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Investment in Human Capital and Economic Growth in Nigeria Using a Causality Approach

INVESTISSEMENT EN CAPITAL HUMAIN ET CROISSANCE ECONOMIQUE AU NIGERIA GRACE A UNE APPROCHE DE CAUSALITE

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Abstract

The paper examined the causal nexus between human capital Investment and economic growth in Nigeria for sustainable development in Africa at large between 1970 and 2009 using a Vector Error Correction (VEC) and Pairwise granger causality methodologies. The variables used in the study were tested for stationarity using the Augmented Dickey Fuller and Philip Perron test. The result showed that the variables are stationary at first differencing. Co-integration test was also performed and the result revealed the absence of co-integration between Investment in human capital and economic growth. The findings of the VAR model and pairwise estimate revealed no causality between human capital development and economic growth. The study recommends the need to increase budgetary allocation to the education and health sector and the establishment of sound and well-functioning vocational institute needed to bring about the needed growth in human capital that can stimulate economic growth. Also, the study identified that labour mismatch is an issue that government needs to reckon with in order to accelerate and sustain economic growth. In this regard, policy-makers in conjunction with employers and individuals needs to up date information on the real labour market value of different qualifications, in order to help them navigate through the increasingly complex education system and make the optimal kinds of educational investment decisions needed to propel economic growth.

Key words: Human capital; Economic growth; Pairwise; Causality; VAR; Sustainable development; Budgetary allocation

Résumé

Le document examine le lien de causalité entre l'investissement en capital humain et croissance économique au Nigeria pour le développement durable en Afrique en général entre 1970 et 2009 en utilisant un vecteur de correction d'erreur (VEC) et les méthodologies de causalité de Granger par paire. Les variables utilisées dans l'étude ont été testés pour stationnarité en utilisant les Dickey Fuller et Philippe Perron Test. Le résultat a montré que les variables sont stationnaires au différenciation première. Co-intégration de test a également été effectué et le résultat a révélé l'absence de co-intégration entre l'investissement en capital humain et croissance économique. Les résultats du modèle VAR et estimer paires n'ont pas révélé de lien de causalité entre le développement du capital humain et croissance économique. L'étude recommande la nécessité d'accroître l'allocation budgétaire au secteur de l'éducation et la santé et la création de sons et de bon fonctionnement institut professionnel nécessaire pour provoquer la croissance nécessaire dans le capital humain qui peut stimuler la croissance économique. En outre, l'étude a identifié que l'inadéquation du travail est une question que le gouvernement doit compter avec dans le but d'accélérer et de soutenir la croissance économique. À cet égard, les décideurs politiques en collaboration avec les employeurs et les personnes ayant des besoins de mise à jour des informations sur la valeur réelle du marché du travail des qualifications différentes, afin de les aider à naviguer dans le système éducatif de plus en plus complexes et faire le genre de décisions d'investissement optimales éducatives nécessaires à la propulser la croissance économique.

Mots clés: Le capital humain; La croissance économique; Par paires; Causalité; VAR

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INTRODUCTION

Over the last few decades the tie between human capital investment via education and economic growth in Nigeria and other developing countries has attracted the attention of many economists. This is due to the common assumption that investment in human capital vis-à-vis education has had an important positive effect on economic growth and sustainable development but to date the evidence, for this supposition has been surprisingly weak in the attempt to ascertain extensively whether or not the attainment of education has contributed significantly to the generation of overall output accrued to an economy. Despite that there had been inconsistencies and controversial result that has led to an inconclusive answer to the above raised question as opined by Pritchett (1996).

As a matter of fact, a country cannot achieve any meaningful economic growth without adequate human and natural resources that is aimed at enhancing a sustainable development. Sustainable development when critically assessed entails three pillars such as; economic development, social development and environmental protection as observed by IMF (2000). In spite of this, the process of economic performance is inadequately conceptualized and poorly understood and as a result it has partly been attributed to lack of a generalized or unified theory and also the myopic way conventional economist approaches such issues according to Arielavis etal (2007).

One of the challenges facing the global and national communities is to achieve sustainable development. Sustainable development has three pillars-economic development, social development and environmental protection (IMF, 2002). It entails balancing the economic, social and environmental objectives of society, integrating them, wherever possible through mutual supportive policies and practices and making trade off where such integration is not possible.

Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This automatically subsumes some notion of fairness of access to basic resource needs for all population both in the present and in the future. Economists have been at pains to make sense of the reclusive condition for sustainability. However, various interpretations of the definition of sustainability have consequently emerged. While the debate still lingers on how to develop appropriate indicators for measuring the concept. There is a consensus that sustainability is the capacity for continuance into the future (Pearce, 1997). The sustainability concept recognized that life is a complex bundle of values, objectives and activities with ethical, environmental, economic and social dimensions (Ekong 1995)

Although a country like Nigeria has not completely been able to achieve this as a result, it's over dependence on oil and imbalance in her policy measures. However, the theoretical basis of education on economic growth is rooted in the endogenous growth theory (Solow's growth model) which emphasize on the relevance of investment on education as an input to production. More recently endogenous growth model focuses attention to human capital and innovation, capacity and now the focus of economic growth has moved to Myrdal's cumulative causation theory and the new economic geography school. Economists believe that, endogenous growth is linked with improvement in productivity which results to a faster pace of innovation and extra investment in human capital.

The growth theorist further predicted that externalities and spillover effects from development of a high valued added knowledge economy that is able to develop and maintain a competitive advantage in growth industries in the global economy. Indeed there is rather a strong theoretical basis pertaining the key role of human capital in economic growth as opined (by Romer 1986, 1990; Lucas 1988 Quah and Rauch 1990, Grossman and Helpman 1991, Rivera-Batiz and Romer 1991) The empirical evidence is however related to contentious issues such as measurement of human capital while recent studies has provided mixed assessments on the magnitude of social returns to human capital.

Besides, countless studies both at micro and macro level have researched on this subject matter i.e. to assert or refute whether education has impacted on sustainable development and growth in Africa or not?. The former is aimed at knowing if education at the individual point of view has imparted on employment rate, earnings and produce more output relative to those who are less educated. While the latter is to identify if truly human capital investment via - education has contributed to the total output of the economy or not. It is pertinent to assert from the above that at macroeconomic level, empirical evidences relating to the changes in education measures to economic growth has so far been ambiguous.

Though researchers like that of the International Institute of Applied systems Analysis (IIASA) believe that to overcome these inconsistencies that has emanated in the past studies is that a new dataset needs to generate a new dataset on educational attainment as observed by IIASA (2008).

In Nigeria, the future direction of macroeconomic policy of investing in educational capital is uncertain based on the fact that, the existence of macroeconomic disequilibrium in financial allocation and unsatisfactory

performance of the country's economy in the recent times.

Although, some economist believes that the reason why most developing and underdeveloped economies have not achieved sustainable development is mostly attributed to the fact that, they have not been able to ascertain the tie between human capital investment and economic growth. Moreso, because they have not also asserted concretely whether economic growth and development cause human capital investment enhancement or that human capital investment causes economic granted and sustainable development in Nigeria. Hence the thrust of this study is to investigate the tie between human capital investment and economic growth in Nigeria Also, the contribution of this paper is to fill the above existing gaps using Myrdal's cumulative causation theory.

Expectedly the structure of this paper is clear and as follows. The next section briefly reviews the relevant literatures and also proffers theoretical evidences. Thereafter section three focuses on the specification of model and analytical framework, which is followed up by the discussion of the estimation techniques and data sources while in section four empirical findings are discussed. The study is rounded up with the summary, conclusion and recommendations.

1. REVIEW OF RELATED LITERATURE / THEORETICAL FOUNDATION

The growing evidence on the role and relevance of human capital investment via education in the development process of an economy for sustained growth and development is increasing in an alarming rate. Education at all levels has been identified to contribute to economic growth through imparting of skills, discipline that is required for various work places. It is pertinent to pinpoint that the significance of the educational system to any labour market would highly depend on its ability to produce a literate, disciplined, flexible labour force vis-à-vis high quality education. Consequently with economic development induced by new technology is applied to production which results in an increase in the demand for workers and better education.

In particular, the pioneer work in this regard is the work of Lucas (1988) who revealed that the growth rate of human capital is dependent on the amount of time an individual puts into acquiring skills. This is followed up by the work of Easterly and Rebelo (1993) who opined that the creation of new idea is a direct function of human capital that manifest in the form of knowledge which in turn has led to growth in physical capital and economic growth.

Another aspect of literature is the theory of cumulative causation developed by Myrdal (1957) and Kalder (1970) which argued that initial condition of production determines economic growth such that it places emphasis on self-sustainability. Although there is tendency for positive spillover effects spreading growth from the more to the less advanced economies, this is because they are incapable of bringing the system into a balance state due to the fact that the market forces alone are left at work.

The advent of democratic regime in 1999 for example, has made the Nigerian government to place its emphasis on the need to invest adequately in human capital via educational sector which has reflected on the federal government spending between 1999 and 2009 respectively. This expenditure has been fluctuating till date. For instance in 2007, it fell from 10.4% it was in 1980 to 8.7% in 2007 and later rose to 9.6% in 2009.

Studies like that of Akram and Pada (2009) conducted a survey to assert the relationship between education and economic performance which emerged from the review of literatures. The study revealed that there exist a positive relationship between education and economic growth.

In a similar vein, Ararat (2007) measured the role and effect of education on economic growth in two of the largest economies of the former soviet Bloc i.e. the Russian federation and Ukraine. The aim of the study among others was to estimate the relevance of diverse educational levels for the initiation of substantial economic growth. The study adopted and estimated the model of endogenous economic growth and the system of linear and log-linear equations that accounted for different time lags as the possible impact of higher education on economic growth. The results from the model showed that there is no significant impact of educational attainment on economic growth, but that increase in access of the population to higher education can bring positive results to the per-capita GDP growth in the long run.

Bakare (2006) investigated the growth implications of human capital investment in Nigeria by using vector auto regression and Error corrections model. Findings from the study revealed that there is a significant functional and institutional relationship between the investments in human capital and economic growth in Nigeria such that 1% fall in human capital investment led to a 48.1% fall in the rate of growth in gross domestic output between 1970-2000 that was examined.

Babatunde and Afolabi (2005) measured the long run relationship between education and economic growth in Nigeria between 1970 and 2003 by applying Johansen Cointegration method correction model and vector error model. The findings reveals that there is a long run relationship between education and economic growth there by laying emphasis that a well-educated labour force appears to significantly influence economic growth both as a factor in the production function and through total factor productivity.

Furthermore, UNR (1996) expressed categorically that education is fundamental in enhancing the quality of life and ensuring social and economic progress. This is because education tends to play a key role in the ability

of a developing country to absorb modern technology and to develop the capacity for self- sustaining growth and development. Lee (1989) opined that the main problem that is associated with the belief that education is good for economic growth could be tied with how to maintain an equilibrium position. This equilibrium is in terms of balancing a scenario where there will be no shortage of the supply of educated people because such shortage may mar or limit growth while on the other hand excessive supply of it might create unemployment and thus limiting economic growth.

Griffin and Mckinley (1992) are of the opinion that human capital development is targeted at growth and development strategy intended to improve the well-being of people within a short time possible. To them, the implementation of strategy will require a change in the composition of government spending and that the percentage of the budget earmarked for activities which do not contribute to development should be reduced to the minimal that is, activities such as military defense among others.

On the contrary, Ayara (2003) provided evidence on the linkage between the paradose of education and economic growth in Nigeria using the standard growth accounting model. The results revealed that education has not had the expected positive growth impact on economic growth.

Put together, the finding from the array of literatures surveyed supports the notion that education matters for growth and development in both developed and developing countries. Also literature have proved overtime that there is the possibility that the relationship that existed in the theory may not be replicated in real economy activities given the presence of some factors, which may not be clearly identified in the theory Ajisafe et al. (2006).

This study is very significant because past studies have focused on the relationship between Investment in human Capital and growth such as that of Dauda, R.B. (2010), Adebiyi (2009) etc. by means of mere estimation and the like but this current paper attempts to evaluate the causation involved in the variables used.

2. SOURCE OF DATA AND METHOD OF ANALYSIS

The data used in this study are sourced from the Central Bank of Nigeria publications such as annual bulletin and statement annual reports for various years, covering the sample period 1970 – 2009. Before the causality test, it is important to examine the properties of the variables of interest and afterwards examine the extent of co-integration and correlation between the variables of interest.

2.1 Model Specification and Estimation

The objective of this study is basically to examine whether human capital development cause economic growth in Nigeria or if the reverse is the case. To achieve the above objective the co-integration, correlation and granger causality tests are utilized. Causality is said to be essential in econometrics analysis in the sense that it makes us to know whether a past change in one variable X has a corresponding impact on current variable Y or whether the relation works in the opposite direction.

The primary model is specified as:

$$HCD = f(Y) \quad (1)$$

where HCD represent human capital development (proxy by government expenditure on education); and Y represents economic growth (proxy by gross domestic product).

equation (1) is represented in a VAR model as:

$$HCD_t = \alpha_1 + \sum_{i=1}^{n} b_{1t} HCD_{t-1} + \sum_{i=1}^{n} b_{1t} Y_{t-1} + \varepsilon_{1t} \quad (2)$$

$$Y_t = \alpha_2 + \sum_{i=1}^{n} b_{2t} Y_{t-1} + \sum_{i=1}^{n} b_{2t} HCD_{t-1} + \varepsilon_{2t} \quad (3)$$

Where α_1, and α_2 are constants; ε_{1t}, and ε_{2t} are the random disturbance and n is the number of optimal lag length, which is determined by the Schwarz Bayesian Criterion (SBC) and Akaike's Information Criterion (AIC).

3. EMPIRICAL ANALYSIS AND DISCUSSION OF RESULT

3.1 Unit Root Test

A perquisite step usually taken in econometric analysis, to avoid spurious empirical estimates is the examination of the stationarity properties of data. This development is an outcome of the fact that most macroeconomic time series exhibit non-stationarity behaviour in their level form, which often poses a serious potential problem to econometric analysis, leading to spurious result if appropriate measures are not taken. To guard against spurious result, this study takes step in checking the properties of the variables with the use of the Augmented Dickey-Fuller (ADF) test developed by Dickey and Fuller (1979) and the Philip-Perron (PP) test. The result is presented in table 4.1 below.

As observed from the ADF test on Table 4.1, all estimating variables were non stationary at level but became stationary after first difference, implying that the variables are of order one. Hence, the null hypothesis on stationarity was rejected in all the series. The PP test results reported on the other half of Table 4.1 also confirmed the ADF test result.

Table 3.1
Unit Root Test on Variables with Intercept

	Augmented Dickey-Fuller (ADF) Test			Phillip-Perron (PP) Test		
Variables	Level	1st Difference	Status	Level	1st Difference	Status
Lhcd	-0.7857	-7.4083*	I(1)	-0.3406	-12.4933*	I(1)
Lrgdp	-2.2895	-5.7828*	I(1)	-1.4151	-5.7881*	I(1)
Test Critical values						
1%	-3.6105	-3.6156		-3.6105	-3.6156	
5%	-2.9390	-2.9411		-2.9390	-2.9411	
10%	-2.6079	-2.6090		-2.6079	-2.6090	

Source: Author's Computation
Note: * implies stationarity at one percent significance level.

Notes:
lhcd = Log of Human Capital Developmentlrgdp = Log of Gross Domestic Product

Table 3.2
Summary of the Co-integration Tests

	Trace Test				Maximum Eigen value Test			
	Null	Alternative	Statistics	95% critical values	Null	Alternative	Statistics	95% critical values
Model I	r=0	r≥1	9.5409	15.41	r=0	r=1	7.8410	14.07
	r≤1	r≥2	1.6999	3.76	r≤1	r=2	1.6999	3.76

Source: Author's Computation

3.3 Granger Causality Test

To examine the causation between the variables and to avoid biasness in model specification, this study utilized the unrestricted Vector Autoregressive (VAR) model to determine the direction of causality between human capital development and economic growth in Nigeria The VAR model was estimated using a lag length of one based on the Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion (AIC). In addition to ensure robustness of causality estimate, the pairwise causality test was also estimated.

Before estimating the granger causality test, the extent of correlation between pairs of variables was examined. This is important to detect the level of association between these variables. From the correlation result presented in Table 4.3, it was observed that a positive correlation exists between human capital development and economic growth. However, it is also observed that the extent of correlation is very low, implying a weak relationship between these variables. Turning to the granger causality result on Table 4.4a, it is observed that the t-stat values of human capital development (*LHCD*) and economic growth (*LRGDP*) are -0.9382 and 0.1969 respectively; indicating that there is no causality between human capital development and economic growth. The pairwise causality test result reported on Table 4.4b also confirmed the VAR causality test result. In the light of these convincing causality estimates, the null hypothesis of no causality between human capital development and economic growth is accepted. In other words, this implies that contrary to a prior expectation and evidence from studies in developed countries, human capital development have no causal influence on economic growth in Nigeria over the period of study.

Table 3.3
Correlation Matrix

Variables	Leduexp	Lrgdp
Leduexp	1.0000	0.1548
Lrgdp	0.1548	1.0000

Source: Author's Computation

Table 3.4a
VAR Granger Causality Test Result

H_0: Human Capital Development does not Granger Cause Economic Growth

Variables	Coefficient	Std. Error	t-stat
ΔLHCD(-1)	-0.1455	0.1550	-0.9382
ΔLRGDP(-1)	0.2847	0.03848	0.7399
C	0.2709	0.1431	1.8929

To be continued

Continued

Panel B: H_0: Economic Growth does not Granger Cause Human Capital Development

Variables	Coefficient	Std. Error	t-stat
ΔLRGDP(-1)	0.0336	0.1705	0.1969
ΔLHCD(-1)	0.0134	0.0687	0.1946
C	0.1278	0.0634	2.0154

Source: Author's Computation

Table 3.4b
Pairwise Granger Causality Test Result

H_0:	F-Statistic	Probability
Δlrgdp does not Granger Cause Δlhcd	0.54750	0.46427
Δlhcd does not Granger Cause Δlrgdp	0.03787	0.84683

Source: Author's Computation

CONCLUSION AND POLICY RECOMMENDATION

The endogenous growth theory by Romer and Lucas (1988) identified human capital development as an important factor in explaining the growth process. The emergence of the endogenous growth theory has been followed by empirical studies investigating the relationship between human capital development and economic growth. In line with related research in this area, this study examined the extent of causal nexus between human capital development and economic growth. The empirical analysis of this study revealed that there is no causality between human capital development and economic growth in Nigeria. This result is in contrast to theoretical proposition by Romer and Lucas (1988) and also in contrast to the findings of empirical analysis of the developed countries. The reason for the non-causality between these variables can be attributed to the progressive decline in the budgetary allocation to the educational and health sector over the years. There is therefore the need to increase the budgetary allocation to the education and health sector and the establishment of sound and well functioning vocational institute needed to bring about the needed growth in human capital that can influence economic growth.

Also, the labour mismatch is an issue that government needs to reckon with in order to accelerate and sustain economic growth. In this regard, policy-makers in conjunction with employers and individuals need up to date information on the real labour market value of different qualifications, in order to help them navigate through the increasingly complex education system and make the optimal kinds of investment decisions.

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