The Impact of Educational Expenditure on Economic Growth in Nigeria: An Error Correction Specification

I.R. Irughe

Department of Economics, Adeyemi College of Education, Ondo, Ondo State, Nigeria

Abstract: Education has been viewed by many as a tool for national transformation. Notwithstanding, the realization of this fact is not so clear going by the number factors militating against this all important sector. It is against this backdrop that this study empirically examines the impact of education expenditure on economic growth in Nigeria. Data for the study were extracted from the CBN statistically Bulletin from 1977-2009. The study employed the error correction modeling technique and a geometric method of analyses. The study revealed that education expenditure had significantly negative effect on growth. It was also discovered that the education expenditure in Nigeria followed a dwindling pattern. Based on the findings, it was recommended that public expenditure on education maintains an upward budgetary allocation that is consistent.

Key words: Education expenditure, budgetary allocation, economic growth, error correction technique, CBN

INTRODUCTION

Formal education in Nigeria dates back to the 18th century when the European Missionaries visited Nigeria. Although before this time, it cannot be said that the people of Nigeria lacked education but that the type of education was indigenous where community members who possess special skills or abilities in different fields pass on to others in an informal way. Aliu (1997) maintained that education at this time was regarded as a fundamental importance to the spread of Christianity. Thus, the missionaries established schools and designed the curriculum for such schools and devoted their resources to the opening of schools for young Nigerians. This time according to Adeyegbe, control and management of education was solely borne by the missionaries until 1882 when the government of Nigeria took a bold step to promulgate codes and regulations guidelines as well as policies on the overall organization and management of schools and thus making grants available to schools to ensure quality and also appointing inspectors.

The previous underscores the involvement of government in educational expenditure, management and control. This is not unconnected to government realization of the fact that education was a light that illuminates a people from darkness. Anyanwu *et al.* (1997) as quoted by Okojie (2003) defined education as any process by which an individual gains knowledge or insight or develops attitudes and skills. Human resources when developed can ultimately determine the character and pace of its economic and social development.

An inquiry into the fiscal responsibilities and development of Nigeria show that the Federal Government expenditure on education is classified under the social and community service, this implies that education is basically an impure public good (Orubu, 1989). Education does not only entail acquiring skills and knowledge but learning the right attitudes for performing social and economic responsibilities, social integration improve personal competence, acquiring formal qualification for pursuing further education and seeking better employment opportunity. The importance of education is inherent in its role as a means of understanding, controlling, altering and redesigning of human environment (Central Bank of Nigeria, 2000). Education improves health productivity and access to paid employment (Anyanwu *et al.*, 1997). Education has a direct relationship with a country's economic development. The expectations and performances of an economy are directly tied to its trend of educational expenditure.

In Nigeria over the years, the demand for formal education has been on the increase. This is due to the fact that education is a key for economic liberation and on the realization of this claim it has been spreading like bush fire in countries of the world. Education is termed a right and responsibility to be guaranteed to all generations and that is the main reason most developing economies have made it a paramount objective in widening access to education specifically access to basic education. This is as a result of the fact that education is capable of creating the indigenous capacity for propelling national growth and development.

Enrolment in primary, post primary and tertiary institutions have risen tremendously. For instance, primary schools increased from 15,703 in 1960 to 39,677 in 1995, this is >100% increase. By 1996-1997 academic session, the number of primary schools had increased to 40,204 with enrollment of 15,535,878 and students turn over of 2,154,718 (Okojie, 2003). These figures have been on the increase over the years. Same are the cases of secondary and tertiary schools with an unprecedented increase without a corresponding increase in its sectoral expenditure. Records revealed that public expenditure on education have been dwindling rather than maintaining an upward increase in view of Nigeria's ever increasing population and the clarion call for its role in alleviating poverty. For instance, the Nigeria total expenditure on education as a percentage of Federal Government total expenditure stood at 2.4% in 1977 jumped to 10.4% in 1986 despite little increase in the preceding years. It later dropped drastically to 5.4%, 10 years after and 5.5% in 2006. This is a contrast from the UNESCO recommended 26%.

From this discussion, it is obvious that government expenditure on the educational sector has been unstable and unpredictable having realized the place of education in national development vis-a-vis combating poverty. With this pattern of fluctuations in Nigeria's educational expenditure, the multiplier effect will be enormous which has resulted into humiliating characteristics in the sector. Today, many schools suffer from overcrowding poor sanitation, poor management and poor intra-sectoral allocation. Other characteristics are abandoned capital projects, inadequate funding and poor conditions of service among others. All these have resulted into closure of schools and industrial strikes which paralyzes academic activities. The results are poor quality of teaching and poor quality of products.

It is against this backdrop that the kernel of this study is premised. This study is categorically aimed at investigating the trend of government expenditure to the education sector and its growth effect in Nigeria. This present study deviate from previous studies as it covers a larger time series and employed a different methodology.

Literature review: The development of human capital has been recognized by development planners as an essential pre-condition for a country's economic, political and socio-cultural transformation (Awopegba, 2003). Human capital is thus an inestimable asset that needs to be properly mobilized and developed so much so that it can meaningfully be involved in the development efforts of a nation. Interestingly, education and training are essentially the processes by which skills, knowledge and attitudes are learnt for performing social and economic responsibilities, social integration, improving personal competence, acquiring formal qualification for pursuing further education and seeking better employment opportunities (Awopegba, 2003). In the words of Adamu (2003), he opined that human capital formation transcends mere acquisition of intellectual ability through formal education system. It has to do with the transformation of the total man to enhance his productivity. Aigbokhan puts it that human capital investment is an indispensable component of the development process it is a force that can help in tackling inequalities and poverty in any nation.

Harbison (1964) opined that a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy will be unable to develop anything. Again, Harbison emphasized further when he examined the role of education in nation building that:

> Human resources... not capital nor income, nor resources-constitute the ultimate basis for the wealth of nations. Capital and national resources are passive factors of production: human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organizations and carry forward national development

Developing human capital is demonstrated in its expenditure in education which is viewed as a tool for human capital transformation. However, attempt is made here to critically and empirically appraise the correlation (if any) of education expenditure and human capital development.

Firstly, according to the human development report of the UNDP (1996) countries that invested heavily in the development of human capabilities in areas, such as education, health and technical education experience high productivity at the organizational and national levels and thus will improve significantly. Reportedly, the Republic of Korea then invested as high as $160/person/year in education and health while Malaysia invested $150. These figures were in contrast with countries, such as India with $14, Pakistan $10 and Bangladesh $5/person/year. Today, the economy of Korea and Malaysia in development are equally in contrast with the likes mentioned before.

Again, a World Bank report cited in Awopegba (2003) revealed that the most important factor that launched the East Asian countries (otherwise referred to as East Asian miracle) on the path of rapid and sustained economic growth was the universal or near universal primary

schooling. Thus, this gave these countries advantages over other countries. For instance, Korea and Pakistan had similar levels of income in 1960. While Korea had nearly all the children of primary school age in school during this same period, Pakistan had only a third of the children enrolled in school. In later years, precisely 1985, Korea's GDP per capita was nearly three times that of Pakistan.

The World Bank reports concluded that a plausible explanation for this situation is the opportunities education offered its recipients and this includes the expansion of the capacity to make better use of technology and inputs ability to generate and utilize new information for effective national economic management and better adaptation to changing socio-economic senarios.

A research done by Babatunde and Adefabi (2005) on the long run relationship between education and economic growth in Nigeria using evidence from the Johansen's co-integration approach for the period 1970- 2003 examined two 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. Their findings observed that though it may be difficult to separate the two channels from each other the result revealed that a well educated labour force possessed a positive and significant impact on economic growth through factor accumulation and on the evolution of total productivity. Thus, a good performance of an economy in terms of per capital growth may therefore be attributed to a well-developed human capital base. Concluding the study, the researchers recommended that concerted efforts should be made by policy makers to increase the level of human capital in Nigeria.

Bratti *et al.* (2004) estimated a model of economic growth and human capital accumulation on a simple of countries at a different stage of development. In their findings, it was revealed that the increases in the primary and secondary level of education contributes to an increase in productivity. They further posited that human capital accumulation rates are affected by demographic and geographic variables. In their study, they established that an increase in life expectancy at birth brings about an increase in secondary and tertiary education while a decrease in the juvenile dependency rate affects secondary education negatively. Also in a research done by Buffie (1994), in a cross-country study researched into the effects of reducing human capital expenditure in his model distinguishing between skilled and unskilled labour in manufacturing sector. He assumed that skilled labour growth is governed entirely by human capital investment of the government and the stock of skilled labour is fixed in the short-run and thus rises or falls over time depending on whether the public investment on human capital is positive or negative. His findings showed that the investment on human capital formation leads to capital accumulation on a broad front. Given that factors are usually complementary, a lower supply of skilled labour (or social infrastructure) reduce the productivity of both capital and unskilled labour. This finding brings to bear that the most obvious way of developing human capital is formal education.

Elsewhere, Musila and Belassi (2004) examined the impact of education expenditures on economic growth in Uganda using evidence from the Time Series Data for the period 1965-1999. The study adopted the use of co-integration and error estimation procedures using capital and labour as some of the key variables that seems to affect the long run growth performance of the economy. However, the result indicated that average education expenditure per worker is positively correlated with economic growth. The LR tests also indicate that education expenditures in the model are weakly exogenous, suggesting therefore that they drive economic growth. The researchers added that based on their findings, the policy advice given to the Ugandan authority by the international donor community to increase education expenditures in order to improve the economy's growth performance is considered economically sound.

Other researchers such as Barro (1991) finds a positive correlation between education expenditures and economic growth. Gyimah-Brempong (1998) used a simultaneous equation models and panel data to access military spending and expenditure on social services. The study revealed that there is a trade off between military spending and the expenditures on social services including investment in physical and human capital. Romer (1990) assumes that the creation of new ideas is a direct function of human capital which manifests in the form of knowledge. As a result investment in human capital led to growth in physical capital which in turn leads to economic growth.

Griffin and McKinley (1992) opined that human capital development is a growth and development strategy intended to improve the well being of people in a short time as possible. The researchers believed that implementing the 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 a minimum.

MATERIALS AND METHODS

Theoretical framework: Following the research of Musila and Belassi (2004) in which the Cobb Douglas form of production function with an inclusion of education expenditure was given as:

$$Y_t = AK_t^{\alpha} L_t^{\beta} H_t^{\gamma} \qquad (1)$$

Where:
Y_t	=	The real income (i.e., real GDP)
K_t	=	Physical capital
A	=	The technology parameter
t	=	The observation
α, β and γ	=	The parameters to be estimated

Human capital is defined as follows:

$$H_t = E_t L_t \qquad (2)$$

where, E_t is the average level of education per worker. In the study, it is assumed that the average level of education per worker is directly proportional to the average expenditure on education per worker. Substituting Eq. 2 into 1 obtains:

$$Yt = AK_t^{\alpha} L_t^{\delta} E_t^{\gamma} \qquad (3)$$

where, $\delta = (\beta + \gamma)$ it is from Eq. 3 that the econometric equation was developed to empirically assess the impact of government education expenditures on economic growth. Theoretically, a positive correlation is expected between growth in output on one hand and increases in capital stock, population and education of workers on the other hand.

Model specification: However, based on the framework this study presents an empirical model as follows:

$$RGDP = F(EDU, KST, POP) \qquad (4)$$

$$RGDP = \alpha_o + \alpha_1 EDU_t + \alpha_2 KST_t + \alpha_3 POP_t + U_t \qquad (5)$$

Where:
RGDP	=	Economic growth rate
EDU	=	Education expenditure
KST	=	Capital stock
POP	=	Population
U	=	Stochastic error term
α_o	=	Intercept
α_1-α_3	=	Coefficient
t	=	End of period

Method of analysis and data collection procedure: This study employs error correction model to examine education expenditure on economic growth. The secondary source of data was used for this study. Specifically, data for this study were obtained from the Central Bank of Nigeria (CBN) statistical Bulletin (various issues) from 1977-2009.

RESULTS AND DISCUSSION

Trend analysis of capital and total public expenditure on education: In this study, an attempt was made to geometrically examine the trend of government expenditure on education (capital and the total expenditure) in comparism with the UNESCO baseline of 26% budgetary allocation to the education sector as shown in Fig. 1.

Figure 1 reveals capital expenditure on education as a percentage of government total capital expenditure for the years 1977-2007. In 1977, the share of capital expenditure on education was only 2.2% moving to 3.0% in 1980 and dwindling between 3.0-0.8% in 1986 and 1992, respectively. Similarly, it stood at 2.5% in 2000 and fluctuated between 1.0 and 1.8% in 2002 and 2007, respectively.

In the same vein, government overall commitment was also revealed as shown before were education expenditure as a percentage of total public expenditure ranging from 2.4% in 1977, 3.9% in 1982 rose to 10.4% in 1986 its peak. Again, it started dwindling and experiencing fluctuations. It stood at 0.8, 5.0 and 5.5% in 1989, 1999 and 2006, respectively. Given the above, it becomes more vivid that the character of the Federal Government of Nigeria with respect to sectoral allocation to education has been low, fluctuating and above all unstable. With the continuous increase in the demand for formal education which has been considered a sine
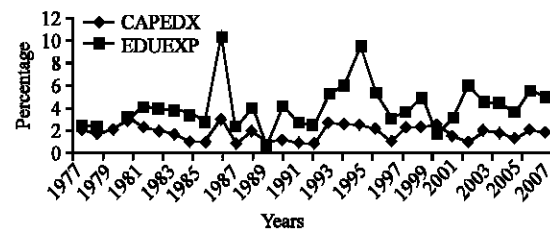

Fig. 1: Education expenditure as share of public expenditure. CAPEDX represents capital expenditure on education as share of total government capital expenditure. EDUEXP represents total education expenditure as a share of total government expenditure

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qua non to economic growth government spending on education both in recurrent and capital expenditures have been dwindling instead of maintaining an increasing proportion of its annual budgets. Since, human beings are the agents to be developed and education as the main instrument for achieving this then considering government commitment to education sector in Nigeria, one may possibly conclude that enough is not been made for such an agent to be able to bring the desired change capable of stimulating economic growth. Umo (1995) observed that in Nigeria, education investment has grown at a phenomenal rate at the time that the economy is experiencing dynamic structural shifts due mainly to the emergence of oil sector as the main propeller of growth. Examining the trend of government expenditure to this all important sector, the views of Albrecht and Ziderman (1993) come to play where they asserted that government resources allocated to education sector, especially to higher education did not keep pace with the expansion.

The implications of government unstable and fluctuating sectoral allocations manifests in different folds such as over-crowding in schools at all levels, abandoned capital projects, infrastructural decay, inadequate and up to date laboratories/libraries, poor conditions of service, producing half baked graduates and the very common ones-strikes and closures. Again, Umo (2007) noted that without high quality, producing half-baked graduates can be more dangerous than not educating them at all. The researcher continued that quality comes at a high price that Nigeria should stand ready to pay because its economic fundamentals can absorb this.

Unit test result: In attempt to examine the stationarity status of the variables, researchers explored the Dickey Fuller (DF) and Augmented Dickey Fuller (ADF) unit root test in Table 1.

Table 1 shows the variables were all non-stationary at levels and were differenced. The Dickey Fuller test both

without and with linear trends indicates that they became stationary only after first difference except for variable RGDP became stationary after second difference. This implies that all the variables are of order (1) except for RGDP that was order (2).

Table 2 shows the Augmented Dickey Fuller Level Root Test result. The test result shows that RGDP and capital were only stationary at order (2) while edu and pop were stationary at order (1). This is an indication of the fact that they were all non-stationary that were made stationary in the above order shown in the remark. This is shown by both ADF test without trend and with linear trend.

Co-integration test result: Due to the establishment of liner root problem associated with the variables, researchers then proceed to ascertain whether a long run relationship exist among them. This is done by a co-integration test specifically the engle granger residual based co-integration test (Table 3).

The co-integration test result shows in Table 4 that the variables were not co-integrated based on the OLS regression of DRGDP on: INPT, DEDU, DKST, DPOP. This is an indication of the fact that a long run relationship is not established in that order.

Table 4 shows that a computation only established by a second difference of the variable. It implies that they were co-integrated at order (2). Based on the establishment of a long run relationship, researchers then proceed to estimate the error correction model.

Error correction model result: The error correction representation for the selected ARDL model (1,2,2,1) selected based on R-BAR square criterion is presented as:

R^2 = 0.77
R^{-2} = 0.62
Dw- statistics = 1.94
F-statistics (6,17) = 7.75*

Table 1: Dickey Fuller unit root test result

Variables	DF statistic (without a trend)	DF statistics (with linear trend)	Rmk
DDRGDP	-7.6041 (-2.9907)	-6.87170 (-3.6119)	1(2)
DEDU	-6.7986 (-2.9750)	-8.26350 (-3.5867)	I(1)
DKST	-2.7547 (-2.9798)	-4.53337 (-3.5943)	I(1)
DPOP	-4.0388 (-2.9798)	-4.04330 (-3.5943)	I(1)

( ) Indicates critical values at 95% level of significance

Table 2: Augment Dickey Fuller unit test result

Variables	ADF (1) without trend	ADP (l) with trend	ADF (2) without trend	ADP (2) with trend	Rmk
DDRGDP	-3.9115*	-3.8080*	-3.9309	-3.8165*	1(2)
DDKST	-13.9801*	-15.8858	-3.2178*	-4.0345*	1(2)
DEDU	-3.2949*	-4.7574*	-2.2828	-4.2104*	I(1)
DPOP	-3.1050*	-3.1199	-3.6272*	-3.7140*	I(1)

*Significant at 5%

Table 3: Co-integration test result (Based on OLS regression of DRGDP IN on: INPT DEDU DKST DPOP)

DF	ADF (l)	Rmk
-3.4687	-3.0595	Non-stationary
(-4.5852)	(-4.5852)	

Table 4: Co-integrated based on the OLS regression of DRGDP on: INPT, DEDU, DKST, DPOP

DF	ADF(l)	Rmk
-5.1945(4.6079)	-3.2243(-4.6099)	Stationary

( ) indicates critical values

Table 5: Error correction result (Dependent variable dDRGDP)

Regressor	Coefficient	t ratios
dDEDU	-0.547	2.4541*
dDEDU(-1)	-1.090	-2.5900*
dDKST	-0.023	-0.8500
dDKST(-1)	-0.110	-1.5200**
dDPOP	618.050	0.6700
dINPT	4752.000	1.4700
ecm(-1)	-0.720	-3.0700*

*Significant at 1%; **Significant at 10%

A cursory look at Table 5 shows that about 62% of the variation in real GDP is explained by the independent variable. The F-statistics value of 7.75 which is significant at 1% level also shows that there is a considerable harmony between the real GDP and the explanatory variables put together. The DW-statistics of 1.94 revealed the absence of serial correlation association with this regression result.

A closer look at the result indicates that education expenditure has negative and significant effect on growth in Nigeria. This result is not surprising as education expenditure in Nigeria has not only dwindled but has been minimal and this has serious implications for the quality of manpower, thus having implication on growth. Population was found to have positive impact on growth though not significant while capital stock has negative effect on growth though it was only a 1 year lag of capital that is significant. The error correction variable ecm (-1) has the expected three features. It is negative, <1 and significant. It shows that it can rightly correct about 72% of variation of real GDP from its long run value.

CONCLUSION

Education has been viewed as a basic ingredient for development, hence its importance is inherent in its roles as a means of understanding, controlling, altering and redesigning of human environment (Central Bank of Nigeria, 2000). Education has direct relationship with a country's economic development. Anyanwu *et al.* (1997) puts it that education improves health, productivity and access to paid employment.

The study so far dealt with education expenditure and economic growth in Nigeria with a view to analyzing its trends over the years. From the study, it was revealed that education expenditure had negative impact on growth. This may not be unconnected with the fluctuating nature of Nigeria's pattern of spending on education sector. Today, schools are characterized with humiliating features where schools at various levels lacked teachers and basic infrastructure. The schools suffer from over crowding, poor sanitation, poor management and poor intra sectoral allocation. Other characteristics are abandoned capital projects, inadequate funding and poor

conditions of service among others. Hence, the result of these humiliating characteristics are closure of schools and strikes which consequently manifest in low economic quality of the labour force.

Again, researchers discovered that population had positive impact on growth though not significant but capital stock had negative effect on growth. Considering government's commitment to education sector not much would be expected from unimproved and unenhanced capital stock. Thus, researches have shown that countries that invested heavily on the training of human resources in which education is a major tool, experienced rapid economic growth than countries who pay leap service to the sector. In conclusion, researchers can unequivocally state that education has not gained its right place in Nigeria to boost economic growth well enough.

RECOMMENDATIONS

Based on the findings, it is therefore recommended that Nigeria increases her annual statutory or budgetary allocation to the education sector. Also, the increase should maintain an upward review rather than a dwindling pattern. This becomes pertinent considering the increase in the number of people seeking formal education particularly at the tertiary levels because only trained labour force can meaningfully and optimally contribute to societal development. Education is considered the most direct avenue to human capital formation that produces labour force that is effective and efficient for growth and development as the economic quality of a country's labour force cannot be divorced from the strength of education sector.

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