of job (employment) is related to individual personal income ($r=0.64$). They argued that economic growth is a function of individual income level and recommended that government should develop appropriate educational policy to provide the human capital need of the society for economic growth.

Adelakun (2011), studied human capital development and economic growth in Nigeria. The aim of the study was to evaluate the relevance of human capital development to the Nigerian economy. The study employed ordinary least square (OLS) regression to analyze the relationship between human capital development and economic growth. The study revealed that there is strong relationship between human capital development and economic growth. The study recommended that proper institutional framework should be put in place to look into manpower needs of various sectors and implement policies that can lead to the overall growth of the economy.

Oluwatobi and Ogunrinola (2011), studied the implications of government expenditure on human capital development on economic growth in Nigeria. The aim of the study was to examine government's recurrent and capital expenditures on education and health in Nigeria and their effects on economic growth. The study employed the Vector Error Correction Mechanism (VECM) in its analysis. The study showed that there exists a positive relationship between government recurrent expenditure on human capital development and the level of real output, while capital expenditure is negatively related to the level of real output.

Theoretical Framework

Human Capital Theory

Human capital theory was propounded by Schultz (1960, 1961) and Becker (1964) to explain the relationship between knowledge and economic growth. Human capital theory maintains that education contributes directly to growth by improving the knowledge, qualifications, skills and productive capacities of individuals. The theory also identifies education as the principal institutional mechanism of production, accumulation and diffusion of human capital. It produces and circulates market and non-market benefits, externalities and spillovers. The investment in education leads to the formation of human capital, which is comparable to physical capital (Lucas, 1988; Romer, 1986, 1990; Loening, 2004; et all).

The proponents of human capital theory argued that education is key to human capital development and economic growth. They asserted that physical capital contributes only a small portion to growth of income and human satisfaction. Consequently, they maintained that education and skill acquisition constitute the main component of human capital development in every economy that seeks growth and development. Knowledge through education they argued is key to ever increasing productivity and capacity building and education has become very important and crucial factor in the modernization of production systems and the economic behavior of individuals which is largely inevitable in every given society or economy.

Human capital theory is premised on the assumption that education is an investment which produces multiple incomes in the future. Consequently, differences in productivity arising from differences in education are reflected in wage gaps as a result of the level of training or the level of education acquired. So basically, the higher the level of education and skill in any given society, the higher the potential level of income tends to be in the labour market. Models of human capital emphasize the effect of education on individual's demand for education as a function of rational human behavior and education provides the technical knowledge necessary to increase individual productivity. This in turn, leads to higher employment, income and condition of living.

According to Hanushek and Wobman (2007), a person's resolution to invest in education is related to the resolution to invest in physical capital or physical stock. When determining whether to invest in education, individuals evaluate the future advantages and opportunities this could bring if the process continued, as well as the costs of the investment. The importance of human capital theory lies in its description of education as an investment which not only has a positive impact on individuals (in terms of income), but also on the society as a whole, increasing employment, economic growth and social equity.

The basis of this theory is that investing in education is not just an achievement in terms of income alone, but economic planning and human capital development which in return gives the larger society a bigger advantage of meeting the basic or the required development, in terms of wealth creation, employment generation, and sustainability among others.

Methodology

Sources of Data and Method of Analysis

The study utilized time series data which span the period of 1986 to 2018. These data were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin 2018, UNESCO (2018) and World Bank Development Index (WDI, 2018). The variables of interest include; Gross Domestic Product Growth Rate (GDPGR) measured in percentage as proxy for economic growth being the dependent variable and the independent variables are government expenditure on education (GEE) which is the total government expenditure (capital and recurrent expenditure) on education measured in billions of naira. Government expenditure on health (GEH) is the total government expenditure (capital and recurrent expenditure) on health measured in billions of naira. School enrolment rate (SER) is the total number of children enrolled in a year. This is measured as the percentage of gross primary and secondary enrolment. Life expectancy rate (LER) is the average life expectancy at birth measured in years. Literacy rate (LIR) is the total number of literate persons in a given group, it is measured as a percentage of the total population

and mortality rate (MOR) is the number of death measured per 1000 lives. The table below shows the variables used in the study and sources.

VAR was used to achieve objective two of the study because it is relatively easy to determine causality in the long run and short-run dynamics, as long as the variables are co integrated (Engle & Granger, 1987). The major highlight of the use of VAR is that in the system, there is no discrimination between endogenous and exogenous variables. Hence, all variables are treated as endogenous and VAR system does not impose a-priori restrictions on structural relationships. The standard form of VAR model with lag order p as is represented below.

$$Y_t = C_0 + \sum_{i=1}^p (A_i Y_{t-1} + \varepsilon_t) \dots\dots\dots 1$$

Where; Y_t represents the vector of endogenous variables, C_0 is a vector of constants; A_i denotes the matrices of autoregressive coefficients and ε_t is a vector of white noise processes.

The reduced-form VAR model in this study consisted of six (6) variables to ascertain the effect of government expenditure on health and education on human capital development in Nigeria. The vector below in equation 2 satisfied the variables for the VAR model in this study

$$HCD = \begin{pmatrix} GEE \\ GEH \\ SER \\ LER \\ LIR \\ MOR \end{pmatrix} \beta = \begin{pmatrix} \beta_{1E1} \\ \beta_{2E2} \\ \beta_3 \\ \beta_{4E4} \\ \beta_{5E5} \\ \beta_{6E6} \end{pmatrix} E_t = \begin{pmatrix} E3 \end{pmatrix} \dots\dots\dots 2$$

The explicit form of the VAR system of equation model was stated below, where the variables of interest which were indicators of human capital development include; government expenditure on education (GEE), government expenditure on health (GEH), school enrollment rate (SER), life expectancy rate (LER), literacy rate (LIR) and mortality rate (MOR).

$$GEE_t = \alpha_0 + \sum_{i=1}^p \delta_i GEE_{t-1} + \sum_{k=0}^p \beta_k GEH_{t-k} + \sum_{k=0}^p \epsilon_k SER_{t-k} + \sum_{l=0}^p \gamma_l LER_{t-l} + \sum_{m=0}^p \varphi_m LIR_{t-m} + \sum_{n=0}^p \Psi_n MOR_{t-n} \dots \dots \dots 3$$

$$GEH_t = \alpha_0 + \sum_{i=1}^p \delta_i GEH_{t-1} + \sum_{k=0}^p \beta_k GEE_{t-k} + \sum_{k=0}^p \epsilon_k SER_{t-k} + \sum_{l=0}^p \gamma_l LER_{t-l} + \sum_{m=0}^p \varphi_m LIR_{t-m} + \sum_{n=0}^p \Psi_n MOR_{t-n} \dots \dots \dots 4$$

$$SER_t = \alpha_0 + \sum_{i=1}^p \delta_i SER_{t-1} + \sum_{k=0}^p \beta_k GEE_{t-k} + \sum_{k=0}^p \epsilon_k GEH_{t-k} + \sum_{l=0}^p \gamma_l LER_{t-l} + \sum_{m=0}^p \varphi_m LIR_{t-m} + \sum_{n=0}^p \Psi_n MOR_{t-n} \dots \dots \dots 5$$

$$LER_t = \alpha_0 + \sum_{i=1}^p \delta_i LER_{t-1} + \sum_{k=0}^p \beta_k GEE_{t-k} + \sum_{k=0}^p \epsilon_k GEH_{t-k} + \sum_{l=0}^p \gamma_l SER_{t-l} + \sum_{m=0}^p \varphi_m LIR_{t-m} + \sum_{n=0}^p \Psi_n MOR_{t-n} \dots \dots \dots 6$$

$$LIR_t = \alpha_0 + \sum_{i=1}^p \delta_i LIR_{t-1} + \sum_{k=0}^p \beta_k GEE_{t-k} + \sum_{k=0}^p \epsilon_k GEH_{t-k} + \sum_{l=0}^p \gamma_l SER_{t-l} + \sum_{m=0}^p \varphi_m LER_{t-m} + \sum_{n=0}^p \Psi_n MOR_{t-n} \dots \dots \dots 7$$

$$MOR_t = \alpha_0 + \sum_{i=1}^p \delta_i MOR_{t-1} + \sum_{k=0}^p \beta_k GEE_{t-k} + \sum_{k=0}^p \epsilon_k GEH_{t-k} + \sum_{l=0}^p \gamma_l SER_{t-l} + \sum_{m=0}^p \varphi_m LER_{t-m} + \sum_{n=0}^p \Psi_n LIR \dots \dots \dots 8$$

Presentation and Discussion of Results

The variables utilized in the study include; gross domestic product growth rate (GDPGR) (as proxy for economic growth being the dependent variable), government expenditure on education (GEE), government expenditure on health (GEH), school enrollment rate (SER), life expectancy rate (LER), literacy rate (LIR) and mortality rate (MOR) were the independent variables.

Table 1: Descriptive Statistic Results

Statistics	GDP_GR	GEE	GEH	LER	LIR	MOR	SER
Mean	4.781515	123.4845	67.22121	47.50403	32.98898	101.1576	123.0807
Median	4.630000	64.78000	33.27000	47.24200	29.61322	105.6000	123.0736
Maximum	15.33000	390.4200	257.7200	54.93900	56.20540	125.7000	149.8754
Minimum	0.060000	0.230000	0.040000	5.923000	20.43400	64.60000	98.89400
Std. Dev.	3.489208	139.1551	80.39462	8.081660	9.828828	22.12798	11.53623
Skewness	0.859421	0.814745	0.998961	-4.211284	0.651024	-0.330110	0.071641
Kurtosis	3.892950	2.043746	2.643155	22.67205	2.162298	1.592454	2.439834

Jarque-Bera	5.158692	4.908283	5.663664	629.6524	3.295974	3.323480	0.459684
Probability	0.075824	0.085937	0.058905	0.000000	0.192437	0.189808	0.794659
Sum	157.7900	4074.990	2218.300	1567.633	1088.636	3338.200	4061.663
Sum Sq. Dev.	389.5862	619652.9	206825.4	2090.023	3091.388	15668.72	4258.710
Observations	33	33	33	33	33	33	33

Table 1 shows the descriptive statistic of the variables used in the model. It indicates that the gross domestic product growth rate (GDPGR) has a mean value of 4.78 with maximum and minimum values of 15.33 and 0.06 respectively. The standard deviation which measures the spread in the series is 3.489 implying that the series is widely dispersed from the mean. The Jarque-Bera statistics shows that GDPGR is normally distributed with a kurtosis of 3 and a skewness of 0.85. The descriptive statistics further shows that government expenditure on education (GEE) has a mean of 123.48 with a maximum and minimum value of 390.42 and 0.23 respectively. The standard deviation is 139.15 implying that the spread of the series from its mean is high. The JarqueBera statistics also shows that the series is normally distributed.

Table 1 shows that the mean value of government expenditure on health (GEH) is 67.22 the maximum and minimum values within the study period are 257.72 and 0.04 respectively. The JarqueBera statistics indicates that the series are normally distributed. The kurtosis for the series is 2.64 and the skewness is 0.99. It mirrors a normal skewness and platykurtic because 2.64 is less than 3. The statistic further shows that life expectancy ratio (LER) has a mean of 47.50 and a maximum and minimum values of 54.94 and 5.92 respectively, with a skewness of -4.21 and a kurtosis of 22, which means that the distribution is not normal because the skewness is negative which can also be confirmed from the high value of the kurtosis(leptokurtic) because 22 is greater than 3.

The statistics further shows that literacy rate (LIR) has a mean of 32.99 with a maximum and minimum values of 56.21 and 20.43 respectively. The standard deviation is 9.83 implying that the spread of the series from its mean is high. The JarqueBera statistics also shows that the series is normally distributed. The table also shows that the mean value of mortality rate is 101.16 the maximum and minimum values within the study period are 125.7 and 64.60 respectively. The kurtosis is 1.59 which is less than 3 (platykurtic) which means that it is not a normal distribution, also the distribution is negatively skewed as seen from the table with a skewness value of -0.33.

Lastly, the descriptive statistics for the school enrolment rate (SER) shows that the mean value is 123.08 while the maximum and minimum values within the study period are 149.88 and 98.89 respectively. The kurtosis for the series is 2.44 and the skewness is 0. It mirrors a normal skewness and platykurtic because 2.44 is less than 3.

Unit Root Test

To further examine the behavior of each of the variables over time, the study carried out a unit root test so as to determine whether the variables are stationary. The Augmented Dickey Fuller (ADF) unit root test was carried out to ascertain the order of integration and test for the presence of unit roots. The results are presented in table 2 below.

Table 2: ADF Unit Root Test

Variables	ADF Statistic at level	ADF Statistic at first difference	Critical values of 5% level	Critical values of 5% at first difference	P-values at level	P-values at first difference	Order of integration
GEE	-1.493736	-6.398763	-2.960411	-2.963972	0.0765	0.0000	I(1)
GEH	-3.487392	-	-2.960411	-	0.0034	-	I(0)
SER	-2.349839	-5.483923	2.960411	-2.963972	0.3458	0.0000	I(1)
LER	-1.587463	-7.493736	-2.960411	-2.963972	0.2387	0.0012	I(1)
LIR	-3.454839	-	-2.960411	-	0.0003	-	I(0)
MOR	-1.345324	-6.389282	2.960411	-2.963972	0.6847	0.0000	I(1)

Table 2 reveals the results of the unit root test for the variables in this study. Apart from government expenditure on health (GEH) and literacy rate (LIR) that are stationary at level, the other variables are not stationary at level. However, at first difference GDPGR, GEE, SER, LER and MOR became stationary at 5% level of significance. Since the variables are integrated at different order the study employs the autoregressive distributed lag (ARDL) model to estimate the long and short run effect of human capital on economic growth in Nigeria. Before conducting

the ARDL regression; the study carried out optimal lag length selection and the ARDL bound cointegration test so as to determine the maximum lag and whether cointegration exist among the variables.

To evaluate the effect of government expenditure on education and health on human capital development in Nigeria, the study employs the VAR estimation techniques. The VAR is a system of equation that helps in identifying whether or not an identified variable significantly affects other variables and vice versa. Using a selected lag length of 1, the result of the VAR model is presented in table 4.6

Table 4.6: VAR Results

	GEE	GEH	SER	LER	LIR	MOR
GEE(-1)	0.332315 (0.23842) [1.39384]	-2.487965 (4.25558) [-0.58464]	0.591835 (0.20918) [2.82926]	0.593207 (1.01234) [0.58598]	0.653389 (0.86289) [0.75721]	-3087152. (2843487) [-1.08569]
GEE(-2)	0.209944 (0.21655) [0.96952]	-0.180295 (3.86519) [-0.04665]	0.137897 (0.18999) [0.72580]	0.301808 (0.91947) [0.32824]	0.018349 (0.78373) [0.02341]	-1806653. (2582638) [-0.69954]
GEH(-1)	0.008279 (0.02304) [0.35930]	0.859286 (0.41128) [2.08928]	0.050974 (0.02022) [2.52137]	0.192292 (0.09784) [1.96541]	0.114756 (0.08339) [1.37606]	-543177.6 (274811.) [-1.97655]
GEH(-2)	-0.012859 (0.02190) [-0.58724]	0.316349 (0.39086) [0.80938]	0.241262 (0.01921) [12.5575]	0.095820 (0.09298) [1.03056]	0.071283 (0.07925) [0.89945]	-281418.4 (261161.) [-1.07757]
R-squared	0.844545	0.848777	0.993564	0.987786	0.853467	0.936512
Adj. R-squared	0.734812	0.742031	0.989021	0.979165	0.750032	0.891697
F-statistic	7.696368	7.951383	218.6988	114.5746	8.251251	20.89724

(.) = standard errors; [.] = t-values

Table 4.6, depicts the VAR result of the effect of government expenditure on human capital development in Nigeria. The table shows that for the equation of government expenditure on education (GEE), the effect of government expenditure on all the variables of concern are insignificant. In the equation for government expenditure on health, the first lag is significant and positive at 5 percent level of significance. This implies that GEH has significant effect on GEH. The equation for SER shows that the lag of GEE and GEH have significant and positive effect on SER at 5 percent level of significance. This indicates that the first lag of GEE and GEH and the second lag of GEH have significant effect on SER in Nigeria. The equation for LER, LIR and MOR shows that the lag of GEE and GEH are not significant which means that GEE and GEH do not have significant effect on LER, LIR and MOR.

To clearly examine each of the variable that constitutes human capital development and their response to government expenditure, the study employs the impulse response function (IRF). The IRF identifies the response of a dependent variable in a VAR system when there is a shock in the error term (innovation) of each equation in specified VAR equation. The IRF order of innovation follow the cholesky adjusted method. The impulse response function graph is displayed in figure 1 and 2.

Figure 1 shows the IRF graphs for GEE, GEH, SER, LER, LIR and MOR using the cholesky one standard innovation. The aim is to examine the response of GEH, GEE, SER, LER, LIR and MOR to unanticipated shock in GEE.

Response to Cholesky One S.D. (d.f. adjusted) Innovations \pm 2 S.E.

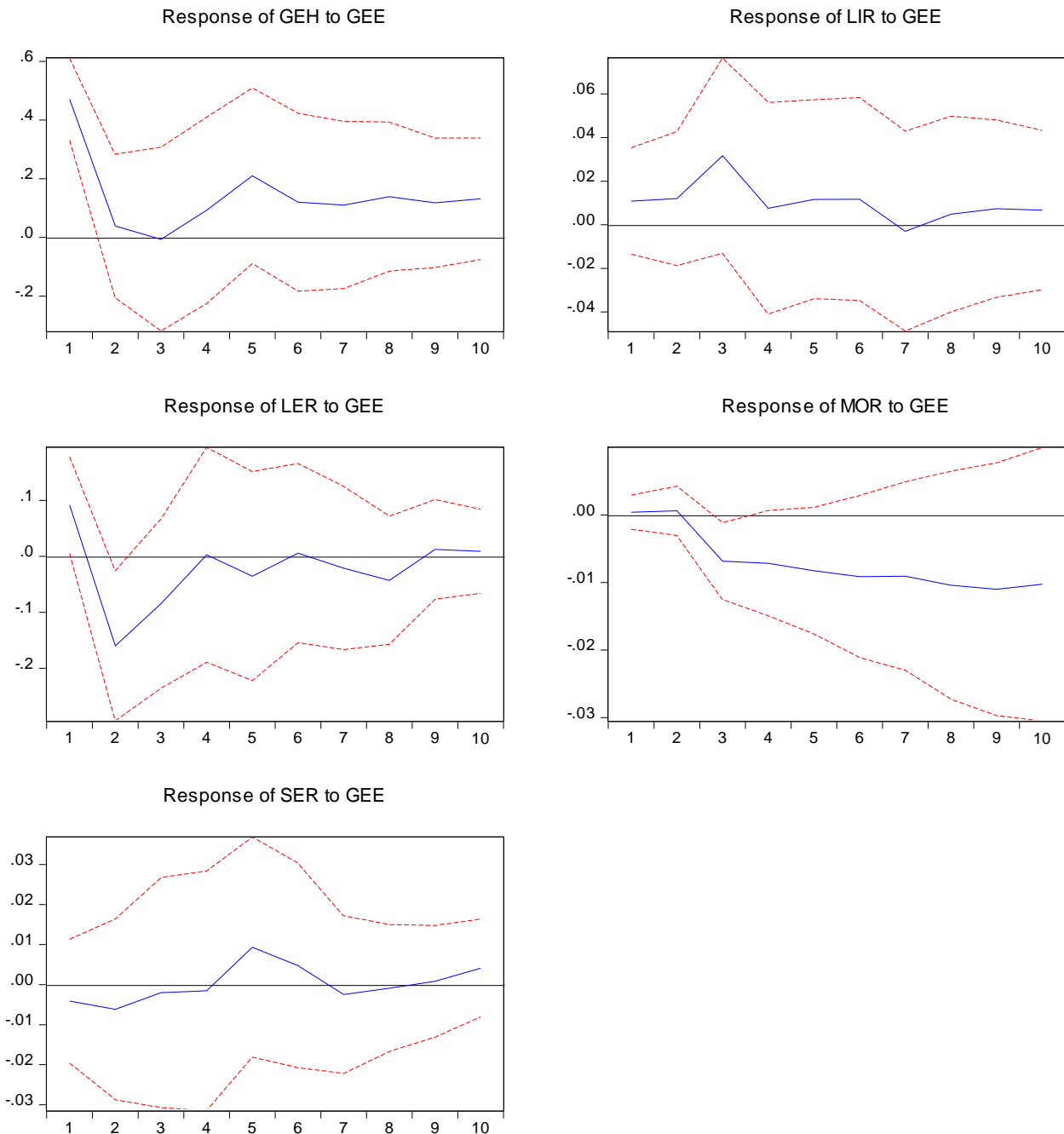


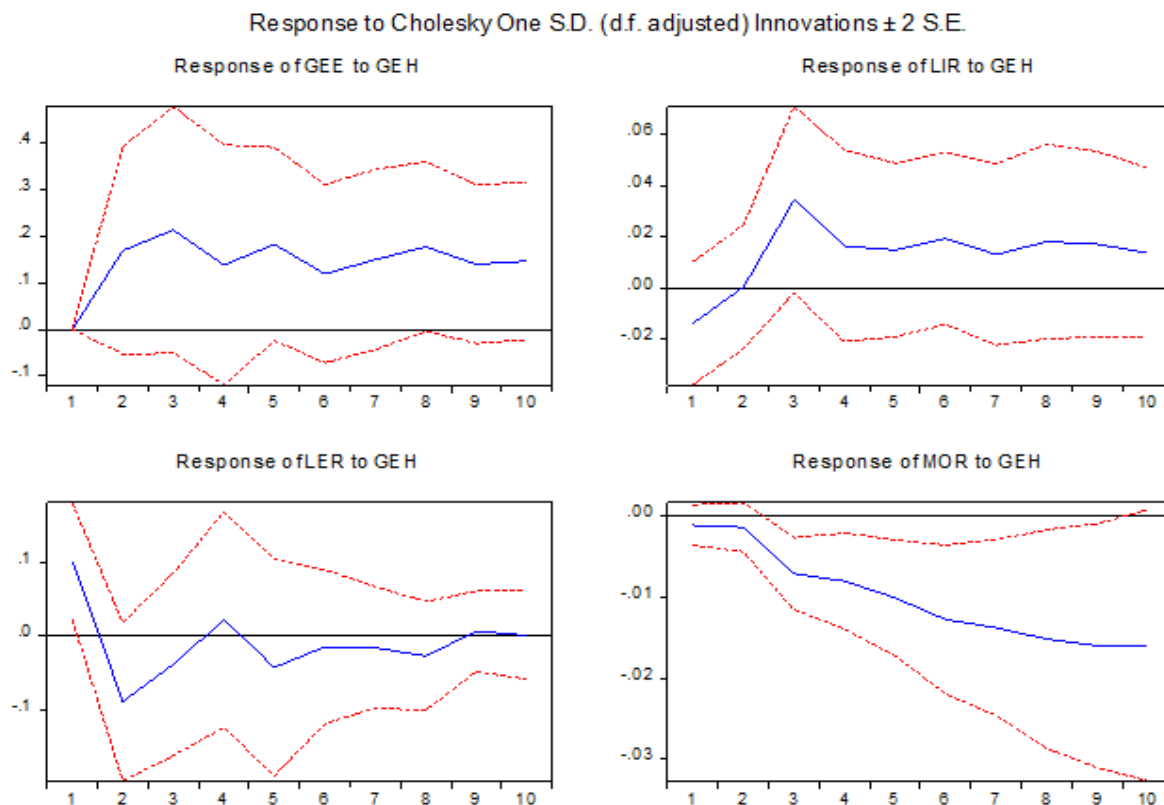
FIGURE 1: Impulse Response Function of GEH, LIR, LER, MOR and SER to GEE.

Figure 1 depicts the response of the variables under consideration to a change in government expenditure on education (GEE), response of government expenditure on health (GEH) to a one

S.D shock to GEE immediately starts to decline from period 1 to 3. The effect is however positive all through the period. This implies that increase in government expenditure on education (GEE) increases government expenditure on health (GEH).

The response of LIR to a one SD shock to GEE initially has a positive effect except for period 7. Although the response of LIR is positive the response is not large. The result implies that increase in government expenditure on education (GEE) increases literacy rate but not large. Figure 1 also shows that response of LER to a one SD shock to GEE does not have significant effect on LER. The implication is that the increase in government expenditure on education does not affect life expectancy. The response of MOR to a one S.D shock to GEE initially has no noticeable effect on MOR from period 1 and 2. But however, GEE has negative effect through the remaining periods. This implies that increase in government expenditure decreases mortality rate in the long run.

The response of SER to a one S.D shock to GEE is insignificant. This implies that the increase in government expenditure does not affect the rate of school enrolment in Nigeria. To examine the response of GEE, LIR, LER, MOR and SER to shock in GEH, the impulse response function graph is shown in figure 2.



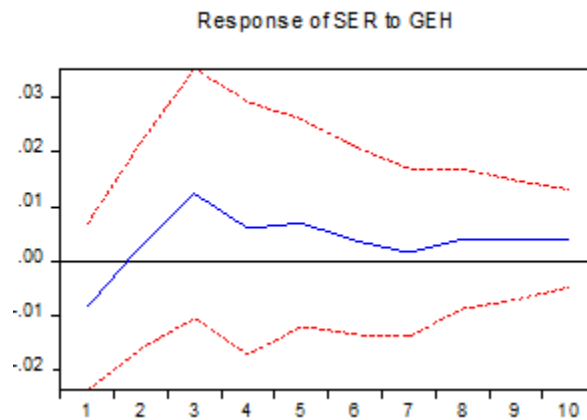


FIGURE 2: Impulse Response Function of GEE, LIR, LER, MOR and SER to GEH.

Figure 2 shows the response of the variables under consideration to shocks in GEH. Figure 2 reveals that the response of GEE to a one S.D shock to GEH is positive. This implies that an increase in government expenditure on health, increases government expenditure on education. The response of LIR to a one S.D shock to GEH is positive and significant from period 2 to period 10. This implies that an increase in government expenditure on health increases literacy rate in the long run.

The response of LER to a one S.D shock to GEH has negative effect on LER as seen in the IRF graph. This implies that a shock to GEH has a negative and insignificant effect on LER. Response of MOR a one S.D shock to GEH has a negative impact on MOR all through the different periods. This implies that an increase in GEH will have a negative and significant effect on MOR in the long run, meaning an increase in government expenditure on health decreases mortality rate in Nigeria. The response of SER to a one S.D shock to GEH has an immediate positive effect on SER. This implies that an increase in government expenditure on health increases school enrolment rate in the long run.

Conclusion and recommendations

Based on the result of the study, which revealed that government expenditure on education affected human capital development positively given its indices such as school enrollment rate, life expectancy rate and Literacy rate in Nigeria within the study period. Hence, increase in government expenditure on education led to increase in human capital development in Nigeria through its indices such as school enrollment rate, life expectancy rate and literacy rate within the study period, but government expenditure on education affected human capital development in Nigeria negatively through its index known as mortality rate.

The result also revealed that government expenditure on health affected human capital development positively given its indices such as school enrollment rate, life expectancy rate and literacy rate in Nigeria within the study period. Hence, increase in government expenditure on health led to increase in human capital development in Nigeria through its indices such as school enrollment rate, life expectancy rate and literacy rate within the study period, but government expenditure on health affects human capital development in Nigeria negatively as mortality rate decreases with increase in government expenditure on health which agrees with a priori expectation. Based on the test of hypothesis, the study concluded that government expenditure on education and health affects human capital development in Nigeria.

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