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EMPIRICAL ANALYSIS OF EDUCATION EXPENDITURE AND YOUTH EMPLOYMENT IN NIGERIA, 1980-2013: A BOUND TESTING APPROACH TO CO-INTEGRATION

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Abstract

The paper examines the role of public expenditure in education and its impact on youth unemployment in Nigeria for the period 1980-2013. The paper argued that the major problem facing education sector in Nigeria is inadequate funding. The objective of the study is to assess impact of education expenditure on youth unemployment in Nigeria. The study employed ARDL model and result reveals that in the short run education expenditure and FDI have negative impact on youth unemployment while health expenditure and lagged unemployment exert positive impact with no variables statistically significant. However, in the long run the variables had significant impact on youth unemployment with about 34 percent spend of adjustment. The paper recommends increase in education expenditure to ensure adequate learning environment that will be affordable to majority of Nigerian youths.

The role of education in economic development has been recognized for quite some time in mainstream economic literature. Education has both intrinsic and instrumental value: it is desirable not only for the individual but also for the society as a whole (Sen, 1999). Education as private good benefits directly those who receive it, which in turn affects the individual's future income stream. At the aggregate level, a better educated workforce is thought to increase the stock of 'human capital' in the economy and increase its productivity. Considering the externalities in education, it is widely accepted that the state has an important role to play in ensuring equitable distribution of educational opportunities to the entire population. Education is considered a major remedy for many problems faced by developing countries and as such improving the education of people is not only a goal in itself for a better quality of life but also its positive impact on the economic development of a country is far-reaching (Rebelo, 1991). Education plays a great and significant role in the economy of

a nation, thus educational expenditures are found to constitute a form of investment. This augments individual's human capital and leads to greater output for society and enhanced chances of employment in the labour market.

Education is a source of economic growth and development if and only if it is anti-traditional to the extent that it liberates, stimulates and informs the individual and teaches him how and why to make demands upon himself (Odior, 2011). In Nigeria, since there are not adequate empowerments of the youths by way of giving them quality and affordable education, the level of youth unemployment has been increasing. This is beside those who have acquired either Bachelor degrees or Polytechnic and Colleges of Education graduates that have no gainful employment.

According to Aiyedogbon and Ohwofasa (2012), a high level of un-and underemployment is one of the critical socio-economic problems facing Nigeria. While the labour force grows with an increasing proportion of youth, employment growth is inadequate to absorb labour market entrants. As a result, youth are especially affected by unemployment. Moreover, young people are more likely to be employed in jobs of low quality, underemployed, working long hours for low wages, engaged in dangerous work or receive only short term and/or informal employment arrangements. The inadequate employment situation of youth has a number of socio-economic, political and moral consequences. This has resulted in poverty in Nigeria which is chronic and rising. The share of the total population living below the \$1 a day threshold of 46 per cent is higher today than in the 1980s and 1990s—this despite significant improvements in the growth of GDP in recent years (Aiyedogbon and Ohwofasa, 2012).

Unemployment and underemployment reflect the failure to make use of an important factor of production, labour, for fostering economic growth in Nigeria. Low returns to labour as well as high unemployment indicates poverty. Poverty makes it difficult to make investments in education and health that would increase a person's productivity. This is not only true for individuals; families face an inter-generational poverty trap. They face the choice between sending their children and young family members to school and sending them to earn much-needed income. The social aspects of the problem lie in the association of unemployment with social exclusion and a sense of hopelessness. Structural unemployment and widespread poverty are believed to be the basis for the activities of miscreants such as militant youth in the Niger Delta and the present day deadly extremists in northern Nigeria upsetting the seemingly peaceful and stable political situation. The activity of Boko Haram has resulted in death of many innocent souls and destruction of property worth millions of dollars (Aiyedogbon and Ohwofasa, 2012).

As a result of poor funding of the education sector despite the country's relative oil wealth, unemployment is widespread, and Nigeria's basic social indicators place it among the twenty poorest economies in the world (World Bank, 2010). In addition, many Nigerians have continued to wallow in abject poverty, while more than 50 percent

live on less than US\$1 per day. Dilapidated infrastructure (especially roads and power supply) in Nigeria is everywhere a visible sign which has led to the collapse of many industries, and has resulted in high level of unemployment (Ohwofasa, Obeh and Atumah, 2012). The objective of the paper therefore is to assess the extent at which public expenditure in education has helped to reduce the unemployment level in Nigeria over the last three decades. Consequently, the paper is structured as follows. Following the introduction, in section two brief related literatures was presented while section three presents the model. And whilst section four contains data and discussion, section five concludes the study and makes policy recommendation.

Review of Related Literature

The Nigerian economy is growing without appreciable employment opportunities for its teeming population which has serious socio-economic consequences. According to the NPC (2011), the growth rate of the Nigerian economy is estimated at about 6.5 percent while the country's population growth rate is 2.5 percent. The high level of infrastructure deficits and limited employment growth are major constraints to socioeconomic development of Nigeria. There has not been any significant improvement in the standard of living of about 70 percent of Nigeria's population for more than a decade due to these constraints (Eneji, Mai-Lafia and Weiping, 2013). The growth in crude oil revenue in Nigeria is accompanied by relatively limited employment growth and deteriorating education standard. For every graduate, finding a decent job is a milestone towards self-reliance and contributing to poverty reduction, social stability and sustainable development. One would have assumed that graduates stand a better chance to be gainfully employed than people with secondary school education. However, the growing rate of graduate unemployment puts a big question mark on the economy and the education system (Eneji et al., 2013). According to Ashimuneze (2011), about 20 percent of Nigeria's unemployed are very poor, but are well educated and skilled, even by European and American standards. Nigeria exports far more skilled labor and trained intelligentsia than it attracts which is not healthy for self-reliance and socio-economic development.

Government expenditure on the educational sector deals with how the amount allocated to education is spent. According to Aiyedogbon, Ohwofasa and Obeh (2014), one of the methods of determining the flow of educational finance is to study the time trend of educational expenditure, a trend that is determined by budgetary allocations. Consequently, there has been a substantial body of theoretical and empirical analyses regarding the contribution of human capital in explaining the divergence in the rates of growth across countries of the world. The literature points to schooling as the major determinant of differences in productivity, although the appropriate method of including the schooling variable is still open to debate. However, there is a general consensus on the importance of education, especially elementary education, in fostering and sustaining economic growth and development. The development literature has highlighted the role of education in reducing unemployment that prevails in many developing societies (Chandra, 2010).

Education is both consumption as well as a capital good, but the conventional credit market mechanisms do not operate efficiently. Unemployment can persist across generations if the level of education is such that there is a mismatch between skills offered by educational institutions and skills required by employers of labour. This characteristic has been used to justify public intervention in the provision and financing of education from the equity perspective. Cross-country studies have tried to quantify the impact of government expenditure in raising educational and health indicators.

Empirically, education is a major aspect of human capital and investment in education certainly has a significant impact of social development and subsequently on overall economic growth of any economy in general and emerging economies in particular. This is while Chandra (2010) examines the causation between government expenditure on education and economic growth in India for the period, 1951-2009. Employing linear and non-linear granger causality methods the results indicate that economic growth affects the level of government spending on education irrespective of any lag effects, while investments in education also tend to influence economic growth with time-lag. Aiyedogbon et al., (2014) examine the determinants of education expenditure in Nigeria for the period 1980-2012. The study which employs co-integration and VAR methods revealed that oil revenue was the most important determinant in funding education expenditure both in the short and the long run in Nigeria. And whilst non oil revenue was more or less not substantial, impact of external sector on education expenditure was deleterious. Ohwofasa et al., (2012) investigate the relationship between government expenditure in the education sector and economic growth in Nigeria from 1986 to 2011. The study employs co-integration and error correction method and found that long run relationship exists between the variables. The results further indicated that a one year lag of gross domestic product, current level of recurrent expenditure on education, two year lags of recurrent expenditure on education, current as well as two year lags of gross capital formation exhibit positive impact on economic growth in Nigeria. On the other hand, previous year capital expenditure on education and human capital development has negative and significant impact on economic growth within the period.

Blankenau, Simpson and Tomljanovich (2005) carried out an empirical study on expenditure-growth relationship in the context of an endogenous growth model. They found that the response of growth to public education expenditure may be nonmonotonic over the relevant range. The paper argued that the relationship depends on the level of government spending, the tax structure and the parameters of production technologies. Thus looking at the literature, the focus of authors were either the impact of education expenditure on economic growth or the determinants of education expenditure in Nigeria. Consequently, no studies to the best of knowledge attempt to examine effect of education expenditure on youth unemployment which becomes the lacuna the present study attempts to close.

The Method

The study adopted autoregressive distributed lag (ARDL) model which provides long and short run analysis of the impact of public education expenditure on youth unemployment. To ensure a robust result, other two variables were included to the explanatory variables. Specifically the model is presented thus:

$$UN = f(GEE, GEH, FDI) \dots \dots \dots (1)$$

Where:

UN = unemployment rate

GEE = Government expenditure in education

GEH = Government expenditure in Health sector

FDI = Foreign direct investment

Technique of Analysis

ARDL bounds testing approach to co-integration was originally developed by Pesaran and Pesaran (1997) and expanded by Pesaran, Shinb and Smith (2001). The model testing procedure starts with a test of null hypothesis of no co-integration. The calculated F-statistic is compared with the critical value tabulated by Pesaran et al., (2001). If the F-test statistic exceeds the upper critical value, the null hypothesis of no long-run relationship can be rejected regardless of whether the underlying orders of integration of the variables are I(0) or I(1) and if it falls below the lower critical value the null hypothesis cannot be not rejected. However, if the sample F-statistic falls between these two bounds, the result is inconclusive.

The first step in estimating the model is to determine the lag orders suggested by Schwarz Information Criteria (SBC) and Akaike Information Criteria (AIC) using a vector autoregressive (VAR) model. This is then followed by ARDL estimation. Thus, the ARDL model of equation (1) is estimated below.

$$\Delta \ln UN_t = \alpha_0 + \sum_{i=1}^K \alpha_1 \Delta \ln UN_{t-i} + \sum_{i=1}^K \alpha_2 \Delta \ln GEE_{t-i} + \sum_{i=1}^K \alpha_3 \Delta \ln GEH_{t-i} + \sum_{i=1}^K \alpha_4 \Delta \ln FDI_{t-i} + \alpha_5 \ln UN_{t-1} + \alpha_6 \ln GEE_{t-1} + \alpha_7 \ln GEH_{t-1} + \alpha_8 \ln FDI_{t-1} + \mu_t \dots \dots \dots (2)$$

From equation (2), the null hypothesis of no co-integration $H_0: \alpha_1 = \alpha_2 = \alpha_3 = \alpha_4 = 0$ is tested against the alternative hypothesis $H_1: \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq \alpha_4 \neq 0$. If a stable long-run relationship is supported by Wald test from table of value, then in the second stage, the augmented ARDL (m, n, o, p) model is estimated as following:

$$\ln UN_t = \beta_0 + \sum_{i=1}^m \beta_1 \ln GEE_{t-i} + \sum_{i=1}^n \beta_2 \ln GEH_{t-i} + \sum_{i=1}^o \beta_3 \ln FDI_{t-i} + \varepsilon_t \dots \dots \dots (3)$$

And the final step is the estimation of the short-run dynamic coefficients via the error correction model to capture the speed of adjustment of unemployment rate as expressed below:

$$\Delta \ln UN_{t-1} = \delta_0 + \sum_{i=0}^m \delta_1 \Delta \ln UN_{t-i} + \sum_{i=0}^n \delta_2 \Delta \ln GEE_{t-i} + \sum_{i=0}^0 \delta_3 \Delta \ln GEH_{t-i} + \sum_{i=0}^p \delta_4 \Delta \ln FDI_{t-i} + \lambda ECM_{t-1} \dots (4)$$

Where the ECM_{t-1} is the error correction term resulting from the verified long-run equilibrium relationship and λ signifies the speed of convergence to the equilibrium process. Pesaran et al., (2001) argued that it is extremely important to ascertain the constancy of the long-run multipliers by testing the above error-correction model for the stability of its parameters using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of square of recursive residuals (CUSUMSQ) earlier introduced by Brown, Durbin and Evans (1975).

Unemployment: This refers to the level of unemployment when those who are able and willing to work cannot find jobs. Increase in public expenditure in education is expected to reduce unemployment rate as many people are empowered through acquiring education.

Foreign Direct Investment (FDI): This is the sum of equity capital, the net inflows of investment as shown in the balance of payments (BOP). It also includes reinvestment of earnings, other long-term and short-term capital investment to acquire a lasting management interest in enterprises operating in the Nigerian economy. Inflows of FDI into a country have the potential to reduce unemployment.

Public Expenditure on Health: This is government expenditure into the health subsector aimed at boosting the health status of the population. A healthy population will be more readily available for employment which will increase the level of productivity in the economy.

Data and Discussion

Table 1 presents the ADF unit root test where the variables are either integration of order 1 or 0.

Table 1: ADF Unit Root Test

Variable	Level	1 st Difference	Order	Include in Equation
LUN	-1.567657	-3.980326	1	Trend and intercept
LGEE	-2.478361	-4.271464	1	"
LGEH	-3.671186	-4.533885	0	"
LFDI	-2.080107	-3.645154	1	"
Critical Value 5%	-3.5562	-3.5614		

Consequently, the ARDL model was estimated with lag order of 2 as suggested by AIC and SC.

Table 2: ARDL Model Estimate

Dependent Variable: ΔLUN

Variable	Coefficient	Std error	t-statistics	Prob
Constant	-1.705584	1.215519	-1.403173	0.1776
DLUN(-1)	-0.074270	0.196578	-0.377813	0.7100
DLUN(-2)	0.095223	0.208261	0.457227	0.6530
DLGEE(-1)	-0.611349	0.392347	-1.558185	0.1366
DLGEE(-2)	-0.681998	0.279245	-2.442296	0.0251
DLGEH(-1)	0.618685	0.385625	1.604368	0.1260
DLGEH(-2)	0.377848	0.281939	1.340178	0.1969
DLFDI(-1)	-0.065726	0.143540	-0.457892	0.6525
DLFDI(-2)	-0.016529	0.144606	-0.114302	0.9103
LUN(-1)	-0.290462	0.147213	-1.973079	0.0640
LGEE(-1)	0.580187	0.537868	1.078680	0.2950
LGEH(-1)	-0.479453	0.487634	-0.983223	0.3385
LFDI(-1)	0.085783	0.082289	1.042459	0.3110
$R^2 = 0.47$; DW = 2.26				
<i>Diagnostic Test</i>				
Serial Correlation LM F-test		0.810364(0.462136)		
ARH LM F-test		0.019917(0.888642)		

According to Peseran et al., (1997, 2001), the OLS regression with appropriate lag differences are of no direct interest to the bounds co-integration test and so is only presented to enables us to determine the F-test.

Table 3: ARDL Bound Test for Co-integration

	5 % Level		10 % Level	
	I(0)	I(1)	I(0)	I(1)
K				
4	2.86	4.01	2.45	3.52

Computed F-Statistics = 4.67

Notes: Critical values extracted from Pesaran, et al (2001) Table CI (iii) Case III: Unrestricted intercept and no trend. However, the F-stat presented alongside the p-values in parenthesis shows that the model survives battery of diagnostic tests as the serial correlation and ARCH LM tests reject the null hypothesis while the test of cumulative sum of recursive residual (CUSUM), not shown, reveals that the model is stable. Table 3 shows that the F-stat is greater than the upper bound and we conclude that there is evidence of a long-run relationship between the time-series (unemployment, FDI, education and health expenditures) in the period under review.

Dynamic Model Estimates

Table 4 presents the dynamic model which encompasses both the short and long run estimates. It can be seen that the model has statistical validity as the variables are serially uncorrelated and reject the heteroscedasticity hypothesis.

Table 4: ARDL Co-integration and Long Run Form

Dependent variable: ΔLUN

Method: Least Squares

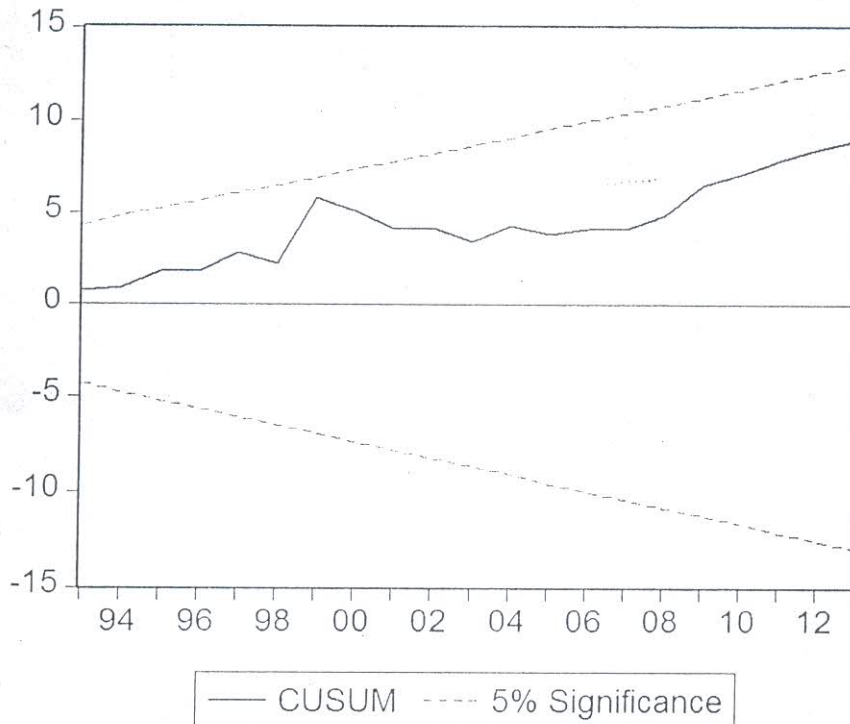
Variable	Coefficient	Std error	t-statistic	Prob
Constant	0.052520	0.092297	0.569035	0.5754
DLUN(-1)	0.024274	0.193927	0.125170	0.9016
DLUN(-2)	0.234914	0.197344	1.190375	0.2472
DLGEE(-1)	-0.252884	0.245347	-1.030721	0.3144
DLGEE(-2)	-0.429083	0.218622	-1.962666	0.0631
DLGEH(-1)	0.275124	0.246467	1.116274	0.2769
DLGEH(-2)	0.200076	0.243839	0.820527	0.4211
DLFDI(-1)	-0.047698	0.129517	-0.368280	0.7164
DLFDI(-2)	-0.004783	0.129250	-0.037009	0.9708
ECM(-1)	-0.337448	0.143305	-2.354754	0.0283
$R^2 = 0.36$; F-stat = 1.9; DW = 2.1				
<i>Diagnostic test</i>				
Serial correlation F-test		0.472738(0.630430)		
ARCH LM F-test		0.001499(0.968038)		

In terms of relationship, the R-square reveals that the explanatory variables explained about 35 percent of unemployment while the DW statistic reaffirms absence of serial correlation in the model. A cursory look at the table show that in the short run, the impact of previous unemployment and health expenditure on current unemployment is positive while that with education expenditure and FDI is negative. Similarly, table 4

Empirical Analysis ...

reveals that none of the lagged variables is individually significant at 5 percent level. Jointly too, they are insignificant as the joint p-values as UN is 0.499658, GEE 0.158711, GEH 0.503635 and FDI 0.933196 less than 0.05 or 5 percent level.

Test of stability



On the other hand, the ECM represents the speed of adjustment between the short and long run. Its coefficient which is negative and significant is what is expected if there is co-integration between the dependent and the explanatory variables. The magnitude of this coefficient implies that about 34 percent of any disequilibrium between unemployment and the independent variables is corrected within one year. Thus, in the long run all the variables are statistically significant. Finally, the stability test reveals that the CUSUM plots lies within the 5% critical boundary which shows that our model is stable.

Concluding Remarks

The paper focuses on the role of public expenditure in education and to what extent it has impacted on youth unemployment in Nigeria for the period 1980-2013. It has been argued that despite the country's relative oil wealth funding of the education sector has been poor and this has made unemployment and poverty widespread. Four

macroeconomic variables employed include unemployment rate, public expenditure in education, public expenditure in health and FDI while the method of study is the ARDL model and the stochastic properties of the series were investigated with ADF unit root test. The empirical result reveals that in the short run education expenditure and FDI have negative impact on youth unemployment while health expenditure and lagged unemployment exert positive impact with no variables statistically significant. This means that even though education expenditure has negative impact on youth unemployment or positive impact on employment in the short run, the effect is not felt. Some of the reasons may include lack of consistent education policy and holistic fund disbursement meant for the sector. However, in the long run the variables are statistically significant and the impacts were felt on youth unemployment with about 34 percent spend of adjustment. It is recommended therefore that there should be increase in education expenditure to ensure adequate learning environment that is affordable to majority of Nigerian youth which will in turn empower them.

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