Education Financing, Labour Productivity, and Economic Development in Nigeria

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A b s t r a c t

The paper investigated the relationship between education financing, labour productivity and economic development in Nigeria. The study was anchor on the human capital theory. Secondary data from 1970 to 2015 were used to analyze these relationships with the help of the Vector Autoregressive Model (VAR), it was found that there is a long run relationship between education financing, labour productivity and economic growth in Nigeria. The study also found that in the short-run, education financing has a positive but insignificant relationship with labour productivity; and labour productivity in the short-run has a positive but statistically insignificant relationship with economic growth in Nigeria. It was concluded that education financing in Nigeria has the positive potentials of boosting labour productivity in the country, however, at present, the impact is negligible because of inadequate education financing that is far below the UNESCO recommendation of 26% budgetary allocation to the educational sector of developing countries. Also, the low impact of education financing on labour productivity is partially ascribed to high level of unemployment in the country that has made many graduates to remain unemployed upon graduation. It was also concluded that because there is high unemployment and probably over reliance of the economy on oil over the decades, labour productivity has very low impact on national output and hence, economic development of the country. Emergent from the above findings and conclusion, it was recommended that as a matter of urgency, the government should increase investment in the educational sector and intensify efforts on science and technology as well as entrepreneurship training of the labour force so as to make it productivity and contribute to the growth of the national output and reduce the high level of unemployment. It is the position of this paper that if the budgetary allocation to the educational sector is step up to 26% as recommended by UNESCO, the productivity of labour will be enhanced. This could protect the economy from further negative trends in productivity growth. The implication will be that national output will increase leading to the overall economic development of the country.

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Background to the Study

Education is the spring board for social and economic change. It plays a major role in the social and economic development of a nation. It is important in the human development as a supplier of trained man power. Education helps in increasing the productive capacity of a country's workforce. This is because education provides the workforce with the requisite knowledge, skills and competences for higher productivity.

According to Igbuzor (2006), the importance and linkage of education to the development of any society is well known. It has been documented that education satisfies a basic human need for knowledge, provides a means of helping to meet other basic needs, and helps sustain and accelerate overall development. Another important role of education lies in the fact that it helps to determine the distribution of employment and income for both present and future generations. And education influences social welfare through its indirect effects on health, fertility and life expectancy. It is in recognition of this importance that the international community and governments all over the world have made commitments for citizens to have access to education through education financing. The financing of education as an aspect of public finance embraces all aspects of funding of education including the sources of funding and how the money earmarked for education is spent especially for the purchase of goods and the services (Agbobu 1983, Borokhovich, Bricker, Zivney and Sundaram, 1995).

For education to achieve its important roles in an economy, it must be properly financed especially for developing countries it must be functional and qualitative which in turn depends on adequate financing. According to UNESCO, the minimum amount to be spent by a developing country on education is 26% of a country's annual budget. In Nigeria however, the allocation has been consistently below the minimum, from 5.49% in 2010, to 10.13% in 2011, to 10.48% in 2012, to 10.58% in 2013 and 12.30% in 2014. In Nigeria, the rate of illiteracy is very high. Most of the workers are unskilled and they make use of traditional equipment and methods of production and as a result, their marginal productivity is extremely low thereby leading to low real income, low savings, low investment, and consequently low rate of capital formation and under development.

Literature is less consensual on the impact of education financing on economic development. While several studies such as Isola and Alani (2012); Adawo (2011), Oluwalobi and Ogunrinola, (2011) supports the view that, education financing affects economic growth positively, Ndiyo, (2002) and Adebiyi (2005) are on the contrary. Moreover, none of these studies have used labour productivity as a conduit in the determination of the effect of education financing on economic growth. This therefore, makes this study novel and significant, especially now that the advocacy is more on improving the productive base of the economy as the era of petrol dollar is gone for good.
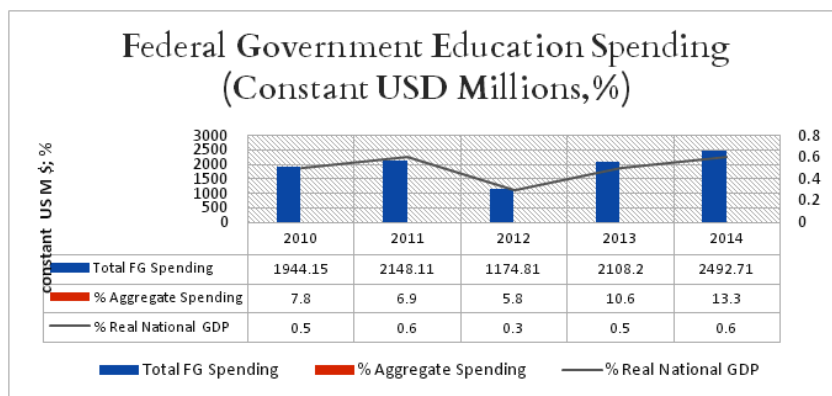
Education Financing in Nigeria

Government funding of education in Nigeria comes from different sources. Education is a concurrent responsibility of both the federal and state governments under the constitution. There are four main sources of public funding for the public (nonfederal) education sector: direct allocations from the federal government (through the Universal Basic Education Intervention Fund and the Education Trust Fund), state governments, local governments,

and private individuals and organizations, including nongovernmental organizations and international donors in some states. There is a huge lack of information on state and local expenditures for education, which makes accurate estimates of total spending difficult.

Domestic Financing of Education in Nigeria

The federal government (FG) makes nationwide policies and runs secondary (both junior and senior) and post-secondary institutions, including universities, polytechnics, and colleges. The FG funds these through annual budgetary allocations and several targeted interventions funds, including the Tertiary Education Trust Fund (TETFund), debt relief grant (DRG/MDGs), and constituency projects of federal legislators. These funds also benefit state government schools. In addition, the FG funds the construction of several Almajiri (Tsangaya) schools and participates in nomadic education and adult education campaigns. The FG's main intervention instrument in basic education is through a special Universal Basic Education (UBE) Fund, which makes matching grants to state governments (Nwoko,2015). FG education spending averaged nearly $2 USD billion annually between 2010 and 2014, which amounts to 7.8% of aggregate FG spending or 0.5% of real GDP (see Figure 1). Spending started above this $2 billion average and rose steadily each year, except in 2012, when it dipped sharply to less than $1.2 USD billion. The sharp fall in 2012 was not specific to the education sector; all government functions were affected due to the implementation of the FG's fiscal consolidation regime aimed to streamline spending and eliminate waste. The reduction was reflected in education's share of aggregate spending and GDP, which dipped significantly in 2012, but picked up thereafter (Nwoko,2015).
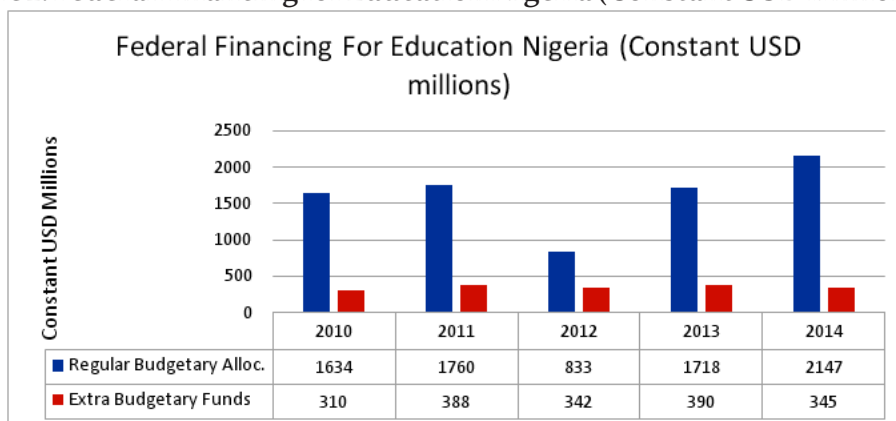
Figure 1. Federal Government Education Spending (Constant USD Millions, %)

Federal Government Education Spending (Constant USD Millions,%)

	2010	2011	2012	2013	2014
Total FG Spending	1944.15	2148.11	1174.81	2108.2	2492.71
% Aggregate Spending	7.8	6.9	5.8	10.6	13.3
% Real National GDP	0.5	0.6	0.3	0.5	0.6

Source: All 2014, UBEC, TETFund, DRG/MDG information from FM O E Annual Report 2014; other data from Audited FGN Financial Statements (2010 - 2013), courtesy (OAGF); Nwoko, 2015; analysis by authors

FG education spending has both budgetary and extra budgetary elements. Budgetary allocations account for an average of 82% per annum of FG education spending, and are mainly to the Federal Ministry of Education (FMOE) and its agencies. Extra-budgetary funds represent the remaining 18% and often accrue for education through certain dedicated funds outside FMOE's control (such as the Debt Relief Fund (DRF)/MDG and legislators' constituency projects). The two most prominent extra budgetary funds in education are the UBE Fund and the Tertiary Education Trust Fund (TETFund), with UBE being the larger (Nwoko,2015).

Figure 2. Federal Financing for Education Nigeria (Constant USD Millions)

Federal Financing For Education Nigeria (Constant USD millions)

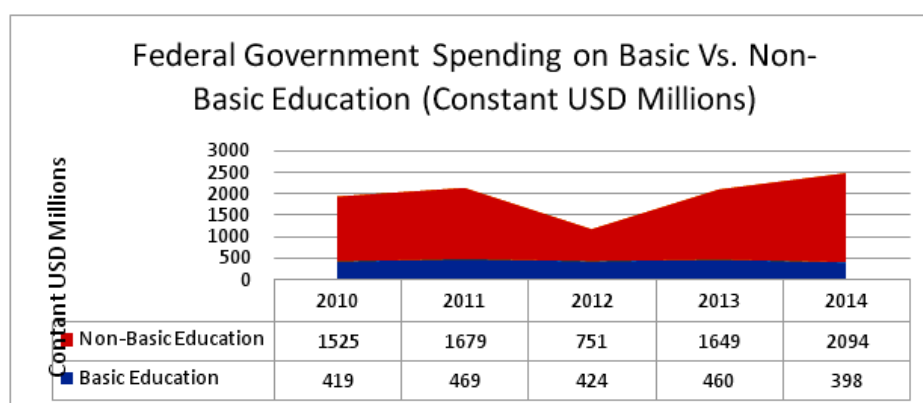|	2010	2011	2012	2013	2014
Regular Budgetary Alloc.	1634	1760	833	1718	2147
Extra Budgetary Funds	310	388	342	390	345

Source: All 2014, UBEC, TETFund, DRG/MDG information from FMOE Annual Report 2014; other data from Audited FGN Financial Statements (2010 - 2013), courtesy (OAGF); Nwoko 2015, analysis by authors.

The FMOE controlled 95% of budgetary allocations, which translates to 78% of total education spending at the federal level (see Figure 2). Targeted non-FMOE spending was 5% of budgetary expenditures (4% total education spending). UBEC receipts averaged $350 USD million between 2010 and 2014, but annual figures oscillated with FG earnings. TETfund is a dedicated fund for public (federal and state) tertiary institutions, financed by 2% prior tax on the profits of non-oil companies with over 100 personnel. Its share in total federal education funding is relatively small, averaging 0.3% in the period. Although budgetary spending appears prominent at 82%, it falls short of international good practice standards, which recommend minimal use of extra-budgetary funds to reduce associated fiscal risks (Nwoko, 2015).

Basic education spending averaged 23% of FG education spending between 2010-14 counting UBEC allocations, DRF/MDGs, and constituency projects, but excluding embedded spending on the junior secondary section of FG secondary (unity) schools. Figure 3 depicts the annual trend.
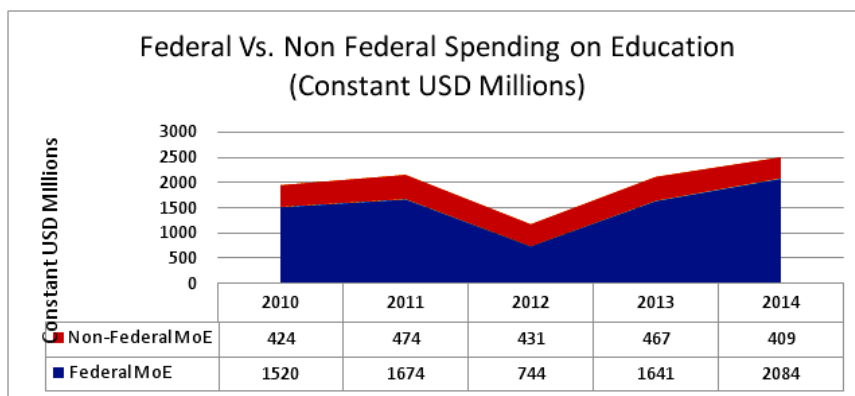
Figure 3. Federal Spending on Basic vs. Non Basic Education (Constant USD Million)

Federal Government Spending on Basic Vs. Non-Basic Education (Constant USD Millions)

	2010	2011	2012	2013	2014
Non-Basic Education	1525	1679	751	1649	2094
Basic Education	419	469	424	460	398

Source: All 2014, UBEC, TETFund, DRG/MDG information from FM O E Annual Report 2014; other data from Audited FGN Financial Statements (2010 - 2013), courtesy (OAGF); analysis by author.

Figure 4 shows federal vs. non-federal spending. The proportion of federal funding may seem small; however, basic education is a subnational government responsibility rather than a federal one as per Nigeria's fiscal federalism arrangements.

Figure 4. Federal vs. Non-Federal Spending on Education (Constant USD Million)
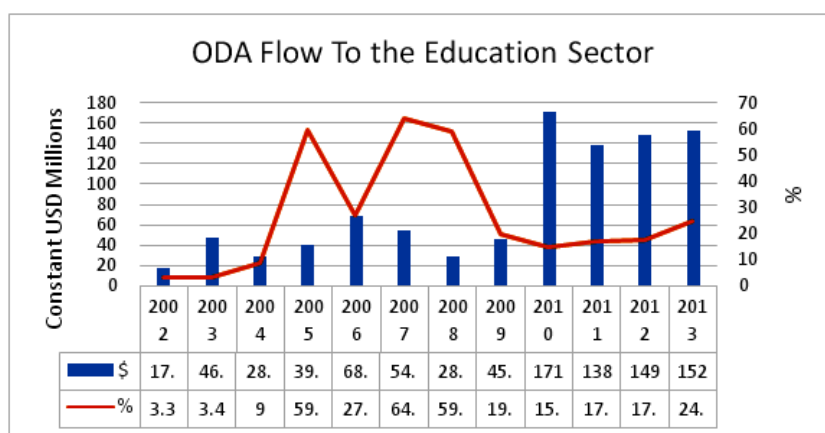

Federal Vs. Non Federal Spending on Education (Constant USD Millions)

	2010	2011	2012	2013	2014
Non-Federal MoE	424	474	431	467	409
Federal MoE	1520	1674	744	1641	2084

Source: All 2014, UBEC, TETFund, DRG/MDG information from FM O E Annual Report 2014; other data from Audited FGN Financial Statements (2010 - 2013), courtesy (OAGF); analysis by author.

External Financing of Education in Nigeria
This section briefly examines the size and division of Oversees Development Assistance (ODA) to the education sector.

Sector allocable ODA to education was initially low and unstable, but leaped almost four times in 2010 to $171 USD million. Although aid flow did not sustain this momentum, it did not fall to its pre-2010 levels; education ODA was $152 USD million in 2013 (see Figure 5) . The sharp rise in 2010 coincided with the outset of displacement of pupils in the northeast due to insurgency, suggesting that donors were likely responding to the situation.

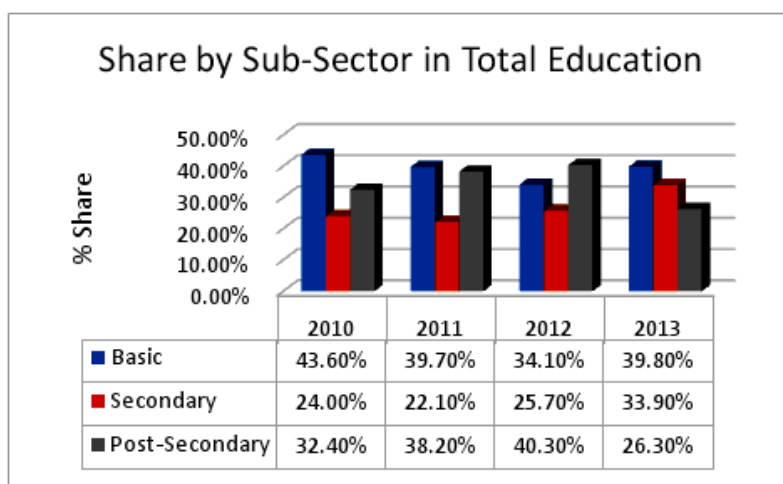**Figure 5. ODA Flow to the Education (sector allocable), 2002-13**

ODA Flow To the Education Sector

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
$	17.	46.	28.	39.	68.	54.	28.	45.	171	138	149	152
%	3.3	3.4	9	59.	27.	64.	59.	19.	15.	17.	17.	24.

Source: OECD - DAC; Nwoko, 2015; analysis by authors

$ - ODA flow to total education (sector allocable) %
 - ODA to basic education (sector allocable) as a percentage of total ODA to education (sector allocable)

As with sector allocable aid, sector and non-sector ODA to basic education grew in 2010 and remained high through 2013. However, the basic education proportion of total ODA has decreased steadily since then (see Figure 6). Moreover, basic education's share of total education ODA between 2010 and 2013 was below the recommended international standard of 50%, raising issues of about priorities and effectiveness of spending.

Figure 6: Share by Sub-sector in Total Education

	2010	2011	2012	2013
■ Basic	43.60%	39.70%	34.10%	39.80%
■ Secondary	24.00%	22.10%	25.70%	33.90%
■ Post-Secondary	32.40%	38.20%	40.30%	26.30%

Source: OECD Credit Reporting System; Nwoko,2015

Stylized facts of labour markets and Growth in Nigeria
Nigeria has continued to witness significant growth above the continental average in the last one and a half decades. Table 1 shows that Nigeria's GDP grew from 3.1 per cent in the 1990s to more than an average of 5 per cent beginning in 2000, largely driven by the value addition from the service sector. The major service subsectors include retail and wholesale, real estate, information, and communication (Barungi et al. 2015).

Table 1: Growth and Share of different Sectors in Nigeria GDP growth, 5-year averages (1990-2014)

|	1990-94	1995-99	2000-04	2005-09	2010-14
Agric. Value added (% of GDP)	25.4	27.5	29.2	25.1	21.9
Industry value added (% of GDP)	24.8	22.4	22.3	21.2	25.5
Services value added (% of GDP)	49.8	50.1	48.4	53.7	52.6
Growth in GDP (%)	3.1	2.1	6.5	6.3	5.7

Figure 2 presents the data on employed persons in Nigeria by sector from 1970 to 2014. Agriculture has continued to provide most of the jobs for the country's labour force albeit that this is declining. In 2014, it accounted for 45 per cent of all jobs, down from 51 per cent in 2000. The services sector is the second largest job-providing sector rising from 24 per cent in 2000 to 44 per cent in 2014, while the share of the manufacturing sector fell from 11 per cent in 2000 to 6 per cent in 2014. While the service sector is the fastest growing sector, the fall in employment in manufacturing industries explicates significant levels of de-industrialization. Its composition fell from 12.3 per cent in 1970 to 9.3 per cent in 2005 and 6 per cent in 2014. The industrial sector, especially manufacturing, is in a deplorable situation. Its contribution to GDP has been declining since the structural adjustment era and it is currently in the abysmally low single digits. The decline in industrial capacity, especially in heavy industry, has had serious impacts on Nigeria's long-term economic growth and poverty reduction. Despite the high economic growth witnessed in the last one and a half decades, the country has not yet been able to transform into an innovation-based high-skill (knowledge) economy. Hence, its trade composition and pattern are based on primary production, with very little role played in the global value chain.

**Figure 7: Trends of Employment by Economic Activity (Shre), 1970-2014**
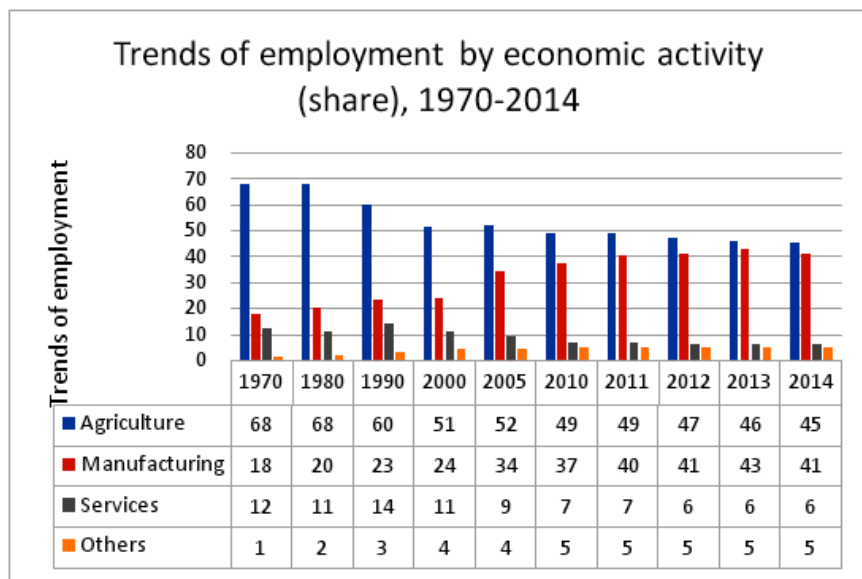
The unemployment rate across Nigeria has been very high since the beginning of this century. The figure below has shown that since 2000, the rate of unemployment has grown at a compound annual average of over 5.0 per cent, even as it has continued to fluctuate and intensify.

Figure 8: Unemployment Rate
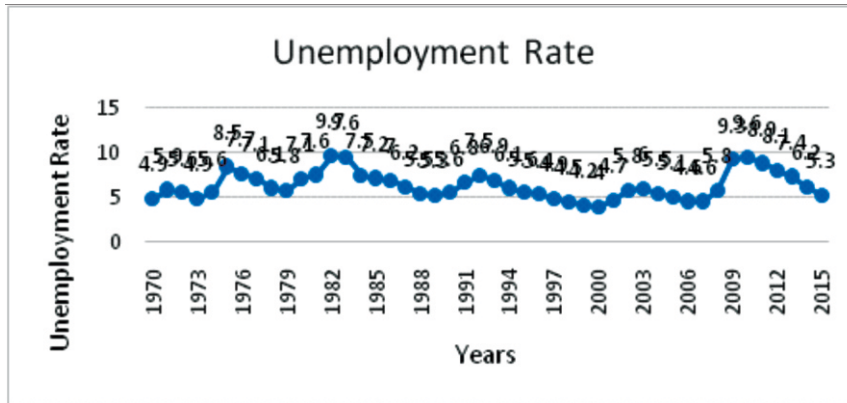
Youth unemployment on the other hand is intensifying. Large concentrations of youth, trained and untrained, educated and uneducated, are idle and without any hope of securing a decent job. Youth unemployment was recorded as 45.8 per cent in 2014. As can be seen from Figure 4, unemployment is generally high regardless of level of education. For example, as at 2014, unemployment rates among persons who never attended school, and those with secondary and post-secondary education hover around 25 per cent while the unemployment rate among persons with primary education or below is somewhat lower at 15.1 per cent and 17.1 per cent respectively. Among those who have secondary and post-secondary education, skills gaps and job search barriers are major barriers to gainful employment.

Figure 9: Unemployment rate (%) by Educational group, 2010-2014
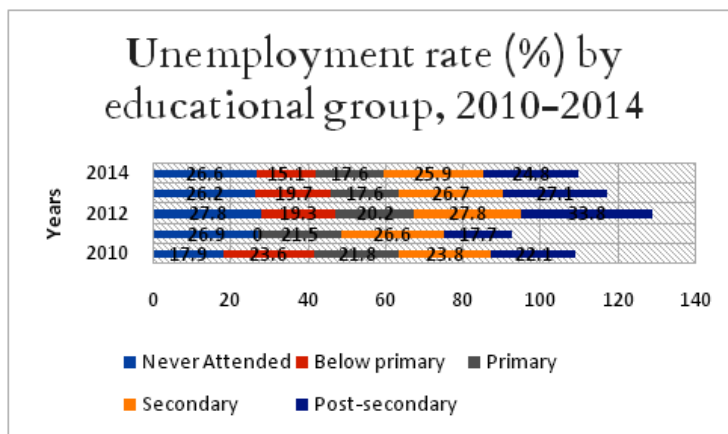
Theoretical Framework

The study is hinged on the theoretical foundation of the human capital theory. The proponents of this theory include Theodore Schultz, Garry Becker and Jacob Mincer. The theory was developed in 1960s due to the realisation that the growth of physical capital has accounted for only a small part of growth in the income. Furthermore, the emergence of education and skills training in military technology has also played an important role in the formulation of this theory. The main body of the Human Capital Theory can be found in the work of Becker (1964) titled "Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education." He acknowledged that the

Main motivation factor has probably been a realization that the growth of physical capital, at least at conventionally measured, explains a relatively small part of the growth of income in most countries. The research for better explanations has led to improved measures of physical capital and to an interest in less tangible entities, such as technological change and human capital. Also behind this concern is the strong dependence of military technology on education and skills, the rapid in expenditures on education and health, the age-old quest for an understanding of the personal distribution of income, the recent growth in unemployment in the United States, the Leontief scarce-factor paradox, and several other important economic problems.

Schultz (1961), introduced return-on-investment which highlights the cost-benefit analysis of training and education. This served as a basis for Becker's theory of human capital. Becker also introduced the concept of general-purpose human capital and firms-specific human capital which is widely used by human resource development practitioners word-wide today. In the words of Schultz (1961), human capital theory rests on the assumption that formal education is instrumental and even necessary to improve the production capacity of the population. In short, he argued that educated population is a productive population. The theory emphasizes how education increases the productive and efficiency of workers by increasing the level of cognitive stock of economically productive human capability which is a production innate abilities and investment in human capital which the proponents of the theory have considered as or even more equally worthwhile than that of physical capital. Human capital is substitutable, but not transferable like land, labour or fixed capital.

According to Fagerhind and Saha (1997), human capital theory describes its mechanism within the framework of Labour Economics as education; to him, the transformation of the raw human resource in to highly productive human resource is the process of education. That one would pay for education up to the point where the present value of the cost is equal the present value of stream of income generated by the educational achievement. This theory is the most influential economic theory of western education and is consistent with the ideologies of democracy and liberal progression found in most western societies where efforts to promote investment in human capital are seen to result to rapid economic growth for the society. So, most economists agree that it is the human resources of a nation neither its capital nor its material resources that ultimately determine the character and pack of its economic and social development. In the same vein, Psacharopaulos and Woodhall (1997) assert that: human capital or resources constitute the ultimate basis of wealth of the nations' capital and natural resources. Natural resources are passive factors of production; human beings are the active agencies who accumulate capital, exploits natural resources, build social, economic and political organizations and carry forward national development. This theory therefore, sees expenditure on education to be costly and so, should be considered as investment since it is undertaken to with a view to increase personal income which leads to the increase in aggregate output.

However, the theory is criticized from different points of view in time. One of the criticisms is that the theory is difficult to be tested, quality of education is not considered and those who take investment decisions cannot calculate its possible rates of return. Another point criticized is the problem of skills. Finally, the theory is the dual job market in the context that education will not be sufficient in eliminating income inequality (Harbison & Meyers, 1964). The schema model below explains the intertemporal dynamics of education financing, labour productivity and economic growth and development in an economy within the framework of human capital theory.

Schema 1: Schema model showing the economic effect of Education financing on Economic Growth
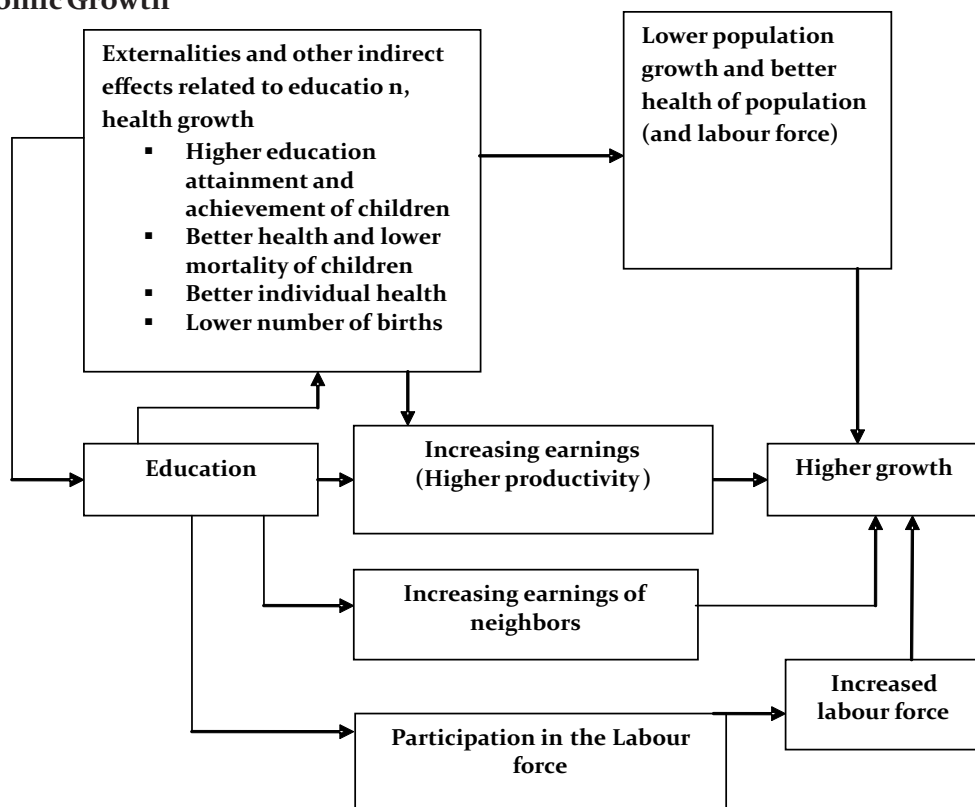
Source: Adapted by the author from Michaelowa, K. (2000). Returns to Education in Low Income Countries: Evidence for Africa.
http://www.hwwwa.de/Projects/ResProgrammes/RP/Development Processes/Vfs EL 2000 Rev2

Empirical Review
Literature is replete with studies on government expenditure on education and economic growth in Nigeria. For instance, Eigbiremolen and Anaduaka (2014), in their study of Human Capital Development and Economic growth in Nigeria using quarterly time series data for the period of 1999 to 2012. The results revealed a relatively inelastic relationship between Human capital development and output level. The study recommended adequate educational funding across all levels as a way of attaining economic growth and development.

Ohwofasa and Obeh (2012) in their study of the impact of government expenditure in Education on economic growth in Nigeria for the period of 1986-2011; using a parsimonious Error correction model (PECM). The study found a positive long run relationship existing between the study variables and they recommended among other things, improvement in government expenditure in the educational sector especially on capital components.

Oluwalobi and Ogunrinola (2011), examines the impact of government recurrent and capital expenditures on education and health in Nigeria and their effect on economic growth. Using a combination of bivariate and multivariate models with real output as dependent variable, the explanatory variables were government capital and recurrent expenditures on education and health, gross fixed capital formation and the labour force. The result of the study shows that there exists a positive relationship between government recurrent expenditure on human capital development and the level of real output, while capital expenditure is negatively related to the level of real output.

Adebiyi (2005) investigates the paradox that an increase in real educational expenditure reduces economic growth using Vector Autoregressive (VAR) model. The study used data from Nigeria for the period of 1973 to 2003. However, this study did not include labour force as one of the variables used in the model. His findings reveal that the impact of real capital educational expenditure on economic growth is consistently negative in Nigeria, which is a paradox. In essence, the contributions of education to economic growth depend on the quality of education.

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 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.

Adam (2005) analyses the impact of Human capital on economic growth in Nigeria. 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 (2007) 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 channeled 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.

Methodology

Empirical Model/model Specification

In the theory of human capital, the more educated and healthy are more productive. Thus, the productivity of the labour force is driven by her status of health capital and education [Kalemli-Ozcan et al. (2000)]. A healthy and educated work force is expected to contribute positively to the effectiveness and hence the productivity of a nation. Thus, the production function can be explicitly expressed as:

$$GDP_t = K_t^{\alpha} H_t^{\beta} E_t^{\gamma} L_t^{1-\alpha-\beta-\gamma} A_{it}^{T} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots 1$$

Where Health (H) and education (E) are the two components of human capital and maintaining the assumption of constant returns to scale (CRTS), the augmented aggregate productivity function can be written as:

$$GDPL = \left[\frac{K_t}{L_t}\right]^{\frac{\alpha}{1-\alpha-\beta-\gamma}} \left[\frac{H_t}{L_t}\right]^{\frac{\beta}{1-\alpha-\beta-\gamma}} \left[\frac{E_t}{L_t}\right]^{\frac{\gamma}{1-\alpha-\beta-\gamma}} A_{it}^{T} \dots\dots\dots\dots\dots 2$$

According to relation (2), labour productivity measured by output per worker (GDPL) is derived as a function of physical, health and education capitals per unit of labour service. Total factor productivity is measured by the technological index of the country, A_{it}^{T}.

Following the modelling procedures of Umoru and Yaqub (2013) with modifications, the productivity model for this study was expressed as follows:

$$GDPL = f\left(TEE, TEH, \frac{I}{GDP}, RWR, L\right) \dots\dots\dots\dots\dots\dots\dots\dots 3$$

The empirical evidence in this research uses total expenditure on education (TEE) as a proxy for education financing, investment-GDP ratio as a proxy variable for worldwide technological transfer, health capital is proxy by total expenditure on health (TEH) and labour is proxy by the Nigerian labour force. The wage rate is proxy by average real wage in the production sector (RWR). Labour input is proxy by the Nigerian labour force (L). Labour productivity is measured as output per unit of labour service defined as output-labour ratio.

The variables TEE and TEH are interacted, thus we include health capital-labour interaction and education-labour interaction. Health capital-labour interaction measure healthy labour in Nigeria, education- labour interaction measure the educated labour force and health education-labour interaction is a measure of the healthy educated labour force in Nigeria. The justification for the interaction is to evaluate the magnitude of the effects of health capital and education in productivity of the Nigerian labour force. We expect a positive impact of the healthy labour force on productivity. This is premised on the ground that with growth in labour supply, productivity is enhanced and hence a spillover effect on the growth of national output. The education variable is expected to contribute positively and significantly to labour productivity. Elsewhere, it has been empirically evaluated that education constitutes an essential determinant of productivity and growth by reducing structural unemployment (Beauchemin 2001; Blankenau and Simpson 2004). Given that labour productivity through education financing has spillover effect on the growth of national output, express our national output model as:

$$GDP = f(GDPL, EXR, INFL, FDI) \dots\dots\dots\dots\dots\dots\dots\dots 4$$

Where GDP is the national output, GDPL is labour productivity, EXR is the exchange rate, INFL is the inflation rate and FDI is foreign direct investment.

Thus, the stochastic forms of models 3 and 4 become:

$$LogGDPL = \alpha_0 + LogTEE\alpha_1 + LogTEH\alpha_2 + Log\frac{I}{GDP}\alpha_3 + LogRWR\alpha_4 + LogL\alpha_5 + \varepsilon_1 \dots\dots\dots\dots\dots 5$$

$$LogGDP = \beta_0 + LogGDPL\beta_1 + LogEXR\beta_2 + LogINFL\beta_3 + LogFDI\beta_4 + \varepsilon_2 \dots\dots\dots\dots\dots\dots 6$$

Where

α_0 and β_0 are the intercepts of models 5 and 6, respectively.

$\alpha_1 - \alpha_5$ are parameter estimates for model 5 and

$\beta_1 - \beta_4$ are parameter estimates for model 6

ε_1 and ε_2 are the error terms for models 5 and 6

Data Sources
The main sources of data include the World Development Indicators (2008), African Development Indicators (2009), UNDP Human Development Index, World Bank"s Socio-Economic Time-Series Access and Retrieval System (STARS), Penn-World Tables, International Monetary Fund (IMF) and Central bank of Nigeria's Statistical Bulletin. The data were sourced for the period of 1970 to 2015.

Estimation Technique
The estimation technique used in this study was the Vector Autoregressive model (VAR). Before the VAR was used the timer series were subjected to unit root test in order to avoid spurious regression estimates using the Augmented Dickey Fuller version.

Empirical Results
The stationarity results for the time series are shown in the following table:
Table 2: Unit Root test results

Variables	ADF Test Statistics	5% Critical Values	Remarks
ΔlnGDPL	-5.4432	-3.5229	I(1)
ΔlnTEE	-7.2345	-3.5229	I(1)
ΔlnTEH	-4.1882	-3.5229	I(1)
ΔlnI/GDP	-3.9241	-3.5229	I(1)
ΔlnRWR	-8.1109	-3.5229	I(1)
ΔlnL	-10.2114	-3.5229	I(1)
ΔlnEXR	-7.1102	-3.5229	I(1)
ΔlnINFL	-3.8141	-3.5229	I(1)
ΔlnFDI	-6.3141	-3.5229	I(1)
Unit root test include intercept and trend. Lag order for each variable was determined by SIC			

Source: Authors' Computations using Eviews 9

The unit root results revealed that all the variables are stationary after the first difference, that is , I(1). This means that the variables now have the mean reverting ability implying that any perturbation to the series will fade out with passage of time.

Given the uniform order of the ADF results, we proceeded with the Johansen co-integration test to ascertain the long-run relationship among the series. The result is presented in the following tables;

Table 3: Co-integration Test Results based on Johansen's maximum likelihood for GDPL Model

Null hypotheses	Trace statistics	5% critical values	Maximum eigenvalues	5% critical values
Ho: r=0	57	34.8	33.9	32.48
H_O: r≤2	42	32.4	34.2	29.61
H_O: r≤3	38	28.9	30.8	27.7
H_O: r≤4	22.4	25.2	24.4	25.9
H_O: r≤5	19.2	22.3	20.5	22.8
Note: r denotes 3 co -integrating vectors, AIC and SBC produced the same highest lag order required in the co -integration				

Source: Authors' computation using Eviews 9

The result in the above table shows that there are three co-integrating vectors meaning that the null hypothesis of no co-integration is rejected meaning that there is a long-run relationship between the variables.

Table 4 : Co-integration Test Results based on Johansen's maximum likelihood for GDP Model

Null hypotheses	Trace Statistics	5% critical values	Maximum eigenvalues	5% critical values
Ho: r=0	47	35.9	43.9	37.98
H_O: r≤2	38	32.4	30.2	29.99
H_O: r≤3	29	29.9	26.7	28.2
H_O: r≤4	23	26.2	22.9	23.8
Note: r denotes 2 co -integrating vectors, AIC and SBC produced the same highest lag order required in the co-integration				

Source: Authors' computation using Eviews 9

The result in the above table shows that there are two co-integrating vectors meaning that the null hypothesis of no co-integration is rejected meaning that there is a long-run relationship between the variables.

In order to ascertain the short-run dynamics of the variables, the VEC estimates were obtained and the results are presented in Table 5.

Table 6: VECM estimates of the productivity function

Explanatory variables	Co-efficients	t-values
Constant	22.4871	8.2411
ΔlnTEE(-1)	0.3421	1.5220
ΔlnTEH(-1)	0.4342	3.2413
ΔlnI/GDP(-1)	0.0321	2.9342
ΔlnRWR(-1)	0.2113	3.2198
ΔlnL(-1)	0.3219	2.8441
ECM(-1)	-0.3492	-3.219
Diagnostic tests		
R^2 (Adjusted)	0.768	
F-statistics	8.3456(0.048)	
White Test	2.119 (0.318)	Homoskedastic residuals
Breusch-Godfrey LM statistics	1.724 (0.243)	Non-autocorrelated residuals

Source: Authors' Computation using Eviews 9

The estimated coefficient for government investment in education is estimated with a positive but insignificant. This means government investment in education at present is not sufficient to propel the desired productivity. This means that successive Nigerian governments have adequately invested in education there is overwhelming need to invest substantially in the educational sector. The estimated effects of government investment in health on labour productivity is positive and significant at the 5 percent level. This means that 1% increase in government investment expenditure in health will boost productivity of the Nigerian labour force by 43.4%.

The positive coefficient the of real wages shows positive impact on productivity. This indeed conforms to expectations. The result suggests that with 1% increase in real wage rate, labour productivity will increase by 21.3%. The empirical plausibility lies in the fact that better health influences the decision to supply labour via its impact on wages. Thus, if wages are linked to productivity in this regard, and healthier workers are more productive, health improvements are therefore expected to increase wages and hence the incentives to increase labour supply. The estimated positive sign of worldwide technological transmissions, accounts for a significant effect on the productivity of the Nigerian labour force. This in quintessence is a measure of the substitution-effect. By intuition, given the slow pace of technological advancement in the country, use is made of the current level of worldwide technology. The error correction term indicates that 34.9% of the disequilibrium between the short-run and long-run output per worker is adjusted within one year. The R^2 value of 0.768 shows that variation in labour productivity in Nigeria is explained by the variables included in the productivity model.

All other diagnostic tests show that the estimated productivity model is plausible in explaining labour productivity dynamics in the Nigerian economy.

Table 5: VECM estimates of the GDP function

Explanatory variables	Co-efficients	t-values
Constant	-15.681	-4.7891
$\Delta \ln GDPL(-1)$	0.5691	1.7234
$\Delta \ln EXR(-1)$	-0.2541	-4.5671
$\Delta \ln INFL(-1)$	-0.3231	-3.6789
$\Delta \ln FDI(-1)$	0.0345	4.3452
ECM(-1)	-0.2478	-2.986
Diagnostic tests		
R^2 (Adjusted)	0.543	
F-statistics	6.456(0.002)	
White Test	5.329 (0.456)	Homoskedastic residuals
Breusch-Godfrey LM statistics	4.36 (0.553)	Non-autocorrelated residuals

Source: Authors' computation using Eviews 9

The estimated GDP model shows that labour productivity has positive but statistically insignificant coefficient impact on the national output. This may be because of high unemployment level in country. All other controlled variables included in the model appeared with the right signs and statistically significant. The diagnostic tests have indicated that the model performs well.

Conclusion and Recommendations

Based on the empirical findings of this study, it was concluded that education financing in Nigeria has the positive potentials of boosting labour productivity in the country, however, at present, the impact is negligible because of inadequate education financing that is far below the UNESCO recommendation of 26% budgetary allocation to the educational sector. Also, the low impact of education financing on labour productivity is partially ascribed to high level of unemployment in the country that has made many graduates to remain unemployed upon graduation.

It was also concluded that because there is high unemployment and probably over reliance of the economy on oil over the decades, labour productivity has very low impact on national output and hence, economic development of the country.

Emergent from the above findings and conclusion, it was recommended that as a matter of urgency, the government should increase investment in the educational sector and intensify efforts on science and technology as well as entrepreneurship training of the labour force so as to made it productivity and contribute to the growth of the national output and reduce the high level of unemployment. It is the position of this paper that if the budgetary allocation to the educational sector is step up to 26% as recommended by UNESCO, the productivity of labour will be enhanced. This could protect the economy from further negative trends in productivity growth. The implication will be that national output will increase leading to the overall economic development of the country.

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