HUMAN RESOURCE DEVELOPMENT EXPENDITURE AND ECONOMIC GROWTH IN NIGERIA: AN APPLICATION OF COINTEGRATION ANALYSIS

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Abstract

The paper investigates the Impact of Human Resource Development Expenditures on Economic Growth in Nigeria using a time series data for the period 1990-2011.The study found that human capital expenditure has positive impact on economic growth. The study concluded Nigeria is confronted with problems that could limit the capacity of expansion in human capital development to stimulate growth such as under-employment, low absorptive capacity, and shortage of professionals, regional imbalances and brain-drain. The study recommended that government and private sectors should partner by mobilizing resources to furnish tertiary institutions and equip them with adequate facilities in order to improve the quality of education to enhance human capital development for sustainable economic growth.

Keywords: Public Expenditure, Economic Growth, Co integration, Causality, Development.

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1 INTRODUCTION

In all countries of the world, education is recognized as the cornerstone for sustainable human resource development. It is a fulcrum around which the quick development of economic, political, sociological and human resources of any country resolves. In fact, the (Nigeria's) National Policy on Education (1981:6) indicates that education is the greatest investment that the nation can make for the quick development of its economic, political and social system. Having recognized education as "an instrument per-excellence for effective national development" as well as "a dynamic instrument of change," it is also the basis for the full promotion and improvement of the wellbeing of it citizens. Education empowers individual by improving their living standard. It is the starting point for citizen's advancement in different fields of human endeavor.

The role of education as human resource development in an economy has been underscored in many studies. Education, as a key component of human capital formation is recognized as being vital in increasing the productive capacity of people. Education, especially at the higher level, contributes directly to economic growth by making individual workers more productive and indirectly by leading to the creation of knowledge, ideas, and technological innovation [11].

Nigeria today is experiencing a critical manpower development handicap occasioned by the fact that the number of prospective students seeking for admission into tertiary institutions is projected at over 1.2 million (JAMB 2001). But only about 20% of this numbers actually secure admission to such institutions. The unfortunate expectation of both parents and students are apprehensive of any new initiative in the management of tertiary institution to mean introduction of tuition fees. Inspite of the introduction of tuition fees, there still exist difficulties on the part of tertiary institutions management to meet there internal fund generation quota despite the huge government expenditure on tertiary education.

The theoretical relationship between government expenditure and economic growth is well-documented in the literature and therefore it will only be briefly discussed here. There are two major divergent theories in economics concerning the relationship between government expenditure and economic growth. While Keynesian macroeconomic theory has generally assumed that increased government expenditure tends to lead to high aggregate demand and in turn, rapid economic growth, Wagnerian theory, however, leans toward the opposite view.

The latter contends that an increase in national income causes more government expenditure. A number of studies focused on the relation between government expenditure and economic growth. Nevertheless, to pertain to the topic of this paper, we will only focus on the literatures that probe the relationship. Among the literatures, some of the studies are the case studies which focus on specific country while others target on the cross-countries research by studying panel dataset. The results varied from one study to another.

[12] studied the impact of government spending and economic growth in Nigeria and the results obtained based on regressions used and panel techniques suggested that government spending is positively related with economic growth in the European Union countries. [13] target on the causal relationship between government expenditure and economic growth in Nigeria by using the time series data from 1980 to 2010., they found in this study that total expenditures does not cause the growth of GDP, which is incompatible with the Keynesian's theory, but the growth of GDP does cause the increase in total public expenditures which is compatible with Wagner's law. [4] investigated the long run relationship between education expenditure and economic growth in Nigeria between 1970 and 2003 through the application of Johansen cointegration technique and vector error correction methodology. Their findings reveal that the Johansen cointegration result establishes a long run relationship between education and economic growth. [1], investigated the causal relationship between public expenditures and economic growth covering the time series data 1974-2002. They also found mixed evidence on their empirical results, i.e., some results support Wagner's Law while others verify Keynesian's theory. [2] in their study the government expenditures and economic growth in Nigeria, concluded that the government has played an important role in economic development of the country. [3], carried out a study titled "Human Capital Expenditure and Economic Growth: A Disaggregated Analysis for Developing Countries" this study found out that the share of government capital expenditure in GDP is positively and significantly correlated with economic growth, but current expenditure is insignificant.

This study is limited to public expenditure on tertiary institutions in Nigeria during the period 1990-2011. The purpose of this paper is to determine the relationship between government expenditure on tertiary education and economic growth. To examine the impact of public expenditure on tertiary education and economic growth in Nigeria.

2 METHODOLOGY

The model is estimated using annual data from 1983-2009. The technique of cointegration and Error Correction Model (ECM) is employed. In order to carry out this research effectively, it is essential to first check the presence of unit root (non-stationarity). If unit root exist in any variable, then the corresponding series is considered to be non- stationary. The technique applied in this paper is briefly discussed as follows:

2.1 Unit Root Test Augmented Dickey Fuller (ADF)

Unit root test is used to check weather data is stationary or non-stationary. A process is said to be stationary if its probability distribution remains unchanged as time proceeds and we can say that data generation process does not changed. In this paper, we are going to use the Augmented Dickey Fuller (ADF) test. The general form of ADF test can be written at level and first difference form as follows:

$$\Delta y_t = \beta y_{t-1} + \sum_{i=1}^{k-1} \theta_i \Delta y_{t-i} + \varepsilon_t \qquad (1)$$

where Δ is the first difference operator, β is the coefficient of the previous observation, y_{t-1} is the immediate previous observation, Δy_{t-i} is the differenced lagged term, k is the number of lags, θ_i is the parameter to be determined and ε_t is white noise. Therefore, we can draw our null hypothesis (H_0) against the alternative hypothesis (H_1) for this model as:

H_0: $\beta = 0$ unit root exist against H_1: $\beta < 0$ no unit root existFrom the estimation of equation (2) above, the coefficient β is tested based on the t-statistics given as:

$t_\infty = \frac{\hat{\beta}}{se(\hat{\beta})}$ where $\hat{\beta}$ is the estimate of β and $se(\hat{\beta})$ is the coefficient of the standard error.

2.2 Cointegration Analysis

Cointegration could be seen as when economic variables share a common stochastic trend and their first differences are stationary. Hence, they are said to be cointegrated. This analysis helps to identify the long-run economic relationships between two or more variables. The Johansen method for cointegration analysis is based on the works of Johansen (1988, 1991) and Johansen and Juselius (1990, 1992). The basis for the analysis is a vector autoregressive model (VAR) with dimension *p*, equal to the number of variables in the model. The VAR model can be written as

$$X_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \cdots + \beta_k X_{t-k} + \varepsilon_t \qquad (1)$$

Where; k is the number of lags in the model and $X_t$is a variable vector defined as X_t =$[X_{1t} \cdots X_{pt}]$.′

The error term ε_t is assumed to be independently and identically normally distributed with mean zero and covariance matrix □. The VAR model can be rewritten in its vector error correction form as;

$$\Delta X_t = \beta_0 + \Pi X_{t-1} + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \cdots + \Gamma_{k-1} \Delta X_{t-k+1} + \varepsilon_t \quad (2)$$

Where $\Gamma_i = -\sum_{j=i+1}^{k} \beta_j$ and $\Pi = \sum_{i=1}^{k} \beta_i - I_n$.

Therefore, the variable vector

$$X_t = [X_t \;\; Y_t]' \text{ and } \Delta X_t = \beta_0 + \Pi X_{t-1} + \varepsilon_t. \quad (3)$$

The Johansen analysis is concerned with the matrix Π. In a cointegrated model, the Π-matrix has reduced rank and can be decomposed into two matrices, α and β, as $\Pi = \alpha\beta'$. Hence, both α and β have the dimension (p×r), where r is the number of cointegrated vectors in the model. Therefore the matrix β is considered to be a matrix of long-run cointegration relations and the elements in the matrix α are adjustment coefficients, which is used to determine the speed of adjustment back to equilibrium after a deviation from the long-run relation. The number of cointegrated vectors, *r*, is also equal to the rank of Π. If *r*(Π) = 2 in equation (3), Π has full rank and the variables in X_t are stationary. If *r*(Π) = 0, X_t is non-stationary, but there is no cointegration relation between the variables, and finally, if *r*(Π) = 1, X_t is non-stationary and there exists one cointegration relation among the variables.

Testing for the number of cointegration relations and obtaining estimates of α and β are done with the Johansen maximum likelihood procedure and Johansen's trace statistic. After establishing the presence of cointegration in the model and the number of cointegration vectors, the interest turns to testing hypotheses regarding the parameters in the matrices α and β. This structural hypotheses can be tested with the LR test proposed by Johansen (1991) and Johansen and Juselius (1990, 1992).

2.3 Model Specification

In an attempt to determine the impact of human capital development for economic growth in Nigeria, it is ideal to develop a model to justify the relationship that exists between the variables. Therefore, the model for this study is theoretically stated as:

$Y = \beta_0+\beta_1X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$. Where; Y = real gross domestic product growth rate; X_1 = capital expenditure on education; X_2= recurrent expenditure on education; X_3= tertiary education enrolment; X_4 = number of graduates in tertiary institutions ; β_o= Intercept of the equation; μ = Stochastic error term

2.4 Data Collection

The study depend solely on secondary sources, including publications of the Education Sector Analysis (ESA); the Central Bank of Nigeria (CBN); Federal Officer of Statistics (FOS); National Youth Service Corp (NYSC) annual report, Federal Ministry of Education (FME). Additional information was obtained from the Federal Republic of Nigeria Appropriation Act of various years, and past issues of the annual details of approved capital and recurrent expenditures on education and Nigeria Social and Economic Research (NISER) library.

3 Results and Discussions

3.1 Unit Root Tests

The results regarding the order of integration of the series have been determined by Augmented Dickey Fuller (ADF) test. The calculated t-values from ADF tests on each variable are reported in Table.1.

Table 1: Results of Unit Roots Tests using Augmented Dickey Fuller (ADF)

Variable	ADF Statistics with Constant but no linear trend	ADF-Test Statistics with Constant	Critical Value at 5%	Order of Integration
RGDPG	-10.6166*	-3.1031	-2.101	I(1)
CE	-5.7575*	-3.0213	-2.114	I(1)
RE	-5.2837*	-4.4060	-2.0224	I(1)
GRAD	-4.2192*	-3.5501	-2.0121	I(1)
TERE	-5.4292*	-4.1001	-2.0190	I(1)

*Note *significant at 5 percent level*

The Augmented Dickey Fuller (ADF) results demonstrated in Table 1 above indicate that the series are all integrated of order one i.e I(1).

3.2 Cointegration Test

Recall that all the variables are I(1), as evident from the unit root

tests. In order to capture the extent of cointegration among the variables, the multivariate Johansen based cointegration methodology were conducted and the results are shown in Table 2 below

Table 2 Johansen Cointegration Test

Hypothesized No of CE(s)	Eigenvalue	Trace-Stat.	5 %	1%
None**	0.6683	60.3818	50.01	52.45
At most**	0.4852	42.4746	28.48	35.55
At most**	0.4048	23.5436	15.43	12.14
At most	0.271	4.5601	5.66	6.65

Note: (**) denotes rejection of the hypothesis at 5% (1%) significance level LR test indicates 3cointegrating equations at 5% significance level.

Table 2 indicates that the dependent variable RGDP is cointegrated with CE, RE, TERE and GRAD. The results indicate that the dependent and independent variables are both cointegrated and have long run relationship with one another.

3.3 Regression Results

The ECM results are demonstrated in Table 4 below:

Table 4.3: Regression Results

Variables	Estimated Coefficient	t-Statistic	Probability
DL(GCE(-1),1)	1.3244	4.2805	0.0001
DL(GRE(-2),1)	2.3429	2.5680	0.0123
DL(GRAD(-1),1)	1.3824	0.1986	0.0215
DLTERE	1.3684	0.2983	0.0012
ECM(-1)	-0.6715	-3.7544	0.0022
C	5.6806	0.2145	0.6323

R-Squared= 0.8074
Adjusted R- Squared= 0.7689
F.Statistic = 21.07
D.W. = 1.99

The results in Table 3 indicates that the coefficient of CE, RE, TERE and GRAD has positive and statistically significant effect on economic growth in Nigeria. The result of Error Correction Model (ECM) has negative sign and is statistically significant. Therefore, the ECM is able to correct any deviations in the relationship between real GDP growth rate and the explanatory variables. This is an indication that there exist long run relationship between real GDP growth rate and the explanatory variables and its takes more years to attain equilibrium. The adjusted R^2 is 77 % which imply that over 70 percent of the variations in real GDP growth can be explained by the three variables taken together. The remaining 23 percent variations can be attributed to other forces outside the model. These results show a goodness of fit of the regression. The F-statistics of 21.07 indicates that the explanatory variables are important determinants of the GDP growth rate in Nigeria. The Durbin-Watson statistics of 1.99 rules out auto-correlation.

3.4 Economic Implication

In order to achieve maximum economic growth, government expenditure on education needs to be better prioritized. Investing in education offers high return in terms of economic growth. This means that increasing in expenditure on education services do not only have a large impact on poverty per naira spent, but also produce greatest growth in human productivity. This is because as more people get good education, they will increase their productivity at work. This implies that shifting resources from low-productivity sectors, such as general administration to education, will generate economic growth in the country.

4 CONCLUSION

The study concluded that human capital development contributes positively to economic growth in Nigeria. However, Nigeria is confronted by most of the problems that could limit the capacity of expansion in human capital development to stimulate growth such as under-employment, low

absorptive capacity, and shortage of professionals, regional imbalances and brain-drain. This means that if Nigeria is to achieve sustainable economic growth rate, it is of utmost importance for the country to reposition herself as a potent force through the quality of her products from the tertiary school systems as well as making her manpower relevant in the highly competitive and globalised economy through a structured and strategic planning of her educational institutions.

5 RECOMMENDATIONS

Based on the results obtained in this study, it is recommended that government and private sectors should join hands by mobilizing resources to furnish tertiary institutions and equip them with adequate facilities, libraries, laboratory equipments, computers and modern instructional materials in order to improve the quality of education and enhance human capital development, labor productivity and ensure sustainable growth and development. Graduates drop-out rate from tertiary education need to be addressed, through effective synergy between post-primary and technical institutions to be able to address the technical manpower needs of the economy. Government should continue to provide enabling environment by ensuring macroeconomic stability that will encourage increased investment in human capital by individuals and the private sector. Regular closure of tertiary institutions due to strikes, cult activities, and excesses of student unions, etc. should be addressed by the relevant authorities.

REFERENCE

[1] B. Aigbokhan, O. Imahe, and M. I. Ailemen, 'Education Expenditure and Human Capital Development in Nigeria: Any Correlation so far', *Research Paper*, Ambrose Ali University, (2007).

[2] P. O. Allege and I. O. Ogunrinola ,Human Capital Development and Economic Growth in Nigeria. Paper Delivered at the International Conference on Human Development at Covenant University, Ota Ogun State Nigeria, (2005).

[3] S. Appleton and F. Teal,'Human Capital expenditure and Economic growth', *Economic Research Paper*, No. 39. (1998).

[4] M.A. Babatunde and R.A. Adefabi,"Long Run between Education and Economic Growth in Nigeria: Evidence from the Johansen's Cointegration Approach".Paper presented at the Regional Conference on Education in West Africa: Constraints and Opportunities, Dakar, Senegal, November 1st -2nd, 2005, Cornell University/ CREA/ Ministerede l'Education du Senegal, (2005).

[5] Central Bank of Nigeria, '*Statistical Bulletin*' Vol.15 Central Bank of Nigeria '*Annual Report and Statement of Accounts*', Various Issues, (2007).

[6] Federal Ministry of Education, *Statistics of Education*, Various Issues, (2009).

[7] Federal Republic of Nigeria, National *Policy on Education*, 4th Edition. Federal Office of Statistics, *Annual Abstract of Statistics*, Lagos, (2004).

[8] S. Johansen and K. Juselius,"Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money". *Oxford Bulletin of Economics and Statistics* .Vol.52 (2), (1990).

[9] B.V. Leeuwen, *Human Capital and Economic Growth in India, Indonesia, and Japan; A Qualitative Analysis* 1890-2000, Doctoral Thesis, Utrecht University, (2007).

[10] T.M. Yesufu, The Human Factor in National Development, Spectrum, Ibadan, pp. 310 – 330, (2000).

[11] N. Larocque, Comment on " Intersectoral interfaces in Higher Education Development: Private and Public in Sync? " by Daniel C. Levy. In.: *Higher Educatioand Development*.Annual World Bank Conference on Development Economics-Regional, Justin Yifu Lin and Pleskovic B. (ed.), The World Bnk, Washington,D.C (2008).

[12] A; S. Adedeji Rasheed; and M. Morrison, Eds. The Human Dimension in Africa's Persistent Economic Crisis. United Nation Economic Commission for Africa. Hans Zell Publisher, pp. 337 – 391, (1998).

[13] M.M. Chiawa, J.T. Torruam and C. C. Abur, Cointegration and Causality Analysis of Government Expenditure and Economic Growth in Nigeria *International Journal of Scientific & Technology Research*, VOL 1 (2012).