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The Human Capital Development and Economic Growth: Nigerian Experience

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Abstract. The impact of human capital development on economic growth in Nigeria has been a subject of discussion with most authors emphasizing its significance to economic development. The study, using secondary date between 1980 and 2015, autoregressive distributed lag to co-integration, results noted presence of a long run co-integrating relationship among the variables and that capital education expenditure contributes negatives to growth. The study therefore recommends that government should improve on her human capital development drive and also channel her expenditure on education to areas where they are necessary so that it can contribute positively to growth.

Keywords: Human Capital, Economic Growth, Education Expenditure, Capital Formation and School Enrolments

1. Introduction

The pace of Nigerian economic development has been at a snail speed and has remained so for decades despite its abundant human and natural resources at its disposal. It is disheartening to note that countries like Malaysia, Indonesia, Taiwan, Singapore and South Korea that had similar Per Capita Income, GDP growth rate and under-developed political structures like Nigeria in the 1960s and early 70s have escaped underdevelopment and poverty and are today, owing to the manner in which their economy have been managed, are now regarded as Asian Tiger economy which serve as models for other economies in the world. These countries are now excelling economically and technologically as a result of their sustained investment in human capital development.

In fact, the development of any nation cannot be deciphered from the quality of its human capital, more so, that there is a paradigm shift across the globe towards more knowledge based sector, skills and human capital development (OECD, 1990). This involves acquisition and increase in number of persons that possess the skill, education, experience and expertise which are necessary for economic and political development of a country. Thus, **Jhingan (2012)** sees human capital development as being associated with investment in man and his development as a creative and productive resource. The African Development Bank Report (1998) viewed human capital development as an essential means of

sustaining economic growth and also an end in itself.

According to Babalola (2003), the rationale behind investment in human capital is based on the following arguments; that the new generation must be given appropriate part of knowledge which has already been accumulated by previous generation, that the new generation should be taught how existing knowledge which has already been accumulated by previous generation, that the new generation should be taught how existing knowledge should be used to develop new product to introduce new process and production methods and social services, the people must be encouraged to develop entirely new idea, product processes and methods through creative approaches.

In Nigeria, efforts had been geared in the past towards human capital development by policy makers owing to the recognition of the fact that any nation desiring guaranteed economic vitality and sustained economic growth must of necessity place high premium on improved manpower as this is needed to articulate, nurture, operate and sustain enabling policies, functional system and effective institutions to meet National objectives. Therefore, it can be asserted that human capital development practices ensures that citizens are better producers as observed by the researcher is the case Asian Tigers. The main objective of this paper is to explore the relationship that exists between human capital development and the economic growth in Nigeria. In specific terms however, the paper will aim at achieving the following objectives: determine whether government expenditure on health and education have any significant effect on economic growth in Nigeria and determine whether there exist a significant relationship between expenditure on education and economic growth in Nigeria.

2. **Review of Relevant Literature**

2.1 Concept of Human Capital

There is no generally acceptable definition of human capital as different author has put forward different definition of their perception of the concept. According to Adam Smith (1776), a classical economist who asserted that human skills increase wealth for society as well as for the individual. The OECD (2001) referred human capital as the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being. It is the aggregation of investments in activities such as education, health, on-the-job training and migration that enhances an individual's productivity in the labor market (Kiker 1966, Becker 1964, Schultz 1961, 1962).

Put differently, Akingbade (2006) opined that human capital development implies building an appropriate balance and critical mass of human resource base and providing an enabling environment for all individuals to be fully engaged and contribute, to national development efforts. It involves providing opportunities for all citizens to develop to their fullest potentials through education, training and motivation as well as creating the enabling environment for everyone to participate fully in national development.

2.2 Empirical Review

Several studies, both in Nigeria and overseas have been carried out to examine the relevance of human capital development in the achievement of economic growth. There seems to be a consensus from most of these studies that the development of human

capital engenders economic growth. Loening (2004) investigated the impact of education on economic growth for the 1951 to 2002 period using error correction model and the result show that a better educated labour force had a positive and significant impact on economic growth. The growth accounting framework demonstrated that human capital explained about 50% of output growth. Similarly, Self and Grabowski (2004) studied the impact of education on economic growth in India established that primary education had a strong causal impact on growth than the impact of secondary education. And it was evident that female education at all levels had impact on economic growth while male education had a causal impact on growth only at the primary level.

Using co-integration and error corrections mechanisms to determine the relationship between human capital and economic growth in Nigeria, Adamu (2003) established that investment in human capital in the form of education and training led to economic growth because of its impact on labour productivity. The author attributed the negative sign of growth rate of enrolment of graduates in tertiary institution to the time lag required for the impact of graduates to be felt on economic growth in terms of their contribution to national productivity.

Garba (2003), using Nigerian data developed a system analysis framework as an alternative to empirical studies for elucidating the relations between human capital formation, utilization and development through the network of relations between the formal, informal and the foreign sectors of the Nigerian economy and the result shows a dysfunctional process and a triad of failures of institutions, state and market in Nigeria. The dysfunctional process created great divides between the components, which constitute formidable obstacles to Nigeria's developmental process.

Babatunde and Adefabi (2005) investigated the long run relationship between education and economic growth in Nigeria between 1970 and 2003 through the application of Johansen Co-integration technique and Vector Error Correction Methodology. It examines two different channels through which human capital can affect long run economic growth in Nigeria. The first channel is when human capital is a direct input in the production function and the second channel is when the human capital affects the technology parameter. The Johansen Co-integration result establishes a long run relationship between education and economic growth. A well-educated labour force appears to significantly influence economic growth both as a factor in the production function and through total factor productivity.

Otu and Adenuga (2006) empirically examine the relationship between economic growth and human capital development using annual data from 1970 to 2003. Capital and recurrent expenditure on education and enrolments into primary, secondary and tertiary education were used as proxy for human capital. Co-integration and error correction mechanism technique was used for analysis. It was found that investment in human capital, through the availability of infrastructural requirements in the education sector accelerates economic growth. Physical capital formation was correctly signed and statistically significant at 1 per cent level of significance.

3. Methodology and Data Analysis

Following the review of the theoretical literature, the specification for the model in log-linear form in Nigeria is given as:

$$LnRGDP_t = a + bLnGFCF_t + cLnCEE_t + dLnREE_t + eLnHC_t + \varepsilon_t \quad (1)$$

Equation (1) is RGDP is measured by the real gross domestic product, GFCF is the gross fixed capital formation, CEE is capital education expenditure, REE is recurrent education expenditure and HC is human capital index. Based on theoretical postulations, we expect an estimate of b, c, d and e to be positive. All the data were sourced from the Central Bank of Nigeria Statistical Bulletin and the human capital index is sourced from the World Bank Development Indicators. To distinguish the short-run effects from their long-run effects, Equation (1) is specified in an error–correction modeling form. Following Pesaran et al.'s (2001) bounds testing approach and rewrite (1) as follows:

$$\begin{aligned}\Delta LnRGDP_t &= \alpha + \sum_{i=1}^{n1} \beta_i \, \Delta LnRGDP_{t-1} \\ &+ \sum_{i=0}^{n2} \delta_i \Delta \, LnGFCF_{t-1} + \sum_{i=0}^{n3} \varphi_i \Delta \, LnCEE_{t-1} \\ &+ \sum_{i=0}^{n4} \omega_i \Delta \, LnREE_{t-1} + \sum_{i=0}^{n5} \eta_i \Delta \, LnHC_{t-1} \\ &+ \rho_0 LnRGDP_{t-1} + \rho_1 LnGFCF_{t-1} \\ &+ \rho_2 LnCEE_{t-1} + \rho_3 LnREE_{t-1} \\ &+ \rho_4 LnHC_{t-1} \\ &+ \varepsilon_t \end{aligned} \quad (2)$$

Without lagged level variables equation (2) will be a standard VAR model. The linear combination of lagged level variables have replaced the lagged error term from equation (1), resulting in error–correction model expressed in equation (2). Pesaran et al. (2001) propose applying the familiar F-test for joint significance of the lagged level variables as a sign of co-integration. However, in this context, the F-test has new critical values that they tabulate. Since the critical values account for integrating properties of all variables, there is no need for pre unit root testing under this approach and variables could be I(0) or I(1) which is the main advantage of this method. Once co-integration is established, estimates of $\rho_1 - \rho_6$ normalized on ρ_0 will yield the long-run effects of all exogenous variables. The short-run effects are reflected by the estimates of coefficients attached to first-differenced variables.

4. Results of findings

The presentation of the empirical results starts with the stationarity properties of all the variables. The Augmented Dickey Fuller (ADF) procedure test the null hypothesis of a unit root and results from the ADF unit root tests are shown in Table 1 and indicate that all the series are non-stationary in levels, but stationary in first differences. The exception to this finding is the human capital index which is significant at level.

Table 1: Unit Root Test, 1980-2015

Series	ADF
LnRGDP	-2.382
ΔlnRDGP	-6.822*
LnGFCF	2.045
ΔlnGFCF	-9.169*
LnCEE	-1.032
ΔlnCEE	-9.538*
LnREE	0.257
ΔlnREE	-5.206*
LnHC	-3.037
ΔlnHC	-7.596*

Notes: Proper lag length for each test was chosen by AIC.

* Indicates significance at the 1% level.
** Indicates significance at the 5% level.
*** Indicates significance at the 10% level.

Since the above results show that the variables are of different order of

integration, thus the need for adopting the Pesaran et al.'s (2001) approach to estimate error–correction model in equation (2). Since data are annual, we follow the literature and impose a maximum of four lags on each first-differenced variable. We then use Akaike's information criterion (AIC) to select optimum lags. The results are reported in Table 2.

Table 2 Full Information estimates of equation (2)

Lag order	**0**	**1**	**2**	**3**
Panel A: Short-run coefficients estimates				
ΔlnGFCF	0.087 (2.684)**			
ΔlnCEE	-0.035 (2.742)**			
ΔlnREE	0.022 (1.887)***			
ΔlnHC	-0.029 (1.529)			
Panel B: Long-run coefficient estimates				
Constant	lnGFCF	LnCEE	LnREE	LHC
3.741(3.752)*	0.300 (3.974)*	-0.118 (2.959)**	0.074(1.557)	-0.099(1.195)
Panel C: Diagnostic statistics				
F	ECM	LM	RESET	Adjusted R2
5.291	-0.298 (2.905)*	0.603	0.347	0.76

Notes: (a) Numbers inside the parentheses are absolute values of the t-ratios.
(b) The upper critical bound value of the F-statistic at the 5% significance level is 4.0.
(c) LM and RESET are the Lagrange multiplier test of first-order serial correlation and Ramsey's test for functional form, respectively.
(d) ** and * denote significance at the 5 and 1% levels, respectively.

Panel A reports in Table 2 reports the short-run estimates, Panel B reports the long-run estimates. Finally, Panel C reports diagnostic statistics. From the short-run coefficient estimates in Panel A, it is clear that there is at least one short-run significant coefficient obtained for every first-differenced variable except the human capital index. Thus, we can conclude that gross fixed capital formation, both capital and recurrent education expenditure are significant factors influencing the level of growth in the short run in Nigeria.
Panel B, examine whether or not the short-run effect is permanent on transitory. It was discovered that gross fixed capital formation and capital expenditure on education is a significant factor influencing the level of growth in Nigeria in the long run, while recurrent education expenditure and human capital index are not significant factors influencing the level of growth in Nigeria in the long run.

Concerning the signs and magnitude of the parameter estimates it was discovered that only gross fixed capital formation and recurrent education expenditure have a positive relationship with growth, while capital education expenditure and human capital index is negatively signed. The implication of this result is that most capital expenditure on education are not spent in the right

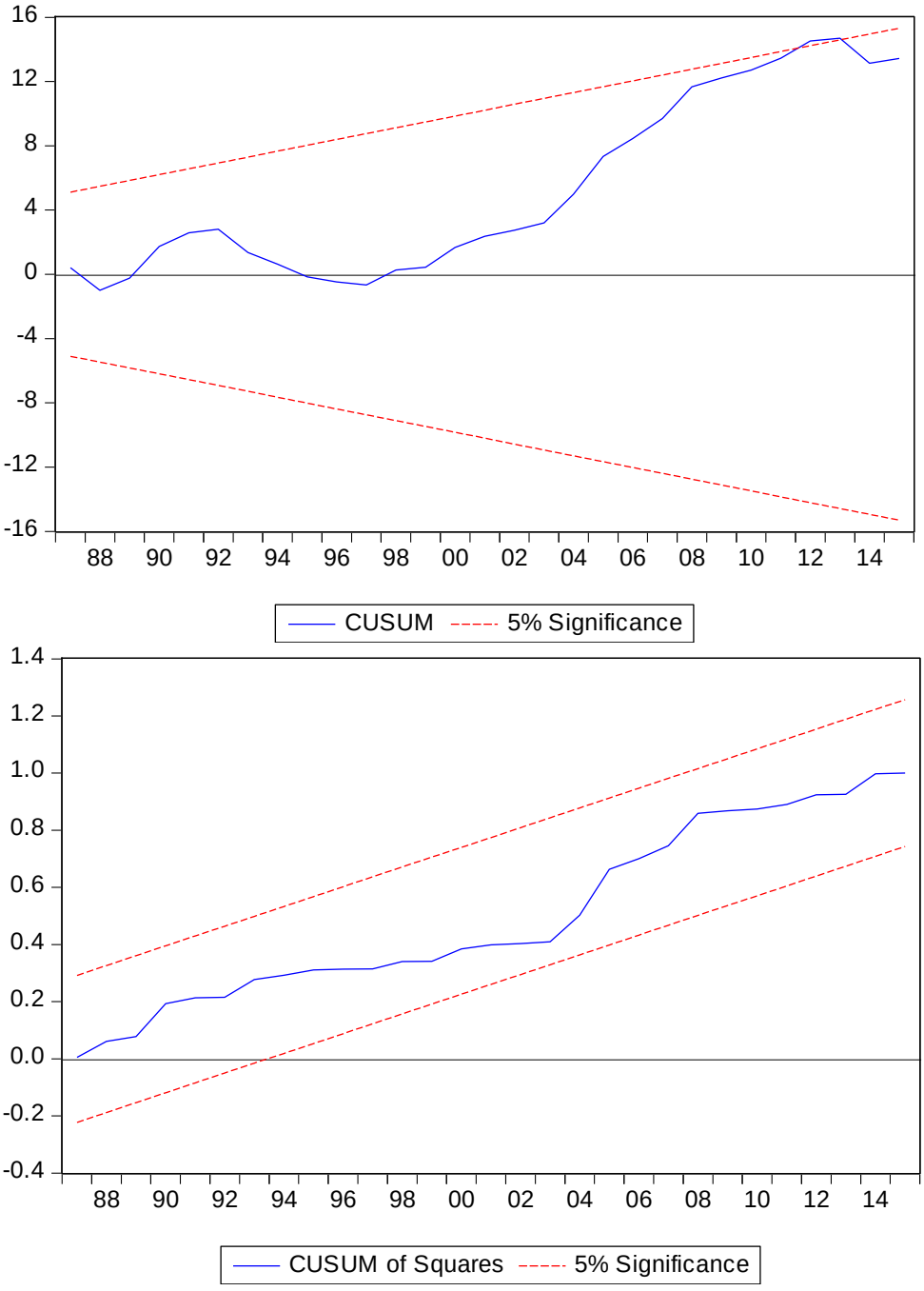
way. However, for these long-run coefficients to be meaningful, we must establish that the variables are co-integrated. To this end, we proceed to Panel C.

The results of the F-test along with other diagnostic statistics are reported in Panel C of Table 2. Given the 5% upper bound critical value of the F-test at 4.0, our calculated statistic of 5.291 is significant, supporting co-integration. Another sign of co-integration could stem from the fact that variables are adjusting toward their long-run equilibrium values. To test this hypothesis, we use the normalized long-run coefficient estimates from Panel B, generate the error term, and call it ECM. We then replace the linear combination of lagged level variables in Equation (2) by ECM_{t-1} and estimate this new specification after imposing the same optimum lags reported in Panel A. If variables are to adjust toward their long-run equilibrium values, ECM_{t-1} must carry a significantly negative coefficient. This is indeed the case from Panel C. The estimated coefficient itself reflects the adjustment speed. In Nigeria, for example, 30% of the adjustment takes place within one year.

Reported in Panel C are also the Lagrange multiplier (LM) and Ramsey's RESET statistics. The LM statistic is used to test for first-order serial correlation and the RESET statistic is for model specification. Both are distributed as $\chi 2$ with one degree of freedom. Given its critical value of 9.48 at the usual 5% significance level, both statistics are insignificant supporting autocorrelation free residuals and correctly specified model.

Lastly, we examine whether all the coefficient estimates, that is, the short-run as well as the long-run estimates, are stable. We applied the well-known CUSUM and CUSUMSQ tests proposed by Brown, Durbin, and Evans (1975) to the residuals of the optimum error-correction model. These tests required that the sample be broken, with enough observations before and after the break point. The two CUSUM and CUSUMSQ statistics are then updated by moving one observation from one period to the other. The statistics are then plotted against the break points or break dates. If all coefficients are to be stable, the plot of these statistics should stay within a significance level of 5 percent. As shown in Figure 1, the estimated model is stable.

Figure 1. Plots of CUSUM AND CUSUMSQ



5. Summary and Conclusion

This study examines human capital development and its impact on economic growth in Nigeria using data for the period 1980-2015. The justification for the study is to assess the contribution of government expenditure on education with particular reference to human capital index. Using the bounds-testing approach for co-integration and error-correction modeling, a standard model was estimated and results suggest that there is a long run relation relationship between the variables of interest and also that the system adjust back to equilibrium using the error correction model. We also found that gross fixed capital formation, capital education expenditure and recurrent

education expenditure are significant factors influencing the level of growth in Nigeria, but capital education expenditure contributes negatively to growth. The implication of the result is that government should try to focus her expenditure to areas where they are needed and also that they should try to invest on human capital development as this is the key to the development of any nation.

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