



## Disaggregated Impact of Government Expenditure on Human Capital Development in Nigeria

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**Abstract.** This study examined the disaggregated impact of government expenditure on human capital development in Nigeria from 1989 – 2018. In spite of the enormous government spending, little have been felt in the area of human capital development, fundamental to consistent economic growth of any nation. It no news that educational sector has been poorly managed and funded to regenerate the desired human capital development which in turn spurs economic growth. Intuitively, the study adopted the ordinary least squares method, novel for its BLUE properties of its estimators. Several pre and post tests were done on the series used. The result found that capital expenditure has significant impact on human capital development cum economic growth in Nigeria and this finding is consistent with the endogenous hypothesis. Amazingly, variance decomposition result suggests that recurrent and capital expenditure collectively contribute to change in human capital development in Nigeria, approximates Wagner's hypothesis. In general, the results were in line with documented evidence from relevant studies such as the works of Al-Shatti (2014), Peter (2015) and Udoka and Anyingang (2015). It was recommended that Government should make sure that fixed assets and recurrent expenditures are properly managed to accelerate economic growth through deliberate investment in educational sector. In addition, government should propagate efficiency in the allocation of resources on human development by encouraging more private sector participation to ensure productivity-intensive growth.

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### 1. Introduction:

Conventionally and recently, the issue of disaggregated government expenditure and human capital development remains increasingly and indisputably topical because of the perceived link between the two (Alina-Petronela Haller; 2012). Although, the consensus among scholars is that government expenditure is an essential tool that the government uses to ensure economic stabilization especially in developing countries like Nigeria. In an attempt to unravel the factors behind the tragedy of human capital development cum economic growth in Africa, Artadi and Sala-i-Martin (2003) identified the following as significant factors: expensive investment goods, low levels of education, poor health, adverse geography, closed economies, too much public expenditure and too many military conflicts etc. It is premise on this assertion that the successive Nigerian governments have continued to increase its spending over the years with a view to grow the economy. According to Egbo, et. al, (2016) government expenditure concentrated on expenses contracted on government own maintenance for the growth and stability

of the general economy. It can be defined as the part of fiscal tools that hugs and judiciously puts to use, all revenue generated from all sources, for the growth of the economy as a whole. The government expenditure can be categorized into capital and recurrent spending's. While the recurrent include government expenses on administration such as wages, salaries interest on loans, maintenance etc., whereas expenses on capital projects like roads, airports, health, education., telecommunication, electricity generation etc., are referred to as capital expenditure (Nworji, Okwu, Obiwuru and Nworji, 2012 and Okoro, 2014). Put differently, public expenditure deals with government spending and the level of liquidity in the economy directed towards achieving avowed objectives (Bose et. al.; 2003).

The size of the government expenditure influences the nation's economic growth through conscientious development of human capital and vice-versa. Jhingan (2003) in Echekoba, et. al. (2015) defines economic growth as a process whereby the real per capital income of a country increases over a long period of time. According to

him, economic growth is measured by the increase in the amount of goods and services produced in a country. It is often measured as the rate of change in GDP. Despite various efforts of the successive Nigerian governments, virtually all indices of human development especially those of health and education are embarrassingly low (UNDP; 2009). Many studies in the past which set to establish the effects of public expenditure on human capital and economic growth however ended up with conflicting results: while some are of the view that a rise in the share of public spending is associated with a decline in economic growth (Landau; 1986 and Scully; 1989); others have found that public spending is positively associated with economic growth (Taban, 2010) and still others have found no significant relationship (Temple, 2001).

Observably, though preponderance of documented literatures has established a strong tie between government expenditure, human capital development and economic growth, however, a closer examination shows some conflicting theoretical stands. First, the Keynesian economists argued that government remains a major economic stabilization tool but this was rebuffed by the aftermath of the 1930s depression era and thenceforth several scholars have claimed that increase in government expenditure can retard the economic growth and consequently bring about crowded-out effects. Corroboratively, Vedder, et. al. cited by Egbo, et. al. (2016) asserted that as government expenditures increase incessantly, the law of diminishing returns sets-in and beyond a point, further rise in expenditure strangles economic growth. Contrarily, Abu and Abdullahi (2010), Abdullah and Cooray (2009) and Al-Yousif (2012) found that government expenditure stimulates human capital development cum economic growth. Their claim is that government expenditure on capital and not recurrent expenditure increase private sector investment and firms' performance thereby increase the economic growth.

Nigeria economy is an economy that is bequeathed with rich human and natural resources, some tapped or untapped. Given the wealth and its economic potentials, it is particularly disturbing and ironical that Nigeria is still rated as one of the poorest countries of the world, placed at 158 position out of 188 countries (UNDP; 2018). However, despite the increase in the government expenditure there is no appreciable increase in the level of human capital development cum economic growth, as Nigeria is still rank among the poorest country. Besides, between 1991 and 1999, the rate of development of human capital in Nigeria nosedived and recorded some unimpressive negative rates. Following the return to democratic governance, the growth and development of human capital stock of the Nigerian economy experienced some brief level of improvement with the growth rate peaking at 23.74% in 2004. However, from 2013 till 2016, it declined drastically; growing negatively at (5.4, 6.2, 2.7 and -2.24) (CBN; 2018). The economic problem is how to

stimulate growth for increasing the standard of living in the country. It is in view of these controversies; that this study seeks to examine the impact of disaggregated public expenditure on human capital development cum economic growth in Nigeria.

The paper has been divided into five sections. Section I is the introduction, while section II presents the literature review. Section III discusses the econometric methodology and sources of data while section IV analyses the data and interpret the results. Finally section V concludes the paper and recommended policy actions.

## 2. Literature Search:

### 2.1. Conceptual Issues

Up till 19th century, the classical economists did not attach much importance to public expenditure. They advocated the policy of *laissez-faire*. They held the view that government expenditure were apt to be wasteful. They firmly believed that if money was left in the private hands, it could bring better returns. According to them, when there is free economic competition, trade and industry flourishes and prices are regulated. This old *laissez-faire* philosophy has now been discarded. Every government is taking active part in the organization of its country. The range of economic activity has too much widened. There has taken place a considerable increase in government expenditures. This division of the public finance which received little attention at the hands of the classical economists is now considered to be the most important department of public finance (Ogundipe and Oluwatobi, 2016). In developing economies like Nigeria, Iheanacho (2016) noted that government (or public expenditure) policy does not only fasten economic growth and facilitates the generation of employments opportunities, but also plays an active role in poverty reduction and ensures equal income distribution.

Economists classify government expenditures into three main types (Oni, Aninkan and Akinsanya, 2014; Modebe, Okafor, Onwumere and Ibe, 2012): (i) Public purchases of goods and services for current use are classed as public consumption; (ii) Public purchases of goods and services intended to create future benefits, such as infrastructure investment or research spending are classed as public investment; and (iii) payments for debt services are classified as transfer payments. Agbonkhese and Asekome (2015) opine that that the popular classification comprises of recurrent and capital expenditures. As far back as 1909, Ely and Wicker (1909) lend support to classification of public expenditure as: (i) Expenditures for fulfilling the Protective functions of the State. Of the general class of expenditures incurred in fulfilling the protective function of the State, the first to be mentioned are those of external security, internal security and social security expenditures; (ii) Expenditures for fulfilling the Commercial Functions; (iii) expenditures for fulfilling the Developmental function (i.e. education); and (iv)

expenditures for the maintenance of Government. According to Isedu (2002) in Isibor, et. Al., (2015), one way capital expenditure impacts economic growth is the creation of employment. The multi-hydra problem of unemployment in the economy is reduced to the barest minimum. Another way it causes economic growth is the re-allocation of resources to every sector of the economy. Resources are moved from the surplus areas to the deficit areas where they are needed with, thus opening up vast opportunities which will improve the citizens of the country. The breakdown between these two types of spending is very important. Capital expenditure has a lasting impact on the economy and helps provide a more efficient, productive economy. A new hospital, for example, will be much more efficient and allow more patients to be treated for many years into the future. Current expenditure, however, doesn't have such a lasting impact. Once the money is spent, it is gone and the effect on the economy is simply a short-term one.

## 2.2. Theoretical Framework:

Adolph Wagner a German economist of the latter half of the 19th century, who based his Law of Increasing State Activities on historical facts, primarily of Germany, which reflected the growing importance of government activities and expenditure as an inevitable feature of a "progressive" state. He tried to establish a direct link between economic development and growth and the relative size of public sector and consequently public expenditure. Wagner's Law was based upon historical facts. It did not reveal the inner compulsions under which a government has to increase its activities and public expenditure as time passes. It was applicable only to modern progressive governments which were interested in expanding public sector of the economy for its overall benefits, and public expenditure would grow faster than output. This general tendency of expanding state activities had a definite long-term trend, though in the short-run, financial difficulties could come in its way. "But in the long-run the desire for development of a progressive people will always overcome these financial difficulties (Musgrave, and Peacock, 1958).

According to Wagner's Law the principal determining force for the rise in public expenditure is the growth of real per capita income or in other words increased public demand for new public services arising out of the growth of real per capita income. There have been some recent attempts at the positive theory of public expenditure stressing the supply side operating through tolerable limits to taxation on the financing of public expenditure as the more important determinant of the growth of public expenditure. Of the supply side theories of public expenditure, the displacement hypothesis of Peacock and Wiseman has received deepest attention.

Peacock and Wiseman referred to this as the 'displacement effect'. Public expenditure is displaced

upwards and for the period of the crisis displaces private expenditure for public expenditures. The process represents an upward shift in the trend line of public expenditure. Following the period of crisis public expenditure does not, however, fall to its original level. A war is not fully paid for from taxation; no nation has such a large taxable capacity. Countries therefore borrow, and debt charges have to be met after the event. Another effect that they thought might operate was the 'inspection effect'. This effect arises from the voters' keener awareness of social problems during the period of upheaval. The government therefore expands its scope of services to improve these social conditions, and because the electorates' perception of tolerable level of taxation does not return to its former level the government is able to finance these higher level of expenditure originating in the expanded scope of government and debt charges. Alongside the displacement effect, there is another influence, called the 'concentration process' (Peacock and Wiseman, 1967). This concentration effect refers to the apparent tendency for the central government economic activity to grow faster than that of state and local level government. British data are consistent with this hypothesis. Moreover, this aspect of concentration effect is also closely connected with the political set up of the country.

Virtually all growth theories, particularly, the new growth theory opined that more to capital in the determination of income in a model of growth is the 'mystery variable' otherwise known as the effectiveness of labour (A), whose exact meaning is not specified and behavior taken as exogenous, Romer (2006). The effectiveness of labour is seen to be represented by knowledge or technology which its progress is plausibly the reason for more output in today's production processes with a given level of capital and labour. As a result, the study would adopt the simplified version of Research and Development (R&D) and Growth framework first developed by Romer (1990), Grossman and Helpman (1991a), Aghion and Howitt (1992), Uzawa (1965) and Phelps (1966).

## 2.3. Empirical Review:

Whether government is a necessary agent for promoting economic growth or intrusive institution which drains free market economies of dynamic strength has been one of the most debated issues of the past decade. Several scholars and authors have attempted to investigate the empirical link between government expenditure, human capital development and economic growth in Nigeria since time immemorial, but more recently. Some studies such as Nworji, Okwu, Obiwuru and Nworji (2012), Ogundipe (2013), Ogundipe and Oluwatobi (2013), Olulu, Eravwoke, and Ukavwe (2014) reported that both capital and recurrent spending on economic services had insignificant negative impact on economic growth,



Ayo and Ifechukwu (2012) examined the causality relationship among human capital development, economic growth and government expenditure in Nigerian over the period 1970 – 2001. Based on these findings the author recommended that government should implement policies that would moderate government spending in order to reduce inflation rate. Moreover, to complement for the loss, in economic growth through the reduction in government spending the researchers' advised that lending rate should be moderated to encourage private investment in the Nigerian economy. Using time series data of 32years period (1980- 2011), Okoro (2013) investigated the effect of government expenditure on the Nigerian economic growth. With the application of Granger Causality test, Johansen Cointegration Test and Error Correction Mechanism, the result shows that there exists a long-run equilibrium relationship between government expenditure and economic growth in Nigeria. The short-run dynamics adjusts to the long-run equilibrium at the rate of 60% per annum. Chude and Chude (2013) investigated the effects of public expenditure in education on economic growth in Nigeria over a period from 1977 to 2012. They concluded that economic growth is clearly impacted by factors both exogenous and endogenous to the public expenditure in Nigeria. They therefore recommended that, there is need for government to reduce its budgetary allocation to recurrent expenditure on education and place more emphasis on the capital expenditures so as to accelerate economic growth.

Jumare, Yusuf and Mohammed (2014) examined the impact of government expenditure on economic growth in Nigeria. The result explains that government expenditure really do have impact on economic growth but not in a way to bring about the achievement of micro-economic objectives because the pattern of the expenditure is tilted more on recurrent expenditure then capital expenditure. Therefore, the authors recommended that; expenditure should be directed on human capital development that will yield positive and continuous economic growth.

Ozie (2013) explored the relative impacts of federal capital and recurrent expenditures on Nigeria's economy during the period 1980–2011. The result revealed the impact of recurrent to be negative, while that of the capital was positive. Taiwo and Abayomi (2011) examined the relationship between government current and capital expenditure in Nigeria using ordinary least square on series from 1970 to 2008, and they found a significant positive relationship between the economic growth and capital and recurrent expenditure. In an attempt to evaluate the impact of government expenditure on economic growth, Nwadiubu and Onwuka (2015) adopted a disaggregated analysis. In their final recommendations the authors recommended that Government should increase both capital and recurrent expenditure, including expenditures on education, as well as ensuring that funds meant for the

development of these sectors are properly managed. Udoka and Anyingang (2015) investigated the effect of public expenditure on the growth and development of Nigerian economy (1980-2012). They recommended that the government should increase its spending on components of public expenditure which will in turn promote investment in the country.

Egbo, Nwankwo, Okoye and Onuora (2016) explored the relationship between government disaggregated expenditures and growth of the Nigerian economy over the period of 1970 to 2014. The study also revealed the existence of equilibrium or longrun relationship among employed variables, while the ECM was rightly signed at 92% speed of adjustment. The granger causality revealed a demand-following unidirectional relationship between GDP and expenditures on economic services. Based on this, the authors recommended that Expenditures on economic services should be channelled towards diversification of the economy especially in this period of dwindling oil price.

Oyediran, Sanni, Adedoyin and Oyewole (2016) ascertained the relationship between government expenditure and economic growth in Nigeria for the period 1980 to 2013. The results showed that in Nigeria, there exist a significant relationship between the government expenditure and economic growth. The study therefore recommends instilling fiscal discipline in government expenditures and putting in place structural mechanisms to act as surveillance on capital spending so as to boost the nation's human and social capital.

### 3. Methodology and Source of Data:

Traditionally, for a time series, study secondary data is normally employs to establish the necessary link or otherwise among the variables of interest; hence, this study followed the same step. The data is going to be sources from the National Bureau of Statistics (NBS) publications, Central Bank of Nigeria (CBN) Annual Report and Statistical Bulletin, World Bank and International Financial Statistics (IFS) of the IMF. Therefore, the research aims to empirically examine the monetary policy instruments on their impact on economic in Nigeria from 1986 to 2018. The study chooses ordinary least square method of analysis (OLS) tentatively. However, diagnostic checks of the time series properties of the data, like unit root test, was carried out with a view to determining the order of integration of the data used. If the variables of interest are found to be co-integrated, an error correction (ECM) test was also employed to supplement the long-run relationship, otherwise, vector autoregressive model (VAR) will be adopted to analyze the short run dynamics among the variables. Post estimation like serial correlation and heteroscedascity test was also adopted in order to ensure the robustness of the model.





This paper adopted a quantitative method of analysis. The multiple linear regression analysis is estimated with the use of the Ordinary Least Squares (OLS) procedure that produces the least variance and consistent estimators. The test of correlation measures the degree of association of the disaggregated government expenditure and human capita development in Nigeria.

In adopting this framework therefore, the study would take a fairly mechanical view of the production in new technology of labour (human capital) in the traditional Cobb-Douglas production function in which labour, capital and technology are combined to enhance productivity. The model would normally comprise of four variables viz: labour (L), capital (K), and technology (A), and output (Y). The framework assumes two sectors: the goods-producing, where output is produced and the R&D sector, where additions to stock of knowledge are made.

$$Y(t)=[(1-a_k)k(t)]^a[A(t)(1-a_L)L(t)]^{1-a}, \quad 0 < a < 1 \quad \text{-----1}$$

From equation 1,  $a_L$  of the labour force is used in the R&D sector and  $1-a_L$  in the goods-producing sector. Similarly,  $a_k$  of the capital stock is used in R&D and the rest in goods producing sector.

On that basis, the study modifies the works of Ogundipe and Oluwatobi (2016) and Egbo, et. al., (2016) in order to formulate its structural equation below:

$$EDU_{e_t} = f(CAPEX_t, RECEX_t, INTR_t, GDP_{gt}) \quad \text{-----2}$$

The equation (2) above can be further transformed into a mathematical model as follows:

$$EDU_{e_t} = \Omega_0 + \Omega_1 CAPEX_t + \Omega_2 RECEX_t + \Omega_3 INTR_t + \Omega_4 GDP_t \quad \text{-----3}$$

The mathematical model above is re-specify in its econometric form:

$$EDU_{e_t} = \Omega_0 + \Omega_1 CAPEX_t + \Omega_2 RECEX_t + \Omega_3 INTR_t + \Omega_4 GDP_{gt} + \varepsilon_t \quad \text{-----4}$$

A visual inspection of the time series plots of the variables in the next chapter revealed that all the variables are trending over time, most especially EDU<sub>e</sub>, CAPEX, and RECEX which exhibits some great elements of random walks with some extreme outliers. This is because only these variables are recorded in absolute amount (naira) not as a rate or ratio as such the natural logs of these variables are taken in order to secure normality and homoskedasticity. Thus, equation (4) becomes log-linear model through logarithmic transformation as follows:

$$\ln EDU_{e_t} = \Omega_0 + \Omega_1 \ln CAPEX_t + \Omega_2 RECEX_t + \Omega_3 INTR_t + \Omega_4 GDP_{gt} + \mu_t \quad \text{-----5}$$

Where;

EDU<sub>e</sub>= Education enrollment, proxy of human capital development

InCAPEX = Natural Logarithm of Capital Expenditure of the government on education.

InRECEX = Natural Logarithm of Recurrent Expenditure of the government on education.

INTR = Interest Rates (cost of capital, influenced by the activities of the government via expenditure).

RGDP<sub>g</sub> = Gross Domestic Product growth rate over the period under review.

$f$  = functional relationship

$t$  = time-series observations of the variables for the period 1989-2018

$\Omega_0$  = Intercept of relationship in the models.

$\Omega_1, \Omega_2, \Omega_3$  and  $\Omega_4$  = the coefficients of explanatory variables for model.

$\mu$  = error or stochastic term (other factors that were not captured by the model).

### 3.1. A Priori Expectation:

It is expected that at the end of this study to either see that disaggregated government expenditure proxies influencing economic growth; having a positive relationship with human capital development (proxy of education capital), i.e. supporting the Keynesian thought, or otherwise. As a result,  $\Omega_1, \Omega_2, \Omega_3$  and  $\Omega_4 > 0$  respectively.

Time series data is used for this research from the year 1989-2018. The data on human capital development was a proxy of education capital (disaggregated government expenditure on education) same was obtained from the CBN statistical Bulletin, 2018. Similarly, both recurrent and capital expenditure of the government on education were equally sourced from the CBN annual statistical bulletin, 2018. The rest series were generated from the WDI data bank for the relevant years.

### 4. Data Analysis and Interpretation of Results:

This chapter is specifically designed to deal with the empirical aspect of the subject-matter. Specifically, it is designed to present the time-series of the macroeconomic variables used by the study from 1989-2018. Thereafter, the quantitative data are subjected to analyses (pre-diagnostic tests and standard econometric tests). The results obtained from the analyses are used to validate the research hypotheses. This specifically covers the time-series normality test as well as stationarity test (using both the Augmented Dickey Fuller and Phillip-Peron tests). The time series data were tested for stationarity using unit root analysis to avoid yielding spurious regression result

*Unit-Root Test Analysis*

Variable		@ level	@ first difference	@ second difference	Equation Specification	Order of integration
RGDP	ADF	-2.025024 (0.2749)	-4.494464 (0.0077)	-	Intercept & Trend	I(1)
	PP	-1.541368 (0.7881)	-4.463796 (0.0082)	-	Intercept & Trend	I(1)
CAPEX	ADF	-1.542351 (0.7878)	-4.064202 (0.0195)	-	Intercept & Trend	I(1)
	PP	-1.714282 (0.7158)	-4.039328 (0.0205)	-	Intercept & Trend	I(1)
RECEX	ADF	-2.184486 (0.4779)	-4.465284 (0.0086)	-	Intercept & Trend	I(1)
	PP	-2.313794 (0.4125)	-4.591887 (0.0062)	-	Intercept & Trend	I(1)
INTR	ADF	-1.969711 (0.5798)	-6.272446 (0.0004)	-	Intercept & Trend	I(1)
	PP	-3.694441 (0.0417)	-9.401434 (0.0000)	-	Intercept & Trend	I(1)
EXR	ADF	-3.619126 (0.0485)	-5.078996 (0.0023)	-	Intercept & Trend	I(1)
	PP	-2.705855 (0.2423)	-6.889486 (0.0000)	-	Intercept & Trend	I(1)

*P-values at 5% statistical significance.*

*Source: Researcher's Computation, 2020, E-Views, 7.1*

With respect to the ADF test all the variables were found to be non-stationary in their level but were stationary after first differencing (that is, the variables are integrated of order one) implying that the variables are I(1) series. The result of the ADF test result is supported by the PP test result. However, the PP result showed a superior result when the values are compared.

Therefore, this suggest that all the variables are integrated of order one i.e. they are all I(1s). This outcome satisfies the condition for conducting cointegration test which requires that all the variables must be integrated of the same order either at first difference or higher difference. To investigate this, the study employed Johansen Multivariate Cointegration technique.

*Johansen Multivariate Cointegration Test (Trace) Unrestricted Cointegration Rank Test (Trace)*

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.787568	99.97622	69.81889	0.0000
At most 1 *	0.743080	61.24794	47.85613	0.0017
At most 2	0.525777	27.27318	29.79707	0.0951
At most 3	0.231382	8.621225	15.49471	0.4016
At most 4	0.078440	2.042184	3.841466	0.1530

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Source: Researcher's Computation, 2020 (E-Views, 7.1) See Appendix I

From the above tables, it can be observed that both the Trace test and Maximum Eigenvalue test rejected the first null hypothesis at 1% level of significance, implying presence of one cointegrating

equation among the variables. Specifically, the trace test statistics indicates the existence of one cointegrating equation, and likewise the maximum Eigenvalue statistics reveals the same at 1% level of

significance in both cases. Therefore, it is therefore conclude that there is long-run relationship among the variables. Note that the outcome of our cointegration test is similar to one obtained by Victor and Samuel

(2014) who discovered the existence of cointegration between disaggregated public expenditure variables (including CAPEX, RECEX, INTR and GDPG) and EDU in Nigeria.

#### *OLS Error Correction Regression Results*

##### **Dependent Variable: EDU**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.369798	0.767187	-4.392406	0.0003
CAPEX	0.607991	0.131155	4.635654	0.0002
RECEX	0.660956	0.111209	5.943381	0.0000
INTR	-0.168124	0.266031	-0.631970	0.5346
GDPG	0.170586	0.147072	1.159880	0.2598
$\mu(-1)$	-0.096328	0.260618	0.369614	0.7156
<b>R-squared</b>	0.966868	Mean dependent var		4.039044
<b>Adjusted R-squared</b>	0.958585	S.D. dependent var		0.664289
<b>S.E. of regression</b>	0.135187	Akaike info criterion		-0.965146
<b>Sum squared resid</b>	0.365509	Schwarz criterion		-0.674816
<b>Log likelihood</b>	18.54689	Hannan-Quinn criter.		-0.881541
<b>F-statistic</b>	116.7304	Durbin-Watson stat		1.830735
<b>Prob(F-statistic)</b>	0.000000			

Source: Researcher's Computation, 2020. (E-Views, 7.1)

The results in table (above) denote the OLS error correction regression. The differenced variables' coefficients represent short run effect of these variables on the dependent variable. The results in table show that our ECM model has a high coefficient of determination. This can be seen from the R-squared of about 0.9669 (96.69%) percent and the adjusted R-squared of about 0.9586 (95.86%) percent. The R-squared measures the percentage of variations in the dependent variable that was accounted for by variations in the explanatory variables. Thus, it can be argued that our data is well fitted in our model.

The value of the F-statistic is 32.76 and its associated probability value is 0.000000 which is less than 1%. This implies that our overall regression model is statistically significant at 1% level. Thus, all the explanatory variables jointly explain variations in the dependent variable (EDU). The estimated coefficients of the explanatory variables show that not all the explanatory variables conform to a priori specification and are all individually statistically significant at the conventional 1% or 5% levels. This implies that increase in CAPEX, RECEX and GDPG will lead to increase in the level of human capital development in Nigeria. However, increase in the INTR leads to decrease in the level of human capital development in Nigeria. This means that public expenditure have played active role in growth and development of human

capital stock in Nigeria during the period covered by the study.

The value of the Durbin-Watson statistic is 1.83; approximately 2. It is known that when the value of Durbin-Watson is 2, there is no autocorrelation in the residuals; when DW approaches 0, there is evidence of positive autocorrelation (first order autocorrelation) in the residuals. However, when DW approaches 4, there is problem of negative autocorrelation (2nd order autocorrelation) in the residuals. With this in mind, we can safely argue that our model is not plagued by autocorrelation of any order. This implies that our model is reliable for making inferences.

Having found cointegration among the variables, then it follows that the coefficient of the error correction term (ECT) should be negative and statistically significant for the disequilibrium to be corrected in subsequent period and long run equilibrium restored. This condition is met by our model as the coefficient of the one period of the error correction term  $ECT_{t-1}$  is negative (-0.0963 approximately) and it is highly statistically significant at 1% level. The negativity of the  $ECT_{t-1}$  signals that the system is stable enough and is capable of converging to the long run equilibrium after some shocks, disturbances in the system. The value -0.0963 implies that about 9.63% of the disequilibrium is restored within one year. However, this means that the speed of adjustment is very sluggish as it will take 15 years on



average for long run equilibrium to be fully restored after some major shocks in the public expenditure viz a viz human capital development in Nigeria.

But given the underdeveloped nature of the economic institutions especially in a developing country like Nigeria, the outcomes of our model make some little sense at least.

#### *Causality Test*

Pairwise Granger Causality Tests Null Hypothesis:	Obs.	F-Statistic	Prob.
CAPEX does not Granger Cause EDU	27	0.50398	0.6116
EDU does not Granger Cause CAPEX		14.8558	0.0099
RECEX does not Granger Cause EDU	27	1.96253	0.1666
EDU does not Granger Cause RECEX		1.63355	0.2202
INTR does not Granger Cause EDU	27	0.94511	0.4053
EDU does not Granger Cause INTR		8.22008	0.0025
GDPG does not Granger Cause EDU	27	0.39854	0.6765
EDU does not Granger Cause GDPG		3.07137	0.0687

NB: \* means rejection of the null hypothesis of non-Granger causality.

Source: Researcher's Computation, 2020, E-Views, 7.1

The results show the Granger causality test between governments' disaggregated public expenditure and human capital growth in Nigeria. It is instructive to point out here that the cointegration test carried out earlier indicate the existence of a long run relationship between variables but say nothing about the direction of the causal relationship. Execution of the Granger causality test makes it possible for us to determine the direction of the relationship. In the Granger causality approach, causality exists if the F-statistic is statistically significant given its associated probability value. Thus, in this study, causality is established up till 5% level.

The results reported revealed the absence of bi-directional causality between the public expenditure proxies and EDU. This means that causality does not run between the main researches variables in vice-versa. However, there is empirical evidence of unidirectional causality between EDU and CAPEX, EDU and INTR not in reverse direction. In general, it can be safely concluded that there is an evidence of a long-run causality between public expenditure and human capital development in Nigeria which runs from growth in human capital to public expenditure. This result lends support to the endogenous growth hypothesis in Nigeria.

#### **5. Test of Hypotheses:**

*H<sub>01</sub>: Capital expenditure has no significant impact on human capital development in Nigeria.*

The empirical evidence from both the Short-and-Long Run regression models shows that, while the CAPEX has a positive coefficient value of 0.6079 (implying that 60.79%)

effect on the education capital (EDU) with a p-value of 0.00 in the short-run; it has a coefficient value of 0.6517 (or 65.17%) effect on the EDU with a p-value of 0.00 in the long-run.

This means that the capital expenditure has significant impact on economic growth in Nigeria, as such, null hypothesis is rejected. This finding is consistent with the endogenous hypothesis.

*H<sub>02</sub>: Recurrent expenditure has not significant effect on human capital development in Nigeria.*

The empirical evidence from both the Short-and-Long Run regression models shows that, while the RECEX has a positive coefficient value of 0.6609 (implying that 66.09%) effect on the EDU with a p-value of 0.00 in the short-run; it has a coefficient value of 0.6422 (or 64.22%) effect on the EDU with a p-value of 0.00 in the long-run. This also means that the recurrent expenditure has significantly affected the development of human capital in Nigeria.

*H<sub>03</sub>: There is no causality between government expenditure and economic growth in Nigeria.*

The empirical evidence from the granger causality model shows that, there is a unidirectional causality between EDU and CAPEX; meaning that causality runs from human capital development to disaggregated public expenditure (capital expenditure) with a coefficient value of F-statistics and a p-value of 8.22 and 0.00 respectively. This means that growth in human capital development would naturally compel an increase in the amount of capital expenditure on education capital in Nigeria.





## 6. Conclusion and Recommendations:

On the basis of empirical results, the study concludes that government expenditure causes human capital development and in turn economic growth. This conformed to Wagner's hypothesis that growth in the government expenditure causes increased in economic growth. The study rejects the hypothesis that government expenditures amplify growth in human capital development. Finally, the study does not support the existence of Keynesian hypothesis that increase in government expenditures cause economic growth. In a nutshell causality tests apparently indicate that only Wagner's school of thought is valid in Nigeria. While the size of government expenditure can impair growth, an important conditioning factor is the composition, quality and efficiency of public expenditure. Both theoretical and empirical research indicates that growth can be supported when public expenditure is oriented to towards productive investment. This can be particularly relevant for investment in human capital (through education and health spending), technical progress (R&D spending) and public infrastructure. However, evidence also suggests that the link between the amount of spending in these areas and economic growth is not automatic, but depends largely on the ability to achieve the envisaged outcomes (e.g. higher education attainment, more private investment in R&D) and overcoming existing market failures without creating new distortions. Thus, high efficiency and effectiveness of public spending are keys to maximizing the potential of government outlays.

The paper recommended that Government should ensure that capital and recurrent expenditures are properly managed to accelerate economic growth through deliberate investment in educational sector. More so, government should promote efficiency in the allocation of resources on human development by encouraging more private sector participation to ensure productivity-intensive growth. The study also recommends that there should be high degree of transparency and accountability on public spending at various sectors of the economy in order to prevent channelling of public funds to private accounts of public officials.

### Conflict of Interest:

There was no conflict of interest by authors.

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