

**AN EMPIRICAL ANALYSIS OF THE IMPACT OF INVESTMENT IN EDUCATION  
ON ECONOMIC GROWTH IN NIGERIA.**

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## **Abstract**

The crucial role education plays in the overall development of a nation cannot be overemphasized. It is not only seen as a key to poverty reduction and vehicle for promoting equity, fairness and social justice but also helps to supply the essential human capital which is a necessary condition for sustained economic growth. Thus, enhancing effective investment on education has been a tenet of growth and development strategies of most countries. The basic objective of this paper is to carry out an empirical investigation on the relationship between investment in education and economic growth in Nigeria, using annual time series data from 1980 to 2010. The paper employs Johansen cointegration technique and error correction methodology. Empirical results indicate that there is, indeed a long-run relationship between investment in education and economic growth. All the variables including, labour force, gross fixed capital formation and educational capital appear with the expected positive signs and are statistically significant (except labour force) in the Nigerian economy. The findings have a strong implication on educational policy in Nigeria. The study seems to suggest that a concerted effort should be made by policy makers to enhance educational investment in order to accelerate growth which would engender economic development.

## **INTRODUCTION**

The role of education and human capital in economic growth and development of 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 (Larocque, 2008). Figure 1 depicts the economic effect of education on economic growth. An investment in education is very beneficial in the society, both at the micro level as well as macro level and affects the system both directly and indirectly. Increase in individual's wage is a direct effect while the increasing externalities associated to education are an indirect effect (Dahlin 2005, Heckman and Klenow, 1997 and Michaelowa, 2000). Education is basic to development, and also regarded as the only instrument through which the society can be transformed. As a salient factor in transition programme, education equips human resources with the needed knowledge, skills and competencies, which would make them functional, and contribute to the all-round

development of the nation. It does not only help to supply the essential human capital which is a necessary condition for sustained economic growth but it is a key to poverty reduction and vehicle for promoting equity, fairness and social justice (Okojie, 1995; Yesufu, 2000; Todaro, 2007).

The growing evidence on the role and importance of education in the development process has made social sector investment an important component of national strategies for sustained growth and development. In Nigeria, in terms of budget estimates, the ratio of public expenditure on social and community services to total public expenditure averaged - 12.2 percent between 1980 and 2010. Out of this amount, about 6.5 percent has been directed to education during the same period. Nevertheless, a major trend in education in Nigeria is that investment on the sector has not been encouraging. Public expenditure on education as a percentage of the gross national product was 1.5 (1960); 1.7 (1985-87) and 0.7 (1995) percent. This compares very unfavourably with other developing countries such as Jamaica 4.9 (1985-87), 7.5 (1995-97) and Malawi 3.5 (1985-87), 5.4 (1995-97) percent (UNDP, 2003). In recent times, the percentage of the annual federal government budget to education in Nigeria for the periods 2005-2007 was 6.3%, 7.8%, 8.7% in 2005, 2006, and 2007 respectively instead of 26.0 percent as recommended by the United Nations Educational Scientific and Cultural Organisation (UNESCO). Evidently, there is still a significant shortfall in educational investment necessary for the realization of sustainable growth and development in the country.

The future direction of the macroeconomic policy of investing in educational capital in Nigeria is uncertain. This uncertainty may be attributed to the existence of macroeconomic disequilibrium in financial allocation and unsatisfactory performance of the country's economy in recent times. A review of Nigeria's economic development between 2000 to date revealed that overall macroeconomic policies and development strategies have failed to provide an enabling environment that could alter the structure of production and consumption activities in order to diversify the economic base. The country has continued to be a mono-cultural economy, depending on oil, indicating that the export base is yet to be diversified.

Widening saving investment gap, high rates of inflation, chronic balance of payment problems and underutilization of resources have continued to be the order of the day. Poverty and inequality is wide spread with about 71 million Nigerians living below \$1 a day and the gini coefficient of 0.49. Socio statistics such as infant, under 5, and maternal mortality rate as well as unemployment rate are higher than the averages for developing countries (Fakiyesi and Ajakaiye, 2009). In the light of Nigeria's current economic problems, and particularly its poverty situation and unimpressive rates of economic growth, this paper takes the position that educational development should be given utmost attention in a bid to enhance sustainable economic growth and development. Accordingly, there is however, a need to critically examine the relationship between investment in education and economic growth in Nigeria, with a view to deriving implications for policy direction. This indeed constitutes the major focus of this paper.

The Nigerian government recognized the role of education of human capital in economic development, consequently at independence; it embarked on quantitative and qualitative measures of expansion of educational facilities at all levels. Hence, from 5 universities in 1970, facilities rose to 24 in 1986. As at 2005, the number of educational institutions, namely, primary, secondary and tertiary stood at 59,340; 12,610; and 128 respectively. Similarly, the number of enrolments at the various levels of educational institutions has continued to increase . The adult literacy rate improved from 57 percent to 62 percent between 1997 and 2005.

Table 1 depicts the profile of federal government spending on education between 1980 and 2010. As at 1980 the federal government spent 8.4 percent of total expenditure on education. It rose to 10.4 percent of total expenditure in 1980. It, however, fluctuated significantly between 1985 and 2007. As at 2007 only 8.7 percent of total expenditure was spent on education. This fell below the minimum standard of 26.0 percent of annual budget

prescribed by the United Nations Educational Scientific and Cultural Organisation (UNESCO).

**Table 1: Profile of the Federal Government Spending on Education in Nigeria (1980-2010)**

Year	Percentage Share of Education in Federal Government Expenditure		
	Capital	Recurrent	Total
1980	6.4	4.0	10.4
1983	3.6	6.4	10.0
1985	1.4	5.1	6.5
1990	0.6	3.3	3.8
1995	1.3	3.8	5.1
2000	3.3	6.3	9.6
2005	1.8	4.5	6.3
2007	2.9	5.8	8.7
2010	5.7	2.7	8.4

Source: Calculated by the author based on data from the Central Bank of Nigeria (various issues) *Annual Report and Statement of Accounts*, CBN, Abuja

Several studies have examined empirically the growth-educational capital linkage. Most of these studies are cross-sectional including developing and developed countries and there exists a little literature on the single-country approach. Gylfason and Zoega (2003), examined the impact of gross secondary-school enrolment, public expenditure on education relative to national income and expected years of schooling for girls to the distribution of income as measured by the Gini coefficient as well as to economic growth across countries. The study found that these measures of education are directly related to income equality. It

also finds that more and better education appears to encourage economic growth directly as well as indirectly through increased social equality and cohesion. More and better education financed by public expenditure can encourage economic growth and reduce inequality in the distribution of income as well. The study concludes that education encourages economic growth not only by increasing and improving human capital but also physical and social capital.

In conclusion, the findings from the survey of literature support the notion that education matters for economic growth and development in both the developed and developing countries. However, additional research needs to be conducted to examine the education - growth linkage at the country level in greater detail.

The main objective of this paper is to examine the impact of educational development on sustainable economic growth and development through human capital Education.

#### Hypothesis

Ho: There is a positive relationship between investment in education and economic growth in Nigeria

Hi: There is no positive relationship between investment in education and economic growth in Nigeria.

#### Model Specification

Given the foregoing discussion and relying on previous studies such as Ayara (2003), Mankiw et al (1992), and Pritchett (2001), the following model was employed in an attempt to determine the impact of investment in education on economic growth performance in Nigeria.

$$RGDP = \alpha_0 + \alpha_1 EDUT + \alpha_2 GCF + \alpha_3 LBF + U$$

Where

RGDP - Real gross domestic product

EDUT – Total expenditure on education

GCF - Physical capital formation proxied by gross capital formation

LBF - Labour force

Real gross domestic product is a proxy for economic growth performance while investment in education is proxied by total public expenditure on education. The choice of these proxies is supported by development literature. The a priori expectations are:  $\alpha_1, \alpha_2, \alpha_3, > 0$ . This implies that total public expenditure on education, physical capital formation proxied by gross capital formation and labour force have positive relationship with economic growth. Previous studies like Ayara (2003) employed ordinary least squares approach with data not covering recent estimates. The contribution of this study to knowledge is in terms of the estimation techniques employed and the data used which is extended to 2007. An attempt will be made to empirically investigate the relationship between investment in education and economic growth in Nigeria for the period 1980-2010, using cointegration and error correction techniques. The growth rates of all the variables are used in the study.

The data for the empirical analysis were obtained from various issues of *Annual Reports and Statement of Accounts; Statistical Bulletin* published by the Central Bank of Nigeria, and publications of the Federal Ministry of Education, Nigeria

#### Methodology

The data for the empirical analysis were obtained from various issues of *Annual Reports and Statement of Accounts; Statistical Bulletin* published by the Central Bank of Nigeria, and publications of the Federal Ministry of Education, Nigeria (1980-2010). This section of the paper first identifies and describes the proxies used to represent both the dependent, independent and control variables.

#### Method of Data Analysis

For the purpose of cointegration tests, the paper employs the reduced rank procedure developed by Johansen (1988) and Johansen and Juselius (1990) technique and error correction methodology (ECM). The growth rates of all the variables were used to conduct unit root tests to determine the stationarity of the variables using Augmented Dickey-Fuller (ADF) test.

## Empirical Results And Discussions

### Unit Root Tests

Prior to the estimation of equation (7), the characteristics of the data have to be examined. Testing the stationarity of economic time series is important since standard econometric methodologies assume stationarity in the time series while they are in the real sense non-stationary. Hence the usual statistical tests are likely to be inappropriate and the inferences drawn are likely to be erroneous and misleading. For example, the ordinary least squares (OLS) estimation of regressions in the presence of non-stationary variables gives rise to spurious regressions if the variables are not co integrated (Granger and Newbold, 1974).

The growth rates of all the variables were used to conduct unit root tests to determine the stationarity of the variables using Augmented Dickey-Fuller (ADF) test. The results of the unit root tests are presented in table 3. The results in Table 3 show that all the variables are stationary in their first differences except GLBF, i.e. the growth rate of the labor force.

**Table 3: Results of Unit Roots Tests using Augmented Dickey Fuller (ADF)**

Variables	ADF Statistics with Constant but no linear trend	95% ADF Critical Level	Order of Integration
GrGDP	-11.6066*	-3.7076	I(1)
GEDUT	-5.8576*	3.6959	I(1)
GGCF	-5.1936*	-3.7204	I(1)
GLBF	-4.2092*	-3.6852	I(0)

\*significant at 5 percent level  
 Source: Author's Computation



## Cointegration Test

Having tested the stationarity of each time series, the next step is to search for cointegration between the variables. For this purpose cointegration tests were conducted by using the reduced rank procedure developed by Johansen (1988) and Johansen and Juselius (1990). This method should produce asymptotically optimal estimates since it incorporates a parametric correction for serial correlation. The nature of the estimator means that the estimates are robust to simultaneity bias, and it is robust to departure from normality (Johansen 1995). Johansen method detects a number of cointegrating vectors in non-stationary time series. It allows for hypothesis testing regarding the elements of co-integrating vectors and loading matrix. Johansen procedure is used to determine the rank and to identify long run relationship. The cointegration test results are reported in table 4 below:

As evident in table 4, the dependent variable GRGDP is cointegrated with GGDUT, GGCF, and GLBF. The test statistics strongly reject the null hypothesis of no cointegration in favour of four cointegration relationships between the variables. Thus, the results show that the dependent and independent variables are both cointegrated and have long run relationship with one another.

Furthermore, the short-run adjustment dynamics is specified by the error correction mechanism (ECM). Best fitting or parsimonious error correction model was selected.

**Table 4: Johansen Cointegration Test**

<b>Eigenvalue</b>	<b>Likelihood Ratio</b>	<b>5% Critical Value</b>	<b>1% Critical Value</b>	<b>Hypothesized No of CE(s)</b>
0.6683	70.2808	47.21	54.46	None**
0.4852	40.4849	29.38	35.65	At most**
0.4048	22.5529	15.41	20.04	At most**
0.271	8.5401	3.76	6.65	At most**

\*(\*\*) denotes rejection of the hypothesis at 5% (1%) significance level.  
L.R. test indicates 4 cointegrating equation(s) at 5% significance level.

### **Regression results**

The result of parsimonious error correction model is reported in table 5. The main variable of interest, i.e. the growth rate of educational expenditure has positive and significant effect of economic growth in Nigeria. The coefficient of growth of gross fixed capital formation has positive and statistically significant effect on the Nigerian economy. The coefficient of growth rate of labor force (GLBF) has the correct sign but not statistically significant. The coefficient of the error-correction terms carries the correct sign (negative) and is statistically significant. Hence, the ECM is able to correct any deviations in the relationship between real GDP growth rate and the explanatory variables.

The adjusted  $R^2$  is 77 percent. By implication, this shows 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 20.96 shows that the explanatory variables are important determinants of the GDP growth rate in Nigeria. The Durbin-Watson statistics of 2.3 rules out auto-correlation. These results explain the role of investment in education in Nigeria's development process and corroborate the findings of Babatunde and Adefabi (2005) which indicated a positive relationship between investment in education and long run economic growth in Nigeria. The result of the study does not tally with the findings of Ayara (2003) which suggest that education has not had the expected positive growth impact on economic growth in Nigeria.

**Table 5: Regression Results**

<b>Variables</b>	<b>Estimated Coefficient</b>	<b>t-Statistic</b>	<b>Prob.</b>
D(GEDUT(-1),1)	1.4155	4.2805	0.0004
D(GGCF(-2),1)	2.4509	2.5680	0.0183
D(GLBF(-1),1)	1.3824	0.1986	0.8445
ECM(-1)	-0.6715	-3.7544	0.0012
C	5.6806	0.2145	0.8323
Notes: R-Squared= 0.8074 Adjusted R- Squared=0.7689 F.Statistic = 20.96 D.W. =2.31			

## **5. Summary, Conclusion and Policy Implications**

This paper has provided evidence on the impact of investment in education on economic growth in Nigeria, using the standard growth-accounting model and relying on cointegration and error-correction techniques. The study found that investment in education in Nigeria is quite low and fall below the recommendations of the United Nations. Nevertheless, it is found that investment in education does not only contribute positively to economic growth in Nigeria, but the impact is strong and statistically significant. This, by implication, means that if Nigeria is to achieve sustainable economic growth rate, it is of utmost importance to improve the quality of education and invest heavily in the sector. The study therefore recommends that there is the need to increase budgetary allocation to the educational sector. Government should as a matter of priority implement the minimum United Nations recommendation of 26 percent budgetary allocation to education. The donor agencies like the World Bank, UNDP, UNESCO, etc should also be encouraged to inject funds into the educational sector especially, the tertiary institutions. The government and the private sector must join hands by mobilizing resources to furnish primary, secondary and tertiary educational 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, labour productivity and ensure sustainable growth and development.

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