Education Expenditure and Economic Growth in Nigeria: Granger Causality analysis

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Abstract: This paper analyzes empirically the impact of education expenditure on economic growth in Nigeria over the period of 1981-2010. Cointegration and Granger causality tests are used in order to analyze the causal nexus between education expenditure and economic growth. It is crucial to see the directions of causality between the variables used. It was found that there is cointegration between real growth rate of gross domestic product, total government expenditure on education, recurrent expenditure on education and Primary school enrollment. The result also revealed that there is no causality between real growth rate of gross domestic product (RGDPG) and Total government expenditure on education (TGVTTEE) but there is bi-directional causality between recurrent expenditure on education (REDEXP) and total government expenditure on education (TGVTTEE). Primary school enrollment (PRYSE) does not Granger cause Total government expenditure on education (TGVTTEE), the latter does Granger cause the former. No causality between recurrent expenditure on education (REDEXP) and real growth rate of gross domestic product (RGDPG) and also no causality between Primary school enrollment (PRYSE) and Real Growth Rate of gross domestic product and consequently the study recommends that the government should improve manpower, the quality of life of ordinary Nigerians and teacher education should be given desired attention in order to check the falling standard of education in the country.

Keywords: Education, Cointegration, Causality, Human Capital Development and Economic growth.

INTRODUCTION

Expenditure on education is an investment that can foster economic growth, enhance productivity, contribute to personal and social development and reduce social inequality. The proportion of total financial resources devoted to education is one of the key choices made by governments, enterprises, students and their families. Education in every sense is one of the fundamental factors of development. No country can achieve sustainable economic development without substantial investment in human capital. Education enriches people’s understanding of themselves and world. It improves the quality of their lives and leads to broad social benefits to individuals and society. Education raises people’s productivity and creativity and promotes entrepreneurship and technological advances. In addition it plays a very crucial role in securing economic and social progress and improves income distribution. The well-being of people has traditionally been considered a by-product of growth, rather than the primary objective of economic policy. Therefore, human capital refers to the abilities and skills of human resources; and human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for the economic growth of the country (Harbison, 1962). In other words, what really matters in Nigeria is the empowerment of people and the mobilization of economic surplus into productive investment channels. There is also the need for the Nigerian economy to eliminate or minimize those constraints towards human capital development so as to enhance rapid economic growth (Johnson et al, 2011). However, the major source of per capita output in any country; whether developing or developed, with a market economy or centrally planned is an increase in productivity.

Per capita output growth is however an important component of economic welfare, (Abramowitz, 1981).

Nigeria as a country is immensely endowed in both natural and human resources. The pool of resources from one end to the other is unquantifiable to such extent that, given a dynamic leadership, economic prosperity would have been achieved in late 20th century. The primary focus of Nigeria has been in finding a way to accelerate the growth rate of national income and to engage in structural transformation of her subsistence and resource based economy to a production and consumption based economy in order to break the cycle of poverty, low productivity and stagnation (Ibid, 2011). In spite of all these abundant resources, Nigeria has failed to realize her full development potential with the topmost priority currently given to sustainable human capital development or people oriented development by many countries and multilateral organizations, e.g. UNDP. A review of the Nigerian economy has become quite appropriate as a way of understanding more comprehensively her human capital development.

More so, education is an age long phenomenon in all societies although it may take various forms from one society to another. In Nigeria; two forms of education were in existence before the advent of colonialism. They were indigenous education and Islamic education. Traditional education as was practiced in the southern and some parts of the middle belt of Nigeria, consisted essentially of general but informal training in character, norms, agriculture, fishing, intellectual and other ways of life as approved by society. Islamic education on the other hand was practiced mainly in Northern part of Nigeria. It is based on the Quran. Both forms of education preceded the Western education which was introduced to Nigeria in the 19th century by the
European Christian missionaries. The advent of colonialism brought about formal education in Nigeria. The colonialists had to organize the training of the indigenous people to understand the Queen’s language. The Christian missionaries organized schools and trained Nigerians in the art of reading and writing. The initial persons that were trained in the communities became the first indigenous persons to be employed by the colonial government as interpreters, clerks and teachers (Omojimete, 2010). It did not take long before the benefits of formal western education became manifest in Nigeria. The regional governments of independent Nigeria expanded educational opportunities, building more schools and providing grant-in-aid to missionary schools in their respective regions especially in the southern regions. Expanded educational facilities were seen as the panacea to the manpower needs and overall development in post-colonial Nigeria.

Furthermore, one of the major challenges facing Nigeria’s education system is inadequate qualified manpower, inadequate basic infrastructure, overcrowded classrooms, inadequate learning and teaching materials and teacher incompetency among others. This could explain the much talked-about falling standards of education. In this regard teacher education should be given desired attention in order to check the falling standard of education in the country. However, in Nigeria the rate of illiteracy is very high. Most of the workers are unskilled and they make use of outmoded capital equipments and methods of production. Therefore, their marginal productivity is extremely low and this leads to low real income, low savings, low investment and above all low rate of capital formation. It was indicated that in 2008 adult literacy rate of at least 65% was attained. The obvious research questions were i) Why is the growth of GDP not reflective on government expenditure on education in Nigeria? ii) Does education expenditure have any significant impact on economic growth in Nigeria? The broad context for the research lies in examining the impact of education expenditure on the growth of the Nigerian economy. The specific objectives are as follows: to examine why government expenditure on education rises and GDP does not rise commensurately and to examine whether or not education expenditure has any significant impact on economic growth in Nigeria.

This research is aimed at finding out the impact of education expenditure on the Nigerian economic growth. The significance of the study is further amplified by the slow rate of Nigeria’s economic growth despite the huge contribution of the government. Researches on this topic being carried out over the years have not really achieved its prior objective. The impact of education on economic growth holds a lot of benefits to our overall economic progress. The government and its agencies will find this work resourceful in formulating policy directives and regulations for human capital development to aid economic growth. It will also contribute to existing literature on the subject matter by analyzing empirically the role played by education on economic growth and development of the country.

**LITERATURE REVIEW**

Dorian (1997) employing a neoclassical framework estimated a structural growth model in which he included education and health as explanatory variables. The study found a positive relationship between economic growth and health. The relationship between education and economic growth was found to be insignificant. Ramirez et al (1997) employing cross country data investigated the channels through which human capital development affects economic growth and vice versa. The study argues that economic growth may lead to human capital development and human capital development could also lead to economic growth. This bi-directional relationship could lead to virtuous or vicious cycles of economic growth. The study finds that countries which promoted economic growth tend to achieve the vicious category while countries which favoured human capital development encounter the virtuous growth. Omotor (2004) analyzed the determinants of federal government expenditures in the education sector in Nigeria using the ordinary least squares (OLS) methods. The study revealed that the trend in education expenditure in Nigeria is unstable which reflects the instability in government earning.

Government revenue was the only significant determinant of education expenditures as revealed by the results of the regression. The study recommends a diversification of the sources of funding education so as to reverse the unstable trend in that sector. Aigbokhan et al (2005) analyzed the impact of education expenditures on human capital development. The study used historical data to establish the correlation between public education expenditure and human capital development in Nigeria and noted that insufficient and uncertain budgetary allocations to education have resulted in the deterioration of its impact on human capital development. Education spending as percentages of annual budgets were low and unstable during the period studied. The study did not analyze the channels through which education expenditure impact on human capital development. Owoeye and Adenuga (2005) investigated the relationship between expenditures on education and health, and economic growth. The study estimated a parsimonious error correction model and found that expenditures on education impacts positively on economic growth. The study recommended that more resources should be channelled towards the level of education where the benefits are higher for the individual and the society at large. The study did not investigate the direction of the link between educational expenditures and economic growth.

Adebiyi and Oladele (2005) empirically investigated the relationship between public education expenditure and defense spending in Nigeria. The study employed the error correction mechanism and the vector autoregressive (VAR) models and found a negative trade – off between defense spending and public education expenditure. Analysis of the impulse response functions derived from the VAR model reveals that past public education expenditure shocks has a positive but declining relationship with current public education expenditure in the first two years after which it turns negative. Also the impulse responses show that increase in defense spending will increase public expenditure available for education in the short-run. The
study did not examine the causal link between the various levels of education and economic growth. Loening (2005) examined the relationship between human capital development and economic growth using data from Guatemala and found that a better educated labour force appears to have a positive impact on output growth. Babatunde and Adefabi (2005) examined the long-run relationship between education and economic growth in Nigeria using the Johansen co-integration approach as a framework of analysis. The results of the co-integrating technique suggest that there is a long-run relationship between enrolments in primary and tertiary levels of education and the average years of schooling with output per worker. The study concluded that a well-educated labour force possessed a positive and significant impact on economic growth through factor accumulation and on the evolution of total factor productivity.

THEORETICAL REVIEW

a. Human capital theory: This is a modern extension of Adam Smith's explanation of wage differentials by the so-called net (dis)advantages between different employments. The costs of learning the job are a very important component of net advantage and have led economists such as Gary S. Becker and Jacob Mincer to claim that, other things being equal, personal incomes vary according to the amount of investment in human capital; that is, the education and training undertaken by individuals or groups of workers. A further expectation is that widespread investment in human capital creates in the labour-force the skill-base indispensable for economic growth. The survival of the human-capital reservoir was said, for example, to explain the rapid reconstruction achieved by the defeated powers of the Second World War. Human capital arises out of any activity able to raise individual worker productivity. In practice full-time education is, too readily, taken as the principal example. For workers, investment in human capital involves both direct costs, and costs in foregone earnings. Workers making the investment decisions compare the attractiveness of alternative future income and consumption streams, some of which offer enhanced future income, in exchange for higher present training costs and deferred consumption. Returns on societal investment in human capital may in principle be calculated in an analogous way. Also, human capital theory views schooling and training as investment in skills and competences (Schultz, 1960 and 1961). It is argued that based on national expectation of return on investment, individuals make decisions on the education and training they receive as a way of augmenting their productivity.

b. Modernization theory: is a theory that is used to explain the process of modernization within societies. Modernization refers to a model of a progressive transition from a 'pre-modern' or 'traditional' to a 'modern' society. The theory looks at the internal factors of a country while assuming that, with assistance, "traditional" countries can be brought to development in the same manner more developed countries have. Modernization theory attempts to identify the social variables that contribute to social progress and development of societies, and seeks to explain the process of social evolution. Modernization theory not only stresses the process of change, but also the responses to that change. It also looks at internal dynamics while referring to social and cultural structures and the adaptation of new technologies. This theory also focuses on how education transforms an individual’s value, belief and behavior. Exposure to modernization institutions such as schools, factories, and mass media inculcate modern values and attitudes. The attitude include openness to new idea, independences from traditional authorities, willingness to plan and calculate further exigencies and growing sense of personal and social efficacy.

METHODOLOGY

The study adopts multiple regression econometrics technique using Granger causality test to analyze the causal links between expenditure in education and economic growth. The study covered the period between 1981 and 2010. Secondary data on RGDGP, TGVEE, REDEXP and PRYSE were used in the study and were obtained from both local and international agencies from human development data. Such agencies include the Central Bank of Nigeria (CBN), and the World Bank.

Model Specification:

In order to investigate the impact and direction of causation between education expenditure and economic growth, Vector Error Correction Model (VECM) was employed in the estimation of the parameters due to its superiority to Ordinary Least Square (OLS) method. The functional form of the model is thus specified:

\[
\text{LOGRGDPG}_t = \beta_0 + \beta_1 \text{LOGTGVTEE} + \beta_2 \text{LOGREDEXP} + \beta_3 \text{LOGPRYSE} + \mu_t \\
\]

Where,

RGDPG = Real Growth Rate of gross domestic product
TGVTEE = Total government expenditure on education
REDEXP = Recurrent Expenditure on Education
PRYSE = Primary school enrolment

\(\beta_0, \beta_1, \beta_2, \text{ and } \beta_3 \) = Constants

\(\mu = \) Stochastic error term
\(t = \) Time

A priori Expectation:

\(\beta_0, \beta_1, \beta_2, \beta_3, \beta_4 \leq 0\)

RESULTS
The data set was estimated using E-views econometric package. Granger-Causality test and Unit root test were carried out to ensure that the data set was stationary and to avoid autocorrelation problem among the variables.

Table 1: Diagnostic Stationarity (ADF) Test Result for the variables used in the Study

<table>
<thead>
<tr>
<th>Test Statistics</th>
<th>Variables</th>
<th>Intercept</th>
<th>Trend &amp; Intercept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>RGDPG</td>
<td>-4.497852 (0) **</td>
<td>-3.665005 (2)**</td>
</tr>
<tr>
<td></td>
<td>TGVTEE</td>
<td>4.303865 (1)</td>
<td>2.005625 (7)</td>
</tr>
<tr>
<td></td>
<td>REDEXP</td>
<td>3.233741(2)</td>
<td>-0.298774 (1)</td>
</tr>
<tr>
<td></td>
<td>PRYSE</td>
<td>-1.148339(0)</td>
<td>-2.591934(0)</td>
</tr>
<tr>
<td>First Difference</td>
<td>ARGDGP</td>
<td>-5.946932 (2)**</td>
<td>-5.806379 (2)**</td>
</tr>
<tr>
<td></td>
<td>ATGVTEE</td>
<td>0.700797 (7)</td>
<td>-9.844648 (7)**</td>
</tr>
<tr>
<td></td>
<td>AREDEXP</td>
<td>-7.894705(0)**</td>
<td>-5.939135 (1)**</td>
</tr>
<tr>
<td></td>
<td>APRYSE</td>
<td>-7.019421(0)**</td>
<td>-6.898882(0)**</td>
</tr>
</tbody>
</table>

Key: *** Stationary @ 1%
** Stationary @ 5%
* Stationary @ 10%

Asterisks (**) shows significance level at 5%. Figures in parentheses indicate the lag length. ADF test examines the null hypothesis of a unit root against the stationary alternative.

From the above table some of the variables are stationary at level I(0) and the rest at first difference I(1) i.e. the variables are integrated in the same order. With this result, we now proceed to test the long run relationship between the variables using two co-integration techniques that were devised by Johansen and Juselius (JJ) (1990). In the JJ method, two tests are used for the determination of the number of co-integrating vectors, the maximum eigenvalue test and the trace test. The result of cointegration test is presented in table 2 below.

Table 2: Johansen Cointegration Test

<table>
<thead>
<tr>
<th>Trace Test</th>
<th>Max-Eigenvalue Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesized No. of CE(s)</td>
<td>Eigenvalue</td>
</tr>
<tr>
<td>None *</td>
<td>0.721008</td>
</tr>
<tr>
<td>At most 1 *</td>
<td>0.676745</td>
</tr>
<tr>
<td>At most 2</td>
<td>0.392644</td>
</tr>
<tr>
<td>At most 3</td>
<td>0.002567</td>
</tr>
</tbody>
</table>

* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

From the above Table2; Trace test and Max-eigenvalue test indicates 2 cointegrating con (s) at the 0.05 level, the trace statistic of 81.4 is greater than 5% critical value of 47.9. Hence we reject the null hypothesis and accept the alternative hypothesis that there is cointegration. Also looking at trace statistic of 45.7 is greater than 5% critical value of 29.8 meaning that there is one cointegration between the variables.

Furthermore, the Max-Eigen statistic of 35.7 is well above 5% critical value of 27.6 therefore, we reject the null hypothesis and accept the alternative hypothesis that there is cointegration between the variables. Also looking at Max-Eigen statistic of 31.6 is greater than 5% critical value of 21.1 which also implies that there is one cointegration between the variables.

Having established the fact that the variables are cointegrated i.e. the variables have long run relationship. Since the variables are cointegrated we can now proceed to test the direction of causality using Vector Error Correction Model (VECM) which implies that the presence of cointegrating vector allows for the use of VECM to test causality between the variables. The result of pairwise Granger Causality is presented in Table 3 below; the lag length adopted for the analysis is 7. This is informed by the fact that the structure of the Nigeria’s education system is 6 years (6-3-3-4 System) and therefore it will take an average of six or more years before a child who went to school would contribute to income growth in Nigeria.

Table 3: Pair wise Granger Causality test

<table>
<thead>
<tr>
<th>Null Hypothesis:</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>RGDPG does not Granger Cause TGVTEE</td>
<td>23</td>
<td>0.24714</td>
<td>0.9592</td>
<td>No causality</td>
</tr>
<tr>
<td>TGVTEE does not Granger Cause RGDPG</td>
<td></td>
<td>0.75750</td>
<td>0.6364</td>
<td></td>
</tr>
<tr>
<td>REDEXP does not Granger Cause TGVTEE</td>
<td>23</td>
<td>7.70294</td>
<td>0.0050</td>
<td>Bi-directional causality exists</td>
</tr>
<tr>
<td>TGVTEE does not Granger Cause REDEXP</td>
<td></td>
<td>13.2606</td>
<td>0.0008</td>
<td></td>
</tr>
<tr>
<td>PRYSE does not Granger Cause TGVTEE</td>
<td>23</td>
<td>2.51195</td>
<td>0.1102</td>
<td>Uni-directional causality</td>
</tr>
<tr>
<td>TGVTEE does not Granger Cause PRYSE</td>
<td></td>
<td>3.60391</td>
<td>0.0464</td>
<td></td>
</tr>
<tr>
<td>REDEXP does not Granger Cause RGDPG</td>
<td>23</td>
<td>1.53237</td>
<td>0.2806</td>
<td>No causality</td>
</tr>
<tr>
<td>RGDPG does not Granger Cause REDEXP</td>
<td></td>
<td>0.25099</td>
<td>0.9576</td>
<td></td>
</tr>
<tr>
<td>PRYSE does not Granger Cause RGDPG</td>
<td>23</td>
<td>0.72967</td>
<td>0.6546</td>
<td>No causality</td>
</tr>
<tr>
<td>RGDPG does not Granger Cause PRYSE</td>
<td></td>
<td>1.15602</td>
<td>0.4175</td>
<td></td>
</tr>
</tbody>
</table>
From the above table, it can be seen that there is no causality between Real Growth Rate of gross domestic product (RGDGP) and Total government expenditure on education (TGVTEE) but there is bi-directional causality between Recurrent Expenditure on Education (REDEXP) and Total government expenditure on education (TGVTEE). We can observe that while PRYSE does not Granger cause Total government expenditure on education(TGVTEE), the latter does Granger cause the former. No causality between Recurrent Expenditure on Education (REDEXP) and Real Growth Rate of gross domestic product (RGDGP); this is because according to Education For All (EFA) Monitoring Team report, an estimated 61 million children of primary school age do not have access to education globally. Nigeria alone is home to an estimated 10.5 million out-of-school children in 2012, 3.6 million more than in 2000, or 42 percent of the primary school-age population. In essence 17.21% of out-of-school children in the world are Nigerians. In another light, one in every six out-of-school children is a Nigerian. Similarly, 6 million of 36 million girls out-of-school world-wide are Nigerians.

Furthermore, another issue is poor funding which has been recurrent. For instance; the fiscal plan allocated for education was 8.53% in 2012 and UNESCO recommended 26%. So out of it, 82 per cent was allotted to recurrent expenditure while 18 per cent was allotted to capital expenditure. And due to lack of funding infrastructure in most primary schools has deteriorated. Students sit on the floor; lack textbooks and other relevant learning materials; leaky roofs; poor toilet facilities; inadequate water supply; etc. Also early marriages practiced mostly in northern Nigeria reduces girl child enrollment into schools particularly in the rural areas. And there is bi-directional causality between Primary school enrolment (PRYSE) and Recurrent Expenditure on Education (REDEXP).

CONCLUSIONS

The importance of education cannot be over emphasized because education contributes to the development of any country and the best legacy a country can give to her citizens. According to Igbuzor (2006) education is a human right that should be accorded to all human beings solely by reason of being human. Therefore, Granger causality test on the basis of the error correction mechanism was used to test the direction of causality between the variables. The result of the test showed the evidence of cointegration. Primary school enrollment does not Granger-cause economic growth as revealed by the results; this is not surprising because of the security situation in Nigeria especially constant threat posed by Boko Haram which started in 2009, and they have carried out several attacks and threats on primary schools in northern Nigeria. In some of the attacks, teachers were injured or even killed and structures razed which makes parents to stop sending their children to school out of fear and this reduces the number of students enrolled in schools.

RECOMMENDATIONS

It is important to provide a set of policy recommendations that will be applicable to the Nigerian education system and the economy too.

To address the issue of insecurity in Nigeria government should try as much as possible to improve the quality of life of ordinary Nigerians which includes providing quality and functional schools, good infrastructure; also defense skills and military training should be included in the curriculum of schools. Early marriages should be discouraged especially in northern Nigeria and by doing so girl child enrollment into schools will increase substantially. In the process of budgeting and planning, the government should improve manpower and make provision for facilities that will build up the skills of the students. Technically, this will increase the interest of the students and provide conducive atmosphere for learning. Lastly, poor ratings of education in Nigeria can be reduced by not only government intervention but by the intervention of rich individuals, organizations and groups. To solve the problem of teacher incompetency, teacher education should be given desired attention in order to check the falling standard of education in the country.

REFERENCES


