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Analysis of the Impact of Federal Government Education Expenditure on Human Capital Development in Nigeria: 1990-2015.

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Abstract

This study examined the impact of Federal Government education expenditure on human capital development in Nigeria from 1990 to 2015. We employed a multiple regression model of Ordinary Least Squares (OLS) using secondary data. The stationarity status of the data was examined using Augmented Dickey Fuller (ADF), the long run relationship established using the cointegration test and Error Correction Mechanism (ECM) technique was also employed for the short run relationship. The variables tested include; Human Development Index (HDI) which is our dependent variable, Federal Government Expenditure on Education (FGEE), Federal Government Expenditure on Health (FGEH), and Federal Government Recurrent Expenditure on other Social and community Services (FGRESCS) all serve as our explanatory variables. The results of the regression show that there is positive and significant relationship between FGEE and human capital development was proxied by HDI. The study therefore, recommends that government should see it as a matter of priority to increase the funding in the education sector and try all means possible to block leakages by ensuring that funds are adequately and efficiently utilized in the sector.

Keywords: Human capital, Human capital development, Federal Government Expenditure, Human Development Index, Education, Cointegration.

INTRODUCTION

Recently, special attention has been given to Human Capital Development (HCD) the world over. This is because HCD is considered central to any meaningful national development and globally recognized as one major factor that is responsible for the wealth of nations. In affirming this, Adam Smith (1776) as cited by Oluwatobi and Ogunrinola (2011), believe that human capital refers to the acquired and useful abilities of all the inhabitants or members of the society. Torruam and Abur, (2014) therefore, defined Human capital development as a means of developing skills, knowledge, productivity and inventiveness of people through process of human capital formation.

The concept of human development as introduced by the United Nations Development Programme in 1990 established that the basic objective of human development is to enlarge the range of people's choices to make development more democratic and participatory. These choices are expected to include access to income and employment, education and health, and a clean and safe physical environment.

Education is considered a key index of human development. It is a human right that should be accorded to all human beings basically by reason of being human beings. According to Igbuzor (2006), several international human rights instruments provides for education as a human right. Prior to 1977, Nigeria operated an educational policy that was inherited from Britain at independence but the inability to satisfy the national aspiration rendered it unpopular which led to the introduction of the National Policy on Education (NPE) in 1977 (Okoroma, 2006). Since the 1st publication, the 2nd, 3rd and 4th editions were published in 1981, 1998 and 2004 respectively. The 4th edition was necessitated by some policy innovations and changes as well as the need to update the 3rd edition accordingly (Federal Republic of Nigeria, 2004).The NPE spells out the philosophy and objectives of education and it is on the concurrent legislative list making it possible for federal, states and local governments to formulate policies on issues concerning education. According to Federal Republic of Nigeria (FRN) 2004, all tiers of government have similar levels of educational structures which include; Early childhood- Pre-primary; Basic Education, Senior Secondary; and Tertiary.

The United Nations Educational, Scientific and Cultural Organization (UNESCO), an agency under the United Nations (UN) recommended that every country should allocate 26 percent of their annual budget to the educational sector. Available record however, shows that the Nigerian education sector has consistently received less allocation than advocated by UNESCO. Therefore, making investment in education far below that which can bring appreciable result to human capital development in the country. To this end, this paper is to empirically examine the long-run and short run relationship between federal government education expenditure on human capital development in Nigeria from 1990 to 2015 and to shed more light on their relationship by introducing a model that has Human Development Index (HDI), as the dependent variable and Federal Government Expenditure on Education (FGEE), Federal Government on Expenditure Health (FGEH) and Federal Government Recurrent Expenditure on other Social and Community Services (FGRESCS) as our independent variable. Hence, this paper is subdivided into five sections which are: introduction, Literature Review & theoretical Framework, methodology, presentation of result and analysis and conclusion and recommendations.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK
Conceptual Review

There are diverse views to the concept of human capital. The first views knowledge and skills as embedded in individual (Beach 2009). Thus, human capital can be linked to education (Youndt,

Subramanian and Snell 2004); it is also viewed as knowledge, competency, attitude and behavior embedded in individuals (Rastogi 2002). The second opines that it is part of the accumulation process. This perspective of the human capital concept underscores knowledge and skills acquired through education i.e. primary, secondary, tertiary and vocational education (De la Fuente and Ciccone, 2002). The third view relates to production. In this regard, Romer (1990) and Rosen (1999) refer to human capital as an important factor of productivity and may also be viewed as an integration of various factors such as education, training, wellbeing, health among other factors that affect the value marginal productivity of labour.

The Organisation for Economic Co-operation and Development (OECD, 2001) refers human capital as the stock of competencies, skills, knowledge and personalities attributes embodies in individuals which facilitate their ability to perform labour for the creation of personal, economic and social vale. According to Bloom and Canning (2003), education and health are both direct components of human well-being and a form of human capital that increases an individual's capacities.

The theory of human capital development, emphasizes how education and good health increases the productivity and efficiency of the people. Consequently, education and training are pivotal instruments in the development of the human capital stock of any Nation (Bloom and Canning, 2003).Thus, Awopegba (2002) conceived human capital development "as the process of developing the skills, knowledge and the capabilities of all the people of the society and which are needed in the labour market for the production of goods and services".

The modern approach to human development which got acceptance from various Human Development Report (HDR) published by the UNDP since 1990, presents a profound and comprehensive analysis on the opportunities and challenges facing human capital development, stimulating policy debate and offering policy recommendations for both global and national proceedings. According to UNDP (2015), Human development is a process of enlarging people's choices- as they acquire more capabilities and enjoy more opportunities to use those capabilities. But human development is also the objective, so it is both a process and an outcome. Human development implies that people must influence the process that shapes their lives.

Human development is much more than the rise and fall of national income. According to United Nations Development Programme (UNDP) 2010; "People are the real wealth of the nation" and of course the pathway to national development. Thus, development is about expanding the choices people have, to lead lives that they value. Based on these facts, the Human Development Index (HDI) was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI measures the average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. It is the geometric mean of normalized indices for each of the three basic dimensions of human development UNDP (2015).

Fafunwa (1994) as cited by Aigbedion and Anyanwu (2015) defined education as the aggregate of all the processes through which a child develops abilities and other forms of behaviours which are of positive value to society. Babalola (2003) asserts that the contribution of education to economic growth and development occurs through its ability to increase the productivity of an existing labour force in various ways. Adawo (2011) opined that Nigeria has the fasted growing educational industries in Africa. As at independence in 1960, the country had just two universities. Today, Nigeria has 41 federal universities, 47 state universities and 75 private

universities (National Universities Commission, 2018). This is a pointer to the fact that education has gained significant awareness in the country.

The concept of government expenditure, government spending and public expenditure connote the same thing, hence, may be used interchangeably. The United Nations Educational, Scientific, and Cultural organizations (UNESCO, 2010) defined government expenditure as expenses incurred by public authorities at the central, state and local government levels. This definition implies all expenses incurred by the federal, states, and local governments. UNESCO also went further by dividing government expenditure into two, namely; capital expenditure and recurrent expenditure. Capital expenditure is the investment made in acquiring things or structures that are permanent. These include money spent by the government on building schools, roads, bridges, dams, etc. While recurrent expenditure is the government spending on wages and salaries of civil servants, and general maintenance of public services and property. In line with UNESCO definition, we can conclude that federal government expenditure is the expenses incurred at the centre. In order to suit our study, we therefore limit government expenditure to expenditure at the centre (i.e. federal government expenditure) with special focus on education.

Funding has been identified as one of the major challenges confronting knowledge and skill development in Nigeria. Where there is fund, it is not efficiently allocated. Little wonder why the Human Development Report 1991 was centered on the issues surrounding human capital development financing which was tagged "Financing Human development". It was revealed that "the lack of political commitment, not of financial resources is often the real cause of human neglect". And that "a single powerful idea runs through it – that the potential is enormous for restructuring national budgets and international aid in favour of human development" (UNDP 1991). According to the report, much current spending is misdirected and inefficiently used. That if the priorities are set right, more money will be available for accelerated human progress.

Empirical Review
Several studies have shown that because of its effect on human capital, expenditure on education has a significant positive correlation with growth. Landau (1986) revealed that government expenditure on education seemed to be inefficient at generating actual education. Belgrave and Craigwell (1995) also concluded that government spending on education has a positive effect on economic output in Barbados.

Meanwhile, Omotor (2004) revealed that the trend in education expenditure in Nigeria is unstable which reflects the instability in government earning. As government revenue proved to be the only significant determinant of education expenditure. Diversification of the sources of funding education was recommended. Aigbokhan B., Imahe O. and Ailemen M.I. (2000) established the correlation between public education expenditure and human capital development in Nigeria and noted that insufficient and uncertain budgetary allocations to education have resulted in the deterioration of its impact on human capital development. Education spending as percentages of annual budgets was low and unstable. Harbison (2004) using varied forms of human capital investment, such as school enrolment, human development and economic liberty index evidently pointed out that human capital formation propels growth in per capita income.

Olaniyi and Adam (2003), shows that education and health expenditures have faced lesser cuts than external debt service and defence and allocations to education and health sectors are inadequate when related to the bench marks and the performance of other countries. They affirm that underfunding of education and health sectors has resulted in low literacy rate, low life

expectancy with marginal improvements, high infant mortality rates, low schools enrolment ratio, high level of malnutrition and deteriorating pupil-teacher ratio. The paper thus recommended increase funding to education and health sectors to meet international standards and requirement.

Aigbedion and Anyanwu (2015) revealed in their study that government education expenditure is a catalyst for inclusive growth through human capital development. However, there exist challenges facing government education expenditure in Nigeria which include; inconsistent educational policies, poor funding, human resources and mismanagement of education funds.

Kairo, C.I., Mang, N.J., Okeke, A. and Aondo, D.C. (2017) empirically studied the relationship between human capital development and government expenditure for the period 1990 to 2014. The result shows a positive but insignificant relationship between human capital development and government expenditure. Ehimare, Ogaga-Oghene, Obarisiagbon and Okorie (2014) did an efficiency analysis of the Nigerian government expenditure on human capital development. Their study revealed that there has been significant reduction in the efficiency of government expenditure between 1980 and 2011.Hence, the poor quality of output experienced in Nigerian educational sector.

This paper thus, empirically examine the long-run and short run relationship between federal government education expenditure on human capital development in Nigeria from 1990 to 2015 and hope to shed more light on their relationship by introducing a model that has Human Development Index (HDI), as the dependent variable and Federal Government Expenditure on Education (FGEE), Federal Government on Expenditure Health (FGEH) and Federal Government Recurrent Expenditure on other Social and Community Services (FGRESCS) as our independent variable.

Theoretical Framework

Nafukho, Hairston and Brooks (2004) citing Mincer 1962; Becker 1993 stated that in the 1950s the main factors of production consisted of physical capital, labour, land and management. The gap known as 'residual factor' was identified as human capital (Schultz 1961). The fundamental principle underpinning human capital theory therefore, is the belief that people's learning capacities are comparable value to other resources involved in the production of goods and services (Lucas, 1990). Adamu,(2003) thus viewed human capital as a factor influencing labour productivity because it facilitates the absorption of new technology, increases the rate of innovativeness and promotes efficient management. Consequently, for high labour productivity, an integral part of technological progress is investment in human capital and thus is termed endogenous factor because accumulation of physical capital is enhanced by the knowledge, skills, attitudes and health status of the people who partake in such exercise.

In line with Judson, (2002) cost based method, expenditure on education is used to capture the quality of education. According to Judson (2002), many models have been developed to incorporate the special nature of human capital into the production function which generated different predictions about the interactions of levels, growth and returns to human and physical capitals. Among the numerous available studies, the Augmented Solow Model by Mankiw, Romer and Weil (1992) appears to be most suitable for this study. The justification for the inclusion of human capital in the production model is the fact of non-homogeneity of labour in the production process either within a nation or across different economies due to their possession of different levels of education and skills. This modification facilitates the suitability

and hence, the adaptation of this model for the Nigerian context as adapted by Oluwatobi and Ogunrinola (2011).

METHODOLOGY
Model Specification
The model for this study is drawn from the augmented Solow growth model as modified by Mankiw, Romer and Weil (1992), which is therefore specified as:

$$Y = AK^{\alpha}(hL)^{\beta} \qquad (3.1)$$

Where; Y = Output level; K = Stock of physical capital; h = Level of Human Capital; L = Labour (measured by number of workers); A =Level of total Factor Productivity. α = Elasticity of capital input with respect to output. β = Elasticity of Labour input with respect to output. Econometrically, the model is specified as thus;

$$Y = AK^{\alpha}(hL)^{\beta} \mu \qquad (3.2)$$

μ = Error term.
When transformed into a log-linear form, it becomes;

$$logY = \alpha_0 + \alpha logK + \beta loghL + v \qquad (3.3)$$

Where; α_0 = log A and V = log μ

To suit the Nigerian context and the relevance of this study, the model is modified to accommodate other variables. These include FGEE, FGEH, and FGRESCS. These variables are incorporated to capture government's investment in human capital development proxied by HDI since the study is to examine the impact of government expenditure on human capital development. Hence we have;

HDI = f(FGEE, FGEH, FGRESCS)

$$HDI_t = \alpha_0 + \beta_1 FGEE_t + \beta_2 FGEH_t + \beta_3 FGRESCS_t + \mu_t \qquad (3.4)$$

Where; HDI = Human Development Index; FGEE = Federal Government Expenditure on Education, FGEH = Federal Government Expenditure on Health, FGRESCS = Federal Government Recurrent Expenditure on other Social and Community Services, α_0, β_1, β_2, and β_3, are parameters to be estimated while μ_t=error term. Taking the natural log of equation 3.4, we have;

$$logHDI_t = \alpha_0 + \beta_1 logFGEE_t + \beta_2 logFGEH_t + \beta_3 logFGRESCS_t + \mu_t \qquad (3.5)$$

From equation 3.5, the Error Correction model is formulated thus;

$$\Delta logHDI_t = \beta_0 + \sum_{g=1}^{k} \beta_{1i} \Delta logHDI_{t-i} + \sum_{h=1}^{l} \beta_{2i} \Delta logFGEE_{t-i} + \sum_{i=1}^{m} \beta_{3i} \Delta logFGEH_{t-i}$$

$$+ \sum_{j=0}^{n} \alpha_{4i} \Delta logFGRESCS_{t-j} + \beta ECM_{t-1} + \varepsilon_t \qquad (3.6)$$

The ECM reconciles the short run and the long run behavior of the variables. Thus, the over parameterized model adjust the estimation until the ECM becomes negative. The ECM has a negative coefficient which shows the statistical significance of the equation in terms of its associated t-value and probability value.

Estimation Techniques
To achieve the objective of this study however, annual time series data is used and the Ordinary Least Square (OLS) is adopted as the estimation technique. The computations involving the use of the above statistical technique is facilitated by the application of Econometrics views (E-

Views), Version 8 software. The variables are examined in logarithmic forms to help in achieving linearity. Due to the fact that time series data is employed, Unit root test (URT) is conducted to test for stationarity of the data. This is done by using the Augmented Dickey-Fuller (ADF) test as the starting point so as to assess the order of integration.

The application of the co-integration theory incorporating the Error Correction Mechanism (ECM) is employed. The process examines the time series characteristics and also generate long run equilibrium relationships concurrently. The presence of co-integration means that long-run equilibrium relationship exists among the variables.

PRESENTATION OF RESULT AND ANALYSIS
Stationarity (Unit Root) Tests

Table 1: Stationarity (Unit Root) Test

Variables	ADF Statistics	5% Critical Value	Order of Integration	Prob.
HDI	-4.472361	-2.991878	I(1)	0.0018
FGEE	-4.557335	-3.029970	I(2)	0.0022
FGEH	-5.908900	-2.998064	I(1)	0.0001
FGRESCS	-5.055419	-2.991878	I(1)	0.0005

Source: Author's computation using E-views software 8.0

Many classical statistical tests and intervals including the Ordinary Least Square (OLS) depends on normality assumptions. In order to transform the data to be suitable for the model, stationarity test was conducted using the Augmented Dickey-Fuller (ADF) test. The outcomes of the unit root test are found in Table 1. The result shows that we can reject the presence of unit root in HDI, FGEH and FGRESCS in their first difference while that of FGEE is rejected in its second difference.

Co-integration Test
Table 2: Unrestricted Cointegration Rank Test (Trace/Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.875603	75.68132	47.85613	0.0000	50.02274	27.58434	0.0000
At most 1	0.449772	25.65858	29.79707	0.1392	14.33815	21.13162	0.3379
At most 2	0.375667	11.32043	15.49471	0.1925	11.30572	14.26460	0.1396
At most 3	0.000613	0.014717	3.841466	0.9033	0.014717	3.841466	0.9033

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level

Source: Author's computation using E-views software 8.0

This paper analyzes the cointregration of the variables to establish if there exists any long run relationship among the variables using Unrestricted Cointegration Rank test. The result is presented in Table 2. The cointegration test of the variables confirms the existence of long run equilibrium relationship among the variables. The Trace test reveal the existence of one cointegrating equation at 5 percent level of significance and the maximum Eigen value test also confirm the result.

Discussion of Result

Table 3. Long run Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.025996	0.006109	4.255489	0.0004
DLOG(FGEE,2)	0.026844	0.008172	3.284960	0.0037
DLOG(FGEH)	-0.013703	0.013082	-1.047479	0.3074
DLOG(FGRESCS)	-0.014444	0.005058	-2.855881	0.0098
R-squared	0.484455	Durbin-Watson stat		1.695457
Adjusted R-squared	0.407123			
F-statistic	6.264636			
Prob(F-statistic)	0.003575			

Source: Author's computation using E-views software 8.0

The long-run regression results show that FGEE has a positive relationship with HDI while FGEH and FGRESCS have negative relationship with HDI. The result also show that a percentage change in FGEE will on the average lead to about 2.7 percentage increase in HDI while holding FGEH and FGRESCS constant. A percentage change in FGEH will on the average lead to 1.4 percentage decrease in HDI while holding FGEE and FGRESCS constant. And a percentage change in FGRESCS will on the average lead to 1.4 percentage decrease in HDI while holding FGEE and FGEH constant. 0.026 is the intercept which is the value of HDI when FGEE, FGEH and FGRESCS are equal to zero.

FGEE can be said to be statistically significant considering the fact that t_{cal} (3.285) is $>T_{tab}$ (2.056). Also, FGRESCS is statistically significant considering the fact that t_{cal} (-2.856) is $>T_{tab}$ (2.056). However, FGEH is statistically insignificant because t_{cal} (-1.0475) is $<t_{tab}$ (2,056).

The coefficient of determination (R^2) shows that 48 percentage of the total variability in HDI is explained by the estimated regression while about 52 percentage is left unexplained. This gives no cause for alarm especially because this study is for policy making and not for forecasting. More so, the F_{cal} (6.265) is $>F_{tab}$ (3.44), it shows that the entire model is statistically significant and a significant determinant of HDI. The DW (1.6955) shows absence of autocorrelation, positive or negative.

Table 4: Short Run Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.025088	0.005867	4.276096	0.0004
DLOG(FGEE,2)	0.022375	0.008250	2.712246	0.0138
DLOG(FGEH)	-0.007262	0.013078	-0.555315	0.5852
DLOG(FGRESCS)	-0.012537	0.004967	-2.524099	0.0207
ECM(-1)	-0.372905	0.220296	-1.692745	0.1068
R-squared	0.552016	Durbin-Watson stat		1.574556
Adjusted R-squared	0.457703			
F-statistic	5.853047			
Prob(F-statistic)	0.003037			

Source: Author's computation using E-views software 8.0

Looking at the ECM i.e the Short Run Regression Results on Table 4, the size of the coefficient on the Error Correction Mechanism (ECM) denotes that 37 percentage of the disequilibrium caused previous years shock converges back to the long run equilibrium in the current year. The

negative sign of the coefficient of the error correction term ECM (-1) shows the statistical significance of the equation in terms of its associated t-value and probability value.

The results further show that FGEE has a positive relationship with human capital development in Nigeria, while FGEH and FGRESCS have negative relationships with Human capital development in Nigeria. The result also show that a percentage change in FGEE will on the average lead to 2.2 percentage increase in human capital development in Nigeria. The results however, show that an increase in FGEH will on the average lead to a 0.73 percent decrease in human capital development in Nigeria. Also, an increase in FGRESCS will on the average cause a 1.3 percent decrease in human capital development in Nigeria.

The coefficient of determination (R^2) is 0.55 which indicates that about 55 percent of the systematic variation in human development index is accounted for by the variables taken together. The F-value of 5.853047 is significant at 1% critical value of 4.82 considering the fact that F_{cal} is greater than F_{tab}.

CONCLUSION AND RECOMMENDATIONS.

Based on the data gathered, presented and analyzed, the following major findings reveal that; Investment in education by the federal government through spending contributes positively to HCD. Also, Federal government expenditure on education has significant relationship with human capital development in Nigeria. The results of the empirical tests revealed that there exist significant and positive relationship between federal government education expenditure and human capital development in Nigeria.

As a result, this study recommends;

i. That the federal government should increase budgetary allocation to the education sector at their various levels and capacities. And as a matter of priority implement the minimum United Nations Education Scientific and Cultural Organization (UNESCO)'s recommendation of 26% of total budget to education. Donor agencies like the World Bank, UNESCO, UNDP etc. should be encouraged to support the funding of Education in Nigeria. This can be achieved only if the government plays her part in ensuring proper and adequate utilization of resources.

ii. Private participation in the provision of quality but affordable education should be encouraged so as not to deny the citizens the right to education.

iii. That government should also device a means for proper monitoring of disbursed funds to ensure they are properly and efficiently utilized.

iv. Government should recognize the need to run good governance that will attract foreign investments and also capable of attracting Nigerians back to the country where they can live, invest and fully participate.

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APPENDIX I

Table 5. Data of HDI, FGEE, FGEH and FGRESCS

YEAR	HDI	FGEE (₦ Billion)	FGEH (₦ Billion)	FGESCS (₦ Billion)
1990	0.322	2.7317	0.757	0.49
1991	0.328	1.5491	0.7576	0.8
1992	0.348	0.6741	0.338	0.89
1993	0.389	10.443	4.2229	1.91
1994	0.384	9.7857	3.051	0.61
1995	0.402	13.0574	5.0452	0.75
1996	0.4	14.7158	4.6795	1.47
1997	0.4	18.658	6.5138	3.32
1998	0.4	26.383	13.0472	3.11
1999	0.4	52.1266	24.0268	11.12
2000	0.4	68.4892	24.0856	11.61
2001	0.4	59.74	44.648	15.23
2002	0.4	89.745	53.228	31.03
2003	0.445	79.48	39.67	4.56
2004	0.463	85.63	52.4	23.66
2005	0.466	114.7	77.46	13.19
2006	0.477	151.72	94.45	12.9
2007	0.481	197.58	178.81	23.99
2008	0.487	212.78	195.42	70.73
2009	0.492	180.52	142.7	126.87
2010	0.5	258.7	134.1	281
2011	0.507	371.2	271.3	217.84
2012	0.514	396	242.9	243.76
2013	0.521	425.82	212.39	273.66
2014	0.525	384.55	236.68	235.03
2015	0.527	355.59	288.12	224.71

Sources: *CBN, Annual Reports and Financial Statements (various issues).*
          CBN, Statistical Bulletin (2015).
          UNDP, Human Development Report (various issues).