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# The Effect of Human Capital Development on Economic Growth in Nigeria (An Empirical Analysis during 1970 – 2011)

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**Abstract**
Nigeria's overreaching objective since independence in 1960 has been to achieve stability, material prosperity, peace and social progress; however, this has been hampered due to inadequate human capital development. This study was therefore carried out with the view to testing the effect of human capital development on economic growth in Nigeria. In order to achieve this, data were sourced from the CBN Statistical Bulletin and Federal Ministry of Education publication during 1970 – 2011. The Ordinary Least Square (OLS) statistical technique was employed in analysing the data. The study revealed a significant relationship between human capital and economic growth. Based on the findings, it was recommended amongst others that in order to achieve the overreaching objectives of the country, there should be enlightenment campaign on the need to allocate more funds during budgetary allocations toward developing human capital; improved infrastructure and expansion of institutional capacity to produce quality human capital at all levels.
**Keywords:** Primary Enrolment, Secondary Enrolment and Tertiary Enrolment; VIF; TOL;

## I. Introduction

Today's world economies are ruled by knowledge; a kind of economy that offers more promise than the black gold economy. As the global economy shifts towards more knowledge based sectors, for example, the manufacture of ICT devices, pharmaceuticals, telecommunications and other ICT based sectors, human capital development has become a central issue for policy makers and practitioners engaged in economic development both at the national and regional level (OECD, 1996). The study of economic growth starts with the study of the people who contribute to its progress. The people work with their own hands, design, build and operate the machines of production, and structure and run the institutions and markets that make growth possible. Simon (2000) asserted that the size of the human population together with the technologies these people produce is the root cause of economic growth. He rightly argued that people are the carriers of knowledge, but then goes on to the more controversial assertion that since the discoveries of the past were produced by people, the rate of discoveries must have been influenced by human numbers.

There are two approaches that have been distinguished in theoretical literature on human capital development and economic growth (Nelson and Phelps, 1966; Lucas, 1988; and Romer, 1990). The first approach focused on the stock of human capital as an explanation of cross-country growth differentials as suggested by Nelson and Phelps (1966). The second approach looked at human capital as an input factor in production function and points to the accumulation of human capital as the main factor driving economic growth (Lucas, 1988). This study adopted the approach as suggested by Lucas (1988) that human capital is the main factor driving economic growth; therefore the study examined how developing human capital can result in economic growth.

## 2. Prior Literature

Nigeria's overreaching objective since independence in 1960 has been to achieve stability, material prosperity, peace and social progress; however, this has been hampered as a result of internal problems (Abbas, 2001). Abbas further opined that among these problems, inadequate human capital development is a pivotal barrier to economic growth. In the past, much of the planning in Nigeria were centred on the accumulation of physical capital for rapid growth and development, without due attention to the important role played by human capital in the development process. The importance of human capital development gained reasonable attention, starting with the seminal papers of economic scholars in the 50's and 60's. In response to the increasing knowledge, Nigeria joined the 'League of Nations' that recognized the need to invest in her human resources, in order to ensure that the economy delivers on its potentials.

Over the years, successive Nigerian government recognized the importance of human capital in the development process and has embarked on various programme and projects which led to the establishment of

 

educational institutions and health centres throughout the country. However, in the late 1970's and early 1980's, federal government spending grew substantially, resulting in fiscal crisis, inflation and heavy borrowings. Subsequently, through the austerity measure adopted in 1982 and Structural Adjustment Programme (SAP) introduced in 1986, the country attempted to bring down fiscal deficits as part of its stabilization and adjustment programmes, often by reducing public spending on across - the board basis. These reductions resulted in unprecedented economic and social costs, as human capital development was neglected with adverse long-term development consequences (Oyinlola and Adam 2003). Thus, the ultimate goal of economic development which underscored the need to improve the well-being of people was overlooked.

In more recent times, however, renewed attention was paid to the role of human capital development in the country's development process and this prompted the federal government to declare in its 1999-2003 economic policy programme that "the economy exists for and belongs to the people, and at all times the general well-being of all the people shall be the overriding objectives of the government and the proper measure of performance" (FGN, 1999). This policy statement of the government was further reiterated in the federal government reform agenda, which was anchored on the National Economic Empowerment and Development Strategy (NEEDS). The NEEDS recognizes the centrality of human capital development in achieving economic growth. It was described as a vital transformational tool. Therefore, the strategy was aimed at empowering the citizenry to acquire skills and knowledge that would prepare them for the world of work.

Human capital is the term economists often use for education, health and other human capacities that can raise productivity when increased. In technical term, Todaro and Smith (2009) viewed human capital as the productive investment embodied in human persons. These include skills, abilities and ideas resulting from expenditures on education, on-the-job training programs, and health care. There have been attempts to empirically relate the concepts of economic growth and human capital development and these studies focused on a two-way relationship between economic growth and human capital development (Mankiw, Romer and Weil, 1992; Burnett, 1995; and Abbas, 2001). These studies however viewed human capital development as the central objective of human activity and economic growth as potentially very important instrument for advancing it. At the same time, achievements in human capital development can make a critical contribution to economic growth. There are, therefore, two distinct causal chains examined. Firstly, one runs from economic growth to human capital development, as the resources from national income are allocated to activities contributing to human capital development. Secondly, the other runs from human capital development to economic growth indicating how in addition to being an end in itself, human capital development help increase national income. Putting these two philosophies on both extreme, one would as a matter of general judgement argue that human capital development can bring about growth in an economy.

## 3. Empirical Underpin

In recent years various attempts have been made by researchers to determine the effect of human capital development on economic growth (Ranis and Stewart, 2001; Adamu, 2003; and Mustafa, Abbas and Saed, 2005). Most empirical studies used education attainment as a proxy for human capital and investigate the relationship between the level of education or educational improvement and output growth at country level (Nelson and Phelps, 1966; and Lucas, 1988). There are also several studies that have investigated the factors that affect the rate of human capital development (Flug, Spilunbergo and Wachtenchein, 1998; and Kredler, 2001).

Nelson and Phelps (1966) showed that high level of human capital facilitates the adoption of new technologies. In contrast to this view, Lucas (1988) focused on skill acquisition as an input in an aggregate production. Romer (1990) assumed that both the stock as well as the growth of human capital generates ideas for new designs and goods which in turn drive endogenously physical capital investment and growth. Mankiw, Romer and Weil (1992) asserted that physical capital and human capital investment rates (as ratio of GDP) drives economic growth.

Flug, Spilunbergo and Wachtenhein (1998) argued that more equal income distribution implies that more families can afford to send their children to school and invest in their education. Using emerging Asian countries as a case study, they found that income inequality has a significant negative effect on secondary school enrolment rates, in that it represents a lack of resources and access to finance education. While the observation is right, it may not be compatible with Nigeria's experience. Evidence have shown that a reasonable proportion of Nigeria's children have access to secondary education, even in the face of income inequality. This is made possible due to free education that various governments extended to primary, secondary and tertiary education. In essence, government policies can minimize the effects of income differentials. The study, on the other hand was made for emerging Asian countries and not Nigeria.

Abbas (2001) examined a comparative study of Pakistan and Sri Lanka, by analyzing the impacts of human capital development on economic growth for Pakistan and Sri Lanka. The results of empirical analysis showed that primary schooling enrolment rates has negative, while secondary and higher schooling enrolment

 

rates has positive and significant impact on economic growth for both countries. The study combined the schooling enrolment rates at different levels of education with employment to generate effective labour input that performed better as compared to simple schooling enrolment rates and it again concluded that there are important growth effects associated with human capital. A shortcoming of the empirical work, however, is that the quality of human capital is not accounted for. Secondly, the research was done for another country and not Nigeria.

Kredler's (2001) study; Experience Vs Obsolescence: A vintage human capital model showed in an infinite horizon overlapping generations' model with endogenous human capital development that younger generations receive a higher premium on technology-specific skills. The incentive created by this premium includes young individuals to accumulate human capital faster than older generations did, which in turn induces a higher rate of growth in earnings. Lee and Barro (2001), observed schooling quality in a cross section of countries, using cross-country education production function. They found that family characteristics, such as income and the education of parents are strongly related to different school outcomes. However, cross country data do not account for unobserved heterogeneity and this may be true in Nigeria.

Ranis and Stewart (2001) empirically investigated a two-way relationship between economic growth and human capital development in Latin America. The study viewed human capital development as the central objective of human activity, and economic growth as potentially very important instrument for advancing it and at the same time proposing that achievements in human capital development can make a critical contribution to economic growth. On the contrary, Kristel (2002) examined the role of public expenditure on education; proxy the average level of human capital per worker with average years of schooling of the adult population aged 15 and over at the beginning of each period. However, the result of regression (OLS) showed that countries with a highly educated adult population need not always be the high growth countries. Countries where the average years of schooling of the adult population was already high in 1971 (USA, Canada, Australia, Switzerland and New Zealand) grew on average considerably slower during the period 1971-2000 than countries with a lower initial average educational attainment of the adult population (Ireland, Finland, Spain and Japan).

Adamu (2003) undertook an empirical investigation to determine the impact of human capital formation on economic growth in Nigeria between 1970 and 2000, using co-integration and Error-Correction Mechanisms (ECM). The results indicated that investment in human capital in the form of education and training can lead to economic growth because of its impact on labour productivity. Adamu aggregated all fields of education, as a proxy for human capital although not all fields of education/specification contribute equally to the skill formation needed to facilitate the adoption or innovation of new technologies, yet they received the same weight in the computation.

Uwatt (2003) provided empirical evidence on the role of human capital development proxied by enrolment in educational institutions on economic growth in Nigeria, using the augmented growth model and relying on co-integration and Error-Correction Mechanism (ECM). The results showed that human capital development does not only contribute positively to economic growth but its impact is strong and statistically significant.

Mustafa, Abbas and Saed (2005) investigated the role of human capital development and vocational training on economic growth in Pakistan. They reviewed and analyzed the status of vocational training, related policies and practices and their impact on development of human capital. The effect of the rate and variability of increase in institutions, primary, secondary and tertiary enrolments on output growth variability was also explored. The study revealed that the fluctuations in rate and variability of vocational indicators have serious implications for the output growth variability hence; the output growth variability was regressed on the rate and variability impact of the vocational indicators on the output growth variability. The analysis of the impact of vocational indicators showed that the long term planning is required to achieve the benefits of current policies. The study revealed a positive and significant relationship between the growth of institutions and output growth variability. Moreover; school enrolment played a significant role in determining the output growth variability. The empirical evidence therefore suggests that despite the fact that there are a lot of factors that contribute to economic growth; primary, secondary, and tertiary enrolments are also formidable factors that can be weighed as issue relating to economic growth in any economy of the world, especially for a developing economy like Nigeria.

## 4. Research Methodology/Interpretation of Results

In this present study, the use of Ordinary Least Square (OLS) estimation technique was used in providing an econometric equation that modelled Gross Domestic Product (GDP), Tertiary, Secondary and Primary Enrolments in a multiple regression. Multiple regression is a statistical procedure that is used to determine the impact of more than one variable on the dependent variable. As a statistical procedure, it is used to establish the degree of relationship among independent variable. As a result, the multiple regression statistics is then able to determine the impact of each variable on the dependent variable exclusively by holding down the impact of other

 

variables. The model or curve fit of a linear relationship between each independent variable and the dependent variable in a study can then be well presented. The model specification takes the below form:

$$GDP = a_0 + PSE_{b2} + SSE_{b2} + TSE_{b3} + U_t$$

Where:

GDP = Gross Domestic Product
PSE = Primary School Enrolment
SSE = Secondary School Enrolment
TSE = Tertiary School Enrolment
Ut = Error Term

The multiple regression output contains various parameters which are often denoted as regression coefficients such as $r^2$, $r^2$ adjusted, t-test, f-test, Dw test, VIF, TOL, standardised and unstandardized beta coefficient. The analysis of the data was done based on the regression coefficients. A summary of the outcomes of the data analysis are presented below:

**Table 1: Summary of OLS Result**

| Sbi | | $R^2$ | $R^2$ adj. | t-test | Dw | VIF | TOL |
|---|---|---|---|---|---|---|---|
| **Constant:** | .840 | | | 2.671 | | | |
| **PSE:** | .098 | .863 | .851 | 9.210 | .437 | 1.000 | 1.000 |
| **SSE:** | .075 | | | 7.458 | | 1.000 | 1.000 |
| **TSE:** | .033 | | | 6.456 | | 1.000 | 1.000 |

Source: Regression Output

The $R^2$ suggested that 86% of the total variation in Gross Domestic Product (GDP) has been explained by Primary (PSE), Secondary (SSE) and Tertiary (TSE) Enrolment (proxies for human capital). This is a good fit since the unexplained variation is just 14% (1 – 0.86). The $R^2$ adjusted which is used to ascertain the degree of freedom suggested that 85% of the changes in the GDP have been explained by PSE, SSE and TSE and this is also a good fit since the unexplained variation is just 15% (1 – 0.85). Furthermore, the t-test suggests that PSE with value (9.210 > 2.671); SSE with value (7.458 > 2.671) and TSE with value (6.456 > 2.671) shows that all the independent variables were statistically significant in explaining the changes in GDP. Additionally, the result also suggests a positive linear relationship between PSE, SSE and TSE with GDP. That is, an increase in PSE, SSE and TSE by a unit will increase GDP by .098units, .075units and .033units respectively. The Dw with value (.437) showed support for the existence of first order serial correlation in the model.

In measuring the degree of linear association, the Variance Inflator Factor (VIF) and Tolerance level (TL) was used. The result also suggests a perfect collinearity between PSE, SSE and TSE and GDP. This was established by the VIF and TL with values 1.000, 1.000 and 1.000 for TOL respectively and 1.000, 1.000 and 1.000 for VIF respectively.

## 5. Conclusion/Recommendations

In the latest years, academic research has shown in an increasing number of countries that certain human capital parameters could have a positive or negative effect on economic growth. In the context of the present study, primary, secondary and tertiary enrolments were examined during 1970 – 2011, by applying a methodology focusing on the coefficients of determination of the performed regression. In an attempt to interpret the findings of the study, it was found that human capital development leads to economic growth in Nigeria. The findings of the study thus calls for recommendation that in order to achieve the overreaching objectives of the country, there should be enlightenment campaign on the need to allocate more funds during budgetary allocation towards developing human capital, improved infrastructure and expansion of institutional capacity to produce quality human capital at all levels. The funds provided during budgetary allocation should be made accessible by agencies responsible for promoting education in order to improve schooling at all levels. Furthermore, educators, policy makers and government should strike a balance between gender inequalities in promoting human capital. Finally, there are opportunities for further research to explore the empirical fit of alternative time-series processes linking human capital and economic growth in Nigeria using other variables.

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