



THE IMPACT OF HUMAN CAPITAL DEVELOPMENT ON ECONOMIC GROWTH IN NIGERIA

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Abstract

This study investigates the impact of human capital development on economic growth between 1986 and 2018 in Nigeria. The study employs the OLS, Cointegration test and causality test approach and the result of the study revealed that the effect of government recurrent expenditure on education (EDUC) is positive but statistically insignificant at 5percent level of significance. The impact of government expenditure on health (HLTH) for the period of 1987 to 2016 had positive impact on real output as expected but is insignificant at 5percent level of significance in explaining the level of the output. The coefficient death rate (DER) is positively signed as expected but statistically insignificant at 5 percent level of significance. This confirms the basic thesis of the Harrod-Domar Growth Model. The theory recogniserecognised the role of human capital stock. Thus, the increase in a country's mortality rate decreases the economy's potential output. The result of causality test shows that EDUC does not Granger causes RGDP but RGDP does. Therefore, the conclusion is that there is a one-way causation running from RGDP to EDUC. However, there exist no causation between HLTH and real output

Keywords: Capital, Development, Growth, Nigeria

1. Introduction

Per capital output growth is a key component of economic welfare (Abramowitz, 1981). Investment in human capital is the basis of growth and development in developed and emerging economies. The experiences of developing countries like Nigeria is overwhelming for instance, The percentage of the Federal Government budget in Nigeria for the period of 2011 to 2015 for health and education were 3.077% and 6.3% in 2011, 2.74% and 7.8% in 2012, 4.4% and 7.2% in 2013 and 5.01% and 6.6% in 2015 respectively instead of 26.0% as recommended by the United Nation's scientific and cultural organisations (UNESCO) and this has many negative implications for the growth of the nation.

Economic development theorists (Schultz 1961, Fagerhind and Saha 1997) generally agree that the quality of human capital has significant impact on economic growth. This body of thinking is of the opinion that the quality and quantity of labour determine production by virtue of it being a factor of production. Moreover, improving the quality of the work force yields implicit, non-economic outputs related to the generation of ideas and decisions, which have a significant positive impact on investment, innovation and other growth opportunities (Roux, 1994). To Adenuga (2010), the wealth and vitality of nations rest ultimately upon the development of people and the effective commitment of their energies and talents. Capital and natural resources



are passive agents. The active agents of modernisation are human beings, for they alone can accumulate capital, exploit natural resources and build political and social organisations. The poor output per capital is alarming; this makes the World Bank to recommend 25% of budgetary allocation to the educational sector. Despite that, the issue continued to be acute. In Nigeria, government efforts in the development of human capital have fallen below the standard of annual budget. The percentage of the Federal Government budget to education in Nigeria is poor and is not commensurate with the benchmark by United Nation's Scientific and Cultural Organisations (UNESCO) which continued to have many negative implications for the growth of the nation. Although the government has designed policies to improve human capital in the area of launching wide ranges of social investment program which caters for human development. This includes a budget allocation of 500 billion provided in 2016 and 2017 as well as 2018 budget proposal. This poses a concern for the sector oral development. It is in view of this that this study intends to investigate the effect of public spending on education/health on economic growth in Nigeria; and Ascertain the direction of causation between public spending on education/health and economic growth in Nigeria.

2. Literature Review

The fundamental formal body of the Human Capital Theory can be pursued by the effort of Becker (1964) titled "Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education." He recognised that the primary inspiration factor has likely been an acknowledgment that the development of physical capital, in any event at expectedly estimated, clarifies a generally little piece of the development of wage in many nations. The exploration for better clarifications has prompted enhanced proportions of physical capital and to an enthusiasm for less unmistakable elements, for example, innovative change and human capital. Likewise, behind this worry is the solid reliance of military technology on training and aptitudes, the fast in uses on instruction and wellbeing, the deep rooted mission for an understanding of the individual dissemination of pay, the ongoing development in joblessness in the United States, the Leontief rare factor Catch 22, and a few other vital economic issues.

Empirically, Loening (2002) in a study examined the short-run effect of human capital on economic development in Guaztemala for the period 1985 and 2001 applying the Vector Error adjustment Model (VECM). The outcome from the investigation uncovered that a positive effect on economic development. Ndayo (2002) examined the "Oddity of Education and Economic Growth in Nigeria" from 1986 and 2000 applying VAR and ECM. The study revealed that the effect of development in instructive capital on the development of genuine Gross Domestic Product (GDP) was reliably negative. Niloy, Emranul, and Osborn (2003) examined the effect of open consumption on economic development for 30 creating nations in 1970s and 1980s using the Ordinary Least Squares (OLS). Result of the study indicates that capital consumption has a critical positive relationship with economic development. At the sectoral level, government venture and consumption on training are the main factors that had critical impact on economic development. Babatunde and Adefabi (2005) explored the long run relationship among training and economic development in Nigeria from 1970 and 2003 applying Johansen co-coordination approach and Vector Error Correction Methodology (VECM). The result shows two distinct channels through which human capital influenced long run economic development in Nigeria. The primary channel was when human capital is an



immediate contribution to the generation work and the second channel was the point at which the human influences the technology parameter. The Johansen Co-joining result sets up a long run connection among instruction and economic development while the Vector Error Co-reconciliation Methodology (VECM) results uncover that human capital positively affects profitability development in Nigeria. Gregoriou and Ghosh (2007) employed the heterogeneous data to investigate the effect of government consumption on economic development in 7 nations crosswise over Europe and Africa from 1970 to 2005. The model used the GMM procedure. The examination that nations with substantial government use tend to encounter higher development, however the impact shifts starting with one nation then onto the next .

3. Methodology

Model Specification

The effect of human capital development on economic growth is analysed in the Human Capital Theory framework as expatiated in the work of Dauda (2010), Oluwalobi and Ogunrinola (2011). They specified their model as:

$$RGDP = f(EDUC, HLTH, BIR, DER) \dots\dots\dots 1$$

The econometric model is expressed as;

$$RGDP = \beta_0 + \beta_1 EDUC + \beta_2 HLTH + \beta_3 BIR + \beta_4 DER + \mu \dots\dots\dots 2$$

Where,

RGDP = Real Gross Domestic Product

EDUC = Educational Expenditure

HLTH = Health Expenditure

BIR = Birth Rate

DER = Death Rate

β_0 = constant parameter

μ = the stochastic term.

Method of Data Analysis

Descriptive and econometrics tools are used in this study. The descriptive tool consists of the use of tables. The econometrics tools include Augmented Dickey Fuller (ADF) test and the Ordinary Least Squares (OLS). The research also employs Granger causality test to ascertain the direction of the variables in the model.

Variable Measurement

Real gross domestic product annual percentage growth rate of GDP at market prices is based on constant local currency (WDI, 2014). Education as an independent variable is measured in terms of the annual expenditure on education in Nigeria (WDI, 2014). Health: current health expenditure per capital in current US dollars includes health care goods and services consumed during each year (WDI, 2014). Birth rate as an independent variable is measured in terms of the annual number of birth ratio of the total population (WDI, 2014). Death rate as an independent variable is measured in terms of the annual number of death ratio of the total population (WDI, 2014)



4. Results

Unit Root Test

The Augmented Dickey-Fuller (ADF) unit root method was employed to check the nature of stationarity of the time series data used in the model. Based on hypothesis principle of null and alternative hypothesis at 5% level of significant, the null hypothesis will be rejected if the ADF value is greater than the critical value at 0.05 level tested at LEVEL and 1ST Differencing with intercept, and TREND and INTERCEPT deterministic measure of the ADF.

Table 1 Unit Root Test

| VARIABLE | Intercept without Trend | | Intercept with Trend | |
|----------|----------------------------|----------------------------|----------------------------|----------------------------|
| | 1 st Difference | 2 nd Difference | 1 st Difference | 2 nd Difference |
| RGDP | -2.574342 | -3.165866** | -2.120109 | -3.095835 |
| EDUC | -5.659264*** | -6.127031*** | -5.639953*** | -6.008653*** |
| DER | -5.493091*** | -7.239095*** | -5.417622*** | -7.092832*** |
| HLTH | -6.162105*** | -9.868852*** | -6.325919*** | -9.744386*** |
| BIR | -8.556003*** | -7.539604*** | -8.589076*** | -7.372687*** |

Note: *, **, *** indicate 10%, 5% and 1% level of significant respectively. Source: Extract from Eiew 10.0

From Table 1 above, the unit root test pass the test analysis of stationarity at 1st difference at either constant, constant and trend respectively. However, since the ADF shows that the data are stationary at 1st difference, we can safely reject the null hypothesis of non-stationarity of time series data at 5% level of significant and accept the alternative that the data used in the model are stationary at 1st difference.

Johansen co-integration Analysis

Table 2: Johansen co-integration

| Hypothesized No. of CE(s) | Eigenvalue | Trace Statistic | 0.05 Critical Value | Prob.** |
|------------------------------|------------|--------------------|------------------------|---------|
| None * | 0.886226 | 167.9978 | 69.81889 | 0.0000 |
| At most 1 * | 0.799169 | 100.6181 | 47.85613 | 0.0000 |
| At most 2 * | 0.588969 | 50.85414 | 29.79707 | 0.0001 |
| At most 3 * | 0.450106 | 23.29243 | 15.49471 | 0.0027 |
| At most 4 * | 0.142162 | 4.753523 | 3.841466 | 0.0292 |

The table above revealed that there is a long run relationship between human capital development and economic growth in Nigeria from 1986 to 2018. The 5 co-integration result shows that at least at 5 variables, human capital development influences economic growth in Nigeria in positive dimension.

OLS Results

Having established that the variables are integrated at levels for all the series, the study proceeded to estimate the parameters of the model using the Ordinary Least Squares (OLS).



Table 3: Regression Results

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| HLTH | 0.147515 | 0.125663 | 1.173901 | 0.2507 |
| EDUC | 0.046359 | 0.050987 | 0.909234 | 0.0713 |
| DER | -0.736540 | 0.174754 | -4.214732 | 0.0003 |
| BIR | 1.231864 | 0.382040 | 3.224436 | 0.0033 |
| C | 19.55473 | 4.683723 | 4.175039 | 0.0003 |
| R-squared | 0.810984 | Mean dependent var | | 9.001546 |
| Adjusted R-squared | 0.782982 | S.D. dependent var | | 2.070791 |
| S.E. of regression | 0.964682 | Akaike info criterion | | 2.908565 |
| Sum squared resid | 25.12653 | Schwarz criterion | | 3.137587 |
| Log likelihood | -41.53704 | Hannan-Quinn criter. | | 2.984479 |
| F-statistic | 28.96131 | Durbin-Watson stat | | 2.218666 |
| Prob(F-statistic) | 0.000000 | | | |

Source: Extract from Eview 10

The measure of the overall goodness of fit shows that the model reasonably fits the data. The adjusted R^2 of 0.81 is reasonably high. This indicates that 81% of the variations in economic growth are explained by the included explanatory variables. While the Durbin-Watson statistics of 2.2 indicates the absence of serial correlation. The F-Statistic of 28.96 exceeds the cut-off point of the F-distribution at the 5 percent level.

The result also revealed that the effect of government capital expenditure on education (EDUC) is positive and statistically insignificant at 5 percent level of significance in determining real growth in Nigerian economy. The positive impact of the variable conforms to the a priori theoretical expectation. It implies that a unit increase in EDUC will result in 0.04 percent increase in real output. However, the insignificant impact is a source of worry. It is a clear reflection of the infrastructural state in most public schools in Nigeria.

The coefficient of birth rate (BIR) measured by the total school enrolment at the primary, secondary and tertiary levels is positively signed and statistically significant at 5percent level of significance. The positive is consistent with the a priori expectation. It suggests that BIR is a crucial factor influencing economic growth in Nigeria as a unit increase in the variable leads to 0.84percent increase in real output in Nigeria.

Similarly, the coefficient of government expenditure on health (HLTH) for the period of 1987 to 2016 had positive impact on real output as expected but is insignificant at 5percent level of significance in explaining the level of the output. The positive impact is in line with the a priori expectation. However, the insignificant effect can be attributed to continuous fluctuation in expenditures in the health sector relative to other sectors in Nigeria over the years. Olajide, Akinlabi and Tijani (2010) noted that the economic downturn since 1970 was as a result of over reliance on the oil sector at the expense of the other subsector of the real sector causing contraction of public spending.

Finally, coefficient of death rate (DER) is positively signed as expected but statistically insignificant at 5percent level of significance. On the average, it means that an increase in



mortality rate to the turn of 100percent is accompanied by 0.36percent increase in RGDP. This confirms the basic thesis of the Harrod-Domar Growth Model. This model predicts that economies converge to their own steady state, with the speed of convergence depending on the marginal productivity of labour and capital. The theory recognised the role of human capital stock. Thus, the increase in a country’s mortality rate decreases the economy’s potential output. Jack (1999) on the hand noted that health is one of the most important assets a human being has. It permits us to fully develop our capacities. If this asset erodes or it is not developed completely, it can cause decreasing man-hours of work. He emphasises that changes in health could affect labour productivity. Labour productivity could also be reduced by the need to care for sick relatives or by reducing years of schooling if parents are chronically ill. Therefore, government expenditure on health promotes the development of human capital.

Granger Causality Test

The Granger causality test was used to determine the direction of causality among the variables understudy.

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|----------------------------------|-----|-------------|--------|
| HLTH does not Granger Cause RGDP | 31 | 1.46167 | 0.2503 |
| RGDP does not Granger Cause HLTH | | 11.2937 | 0.0003 |
| EDUC does not Granger Cause RGDP | 31 | 0.34663 | 0.7103 |
| RGDP does not Granger Cause EDUC | | 7.88561 | 0.0021 |
| DER does not Granger Cause RGDP | 31 | 5.56382 | 0.0097 |
| RGDP does not Granger Cause DER | | 3.25788 | 0.0546 |
| BIR does not Granger Cause RGDP | 31 | 10.1454 | 0.0006 |
| RGDP does not Granger Cause BIR | | 3.88421 | 0.0334 |
| EDUC does not Granger Cause HLTH | 31 | 1.56614 | 0.2279 |
| HLTH does not Granger Cause EDUC | | 20.2529 | 5.E-06 |
| DER does not Granger Cause HLTH | 31 | 10.9994 | 0.0003 |
| HLTH does not Granger Cause DER | | 2.11311 | 0.1411 |
| BIR does not Granger Cause HLTH | 31 | 1.60621 | 0.2199 |
| HLTH does not Granger Cause BIR | | 2.50407 | 0.1013 |
| DER does not Granger Cause EDUC | 31 | 6.19716 | 0.0063 |
| EDUC does not Granger Cause DER | | 3.82120 | 0.0351 |
| BIR does not Granger Cause EDUC | 31 | 1.50898 | 0.2399 |
| EDUC does not Granger Cause BIR | | 3.71426 | 0.0381 |
| BIR does not Granger Cause DER | 31 | 8.77100 | 0.0012 |
| DER does not Granger Cause BIR | | 1.55176 | 0.2309 |

The result shows RGDP granger caused recurrent expenditure on education since the probability value is lower than the cut-off value of 0.05. However, with a probability of 0.8374 which is



well above the cut-off value of 0.05, EDUC clearly does not Granger cause RGDP. Therefore, the conclusion is that there is a one-way causation running from RGDP to EDUC.

The null hypothesis that RGDP does not Granger cause human capital development is accepted while the alternate that BIR does not Granger Cause RGDP is rejected given its probability values of 0.3924 which is substantially below the cut-off value of 0.05. This means there is one-way causation running from BIR to RGDP.

The hypotheses that RGDP does not Granger cause HLTH and that HLTH does not Granger Cause RGDP are accepted since their probability values of 1.E-08 and 0.7816 are substantially above the cut-off value of 0.05. This implies that there is no causation between HLTH and real output.

Finally, the null hypothesis that RGDP does not Granger caused DER is rejected given its probability values of 0.0107 which is substantially below the cut-off value of 0.05. This means there is one-way causation running from RGDP to DER, while, DER does not Granger Cause RGDP are accepted since their probability values of 0.9158 are substantially above the cut-off value of 0.05. This implies that there is no causation between DER and real output.

The results of the OLS revealed that the effect of government recurrent expenditure on education (EDUC) is positive but statistically insignificant at 5percent level of significance in determining real growth in Nigerian economy. The positive impact of the variable conforms to the a priori theoretical expectation. However, the insignificant impact is a source of worry. It is a clear reflection of the infrastructural state in most public schools in Nigeria. This was also found to be insignificant in the work of Oluwalobi and Ogunrinola (2011). Olajide, Akinlabi and Tijani (2010) noted that most buildings of public schools in Nigeria were erected in the late 1970s and early 1980s. They stressed that most primary schools lack the essential infrastructures to enable them function as safe, efficient and effective schools. The physical state of classrooms is very poor, with floors full of holes, roofs and ceilings broken and pertinent facilities in a poor state of repair. In some schools, windows have shutters, but these and doors are often not lockable; so schools lack security. Few schools in the country currently have a perimeter fence or enclosure, making them open to intruders and vandalism as witnessed in Chibok where over 200 school children were adopted by terrorists. Also at the tertiary institution, the level of infrastructural inadequacy needs not to be emphasised. It is a common sight seeing university students standing aside the lecture rooms in order to have a glimpse on what is going on during lecture period (Abiodun, Wahab and Iyiola 2014).

Also, the coefficient of birth rate (BIR) measured by the total school enrolment at the primary, secondary and tertiary level is positively signed and statistically significant at 5percent level of significance. The positive is consistent with the a priori expectation. It suggests that BIR is a crucial factor influencing economic growth in Nigeria as a unit increase in the variable leads to 0.01percent increase in real output in Nigeria.

Similarly, the coefficient of government expenditure on health (HLTH) for the period of 1986 to 2018 had positive impact on real output as expected but is insignificant at 5percent level of significance in explaining the level of the output. The positive impact is in line with the a priori expectation. However, the insignificant effect can be attributed to continuous fluctuation in



expenditures in the health sector relative to other sectors in Nigeria over the years. Olajide, Akinlabi and Tijani (2010) noted that the economic downturn since 1970 was as a result of over reliance on the oil sector at the expense of the other subsector of the real sector causing contraction of public spending.

Finally, coefficient of death rate (DER) is positively signed as expected but statistically insignificant at 5percent level of significance. This confirms the basic thesis of the Harrod-Domar Growth Model. This model predicts that economies converge to their own steady state, with the speed of convergence depending on the marginal productivity of labour and capital. The theory recognised the role of human capital stock. Thus, the increase in a country's mortality rate decreases the economy's potential output. Jack (1999) on the other hand noted that health is a standout amongst the most imperative resources an individual has. If this asset erodes or it is not developed completely, it can cause decreasing man-hours of work. He emphasises that changes in health could affect labour productivity. Labour productivity could also be reduced by the need to care for sick relatives or by reducing years of schooling if parents are chronically ill. Therefore, government expenditure on health promotes the development of human capital.

5. Conclusion and Recommendations

The estimated results revealed that government recurrent expenditure on education (EDUC) and government expenditure on health had positive but statistically insignificant relationship at 5% level of significance on real growth in Nigerian economy. While, Birth rate (BIR) measured by the total school enrolment at the primary, secondary and tertiary level had positive and statistically significant at 5% level of significance in explaining economic growth in Nigeria. On the other hand, death rate (DER) had a positive but statistically insignificant at 5 level of significance on economic growth in Nigeria.

Following the data analysis in the study, it can be concluded that government recurrent expenditure on education (EDUC) and government expenditure on health had positive but statistically insignificant relationship on real growth in Nigerian economy while Birth rate (BIR) measured by the total school enrolment at the primary, secondary and tertiary level had positive and statistically significant effect in explaining economic growth in Nigeria. Further conclusion from the study revealed that death rate (DER) had a negative but statistically insignificant on economic growth in Nigeria.

Based on the findings and conclusion drawn from the study, the following recommendations are made. Government should build capital expenditure on education that can enhance the human capital development framework to encourage successful learning, government should expand its interest in foundation both in the education and different segments, since it would lessen the cost of working together and additionally raise the gains of firms. Government should increase capital expenditure on education that can help to improve on the development of infrastructure to facilitate effective learning; government should increase its investment in infrastructure both in the educational and other sectors, since it would reduce the cost of doing business as well as raise the profitability of firms. Government should encourage the health sector through increased funding and ensure that the resources are properly managed and used for the development of health services to enhance accelerated economic growth of the nation. There is need for further effort by the government to provide healthcares services for the masses



particularly in the rural areas where healthcare have been acknowledged to be inadequate. Finally, efforts should be made by all stakeholders towards reducing the scourge of mortality rate in the country since a rising mortality rate has negative impact on economic growth.

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