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RESEARCH ARTICLE

DRIVERS OF HUMAN CAPITAL DEVELOPMENT: AN ANALYSIS OF PRIMARY AND SECONDARY EDUCATION OUTCOMES IN NIGERIA

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ABSTRACT

Learning through education and training is important in defining human capital because access to education is necessary to improve the quality of human resources. In this study, the drivers of human capital were examined using secondary data on primary and secondary education enrolment rates in Nigeria, 1981-2013. Effects of socio-political stability, per capita gross domestic product, government spending on education, health and agriculture were assessed alongside government oil and non-oil revenues. Data were analyzed using a combination of descriptive and inferential statistics, and regression techniques. Results revealed that gross primary enrolment was positively influenced by democracy ($p<0.01$) and per capita GDP ($p<0.05$). The boys' primary enrolment responded positively to changes in oil revenue ($p<0.01$), but negatively to per capita GDP ($p<0.01$) while the girls' responded positively to democracy ($p<0.01$) and negatively to health expenditure ($p<0.05$). Also, per capital GDP had a significant ($p<0.01$) positive influence on all secondary education outcomes, namely gross, boys' and girls' enrolments, as against the influence of agriculture that was significant ($p<0.01$) and negative. Generally, the study found some disconnect between school outcomes and non-oil revenue, education and health expenditure as these factors were grossly redundant in the estimated models. The study supports the sustenance of democracy and promotion of democratic institutions. While still in support of governments' continued funding of education, especially at the lower levels, areas of support should be redefined and prioritized. Sufficient funds should be provided to upgrade the constantly deteriorating infrastructures in public schools while deliberate policy instruments should be used to ensure provision of desired incentives to parents and school-age children to enhance enrolment into schools. Establishment of mini medical clinics in public primary and secondary schools across the country would help to cater for the immediate health care needs of pupils and students while in schools.

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INTRODUCTION

Human capital plays a significant role in fostering economic development. It is defined as an amalgam of factors such as education, experience, training, intelligence, energy, work habits, trustworthiness, and initiative that affect the value of a worker's marginal product (Frank and Benanke, 2007). Relating it to the organization, Bontis *et al*. (1999) described it as the human factor in the organization; it is the combined intelligence, skills and expertise that gives the organization its distinctive character. The human elements of the organization are those that are capable of learning, changing, innovating, and providing the creative thrust which if properly motivated can ensure the long-run survival of the organization (Bontis *et al*., 1999). Thus, human capital is central when discussing the concept of value creation in companies and enhanced economic activities in general (Kucharčíková, 2013; 2011). Investment in education and health is germane to improving the quality of human resources (Torruam, 2014). Both the stale Millennium Development Goals (MDGs) and the up-and-coming Sustainable Development Goals (SDGs) of the United Nations recognize the significance of investment in education and health care services in human capital development. On education, the Goal 2 of MDGs sought to "Achieve Universal Primary Education" with target 2A speculating that by 2015 all children everywhere, boys and girls alike, would be able to complete a full course in primary schooling. And building on the achievements of the MDGs, the Goal 4 of the SDGs seeks to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." SDGs' target

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4.1 is "By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes" while target 4.3 is "By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university." Among the specific steps to be taken towards pursuing the SDG 4 is to "Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, nonviolent, inclusive and effective learning environments for all." These affirmative statements attest to the global stance on education of the children, including the girls and the disadvantaged children, and investment in human capital.

The benefits of investment in education and human capital is enormous. For instance, Anyanwu and Erhijakpor (2007) succinctly argued that education and human capital play a critical role in driving economic growth in both the world's most advanced economies and the emerging economies that are currently experiencing profound transformations and periods of rapid growth and development. Investment in education contributes to economic growth and because education is the epitome of human capital (Volejníková, 2005), investing in people (human capital) is the main source of economic growth and development in a modern economy (Schultz, 1981). On the relevance of governments' investment in education, Baker and LeTendre (2005) observed that public education is the biggest initiative undertaken by many governments around the world. The reason for this is that as Mitra (2011) observed, a population that is better educated has less unemployment, reduced dependence on public assistance programs, and greater tax revenue. Consequently, education plays a key role in the reduction of crime, improved public health, and greater political and civic engagement, hence investment in public education are expected to have enormous social and economic benefits for individuals and society at large (Mitra, 2011).

However, for these expected benefits to be realized, education should be accessible to the children and others who are qualified to have it. School enrolments at various levels of education should rise to be in parity with the increasing population of the school-age children and others in need of education. This is because school enrolment has been identified as a measure of educational outcomes (Carsamer and Ekyem, 2015) and learning through education and training as important in defining the concept of human capital (Kwon, 2009). Incidentally, a survey conducted by United Nations International Children Emergency Fund (UNICEF) in 2011 revealed that Nigeria had the highest number of out-of-school children in the world (FME, 2015). It confirmed that one out of every three school-age children in Nigeria was out of school with the northern zone and girls constituting the higher proportion of out-of-school children. It becomes pertinent to ask: What are the drivers of education enrolments in Nigeria? Which factors influence school enrolment? How does school enrolment respond to changes in these factors? The objective of this study is to identify the drivers of human capital development, measured by education enrolment at different levels, and consequently, examine the response of school enrolment to changes in the identified determining factors. Although the investigation used only the available national time series (secondary) data, the finding is expected to serve as an important guide to the education policy makers and governments at different levels in Nigeria.

The Human Capital Theory

Human capital development is a system of improving the skills, knowledge, productivity, and inventiveness of people and access to education and health services is one of the major ways of improving the quality of human resources (Torruam, 2014). Human capital is defined as the sum of congenial and acquired skills, knowledge, talent, and inventiveness, which an individual uses for value creation in companies (Kucharčíková, 2013). It is also viewed as knowledge, skills, abilities, and other characteristics that are relevant for economic activities (Kucharčíková, 2011). The economists' approaches to the definition and understanding of the human capital concept can be classified into the: microeconomic and macroeconomic approaches. The former has two components: the business component, which considers human capital as a factor of production, and managerial component, which sees it as a business resource or asset that forms a part of the company's market value (Kucharčíková, 2011). As a business resource, the idea is that the workers are the most valuable resource of every organization, notwithstanding the range of executed duties. Under the macroeconomic approach to human capital development, human capital represents one of the production factors that are sources of economic growth. Economic growth being one of the main objectives of the economic policies of current governments can be achieved by extensive or intensive use of production factors, hence, it is possible to speak of an extensive and intensive economic growth (Kucharčíková, 2011) – the former arises from increasing the quantity of the production factors (including land, labor, and capital) while the latter results from increasing production per unit of input. Intensive economic growth is influenced by the quality, efficiency and manner of combining production factors, including the technical progress and increase in the total factor productivity. The level of work organization, available technology, technical support, level and quality of education, motivation of employees to increase their performance, and also the natural and soil conditions are among the determinants of aggregate productivity of a society (Kucharčíková, 2011). Investment in education contributes to economic growth and because is the epitome of human capital (Volejníková, 2005), investing in people (human capital) is the main source of economic growth in a modern economy (Schultz, 1981).

The underlying assumption of the human capital theory (HCT) was that formal education was extremely significant and relevant in the improvement of the productive capacity of any population (Almendarez, 2010). Building on this argument, the proponents of the human capital theory stressed that education increased the productivity and efficiency of workers by increasing the level of cognitive stock of economically productive human capability, which is a product of innate abilities and investment in human beings (Almendarez, 2010). They viewed formal education as an investment in human capital, which was equal to, or even more valuable than, physical capital (Psacharopoulos and Woodhall, 1997) since

such human capital investment would lead to greater economic outputs. Modern economists seem to concur that education and health care are key to improving human capital and ultimately increasing the economic outputs of the nation (Becker, 1993). Kwon (2009) observed that learning through education and training can be important in terms of defining the concept of human capital while Almendarez (2010) argued that in the new global economy, hard tangible assets may not be as important as investing in human capital. Further, Almendarez (2010) noted as follows:

"Throughout western countries, education has recently been re-theorized under human capital theory as primarily an economic device. Human capital theory is the most influential economic theory of western education, setting the framework of government policies since the early 1960s. It is increasingly seen as a key determinant of economic performance. A key strategy in determining economic performance has been to employ a conception of individuals as human capital and various economic metaphors such as technological change, research, innovation, productivity, education, and competiveness. Economic consideration *per se* in the past, however, has not determined education".

The salient point of the human capital theory has been that education and training is key to meaningful participation in the new global economy. According to a recent Organization of Economic Cooperation and Development (OECD) report, the radical changes to the public and private sectors of the economy introduced over recent years in response to globalization will be severe and disturbing to many established values and procedures. Another report accredited to OECD explains that internationalism in higher education is a component of globalization and a means to improve the quality of education (Almendarez, 2010). In keeping with human capital theory, it has been argued that the overall economic performance of the OECD countries is increasingly more directly based upon their knowledge stock and their learning capabilities. Clearly, the OECD is attempting to produce a new role for education in terms of human capital subject required in globalized institutions.

The human capital theory provides a basic justification for large public expenditure on education both in developing and developed nations (Fagerlind and Saha, 1997). Almendarez (2010) observed that it was consistent with the ideologies of democracy and liberal progression found in most western societies. Its appeal was based upon the presumed economic return of investment in education at both the macro and micro levels. Efforts to promote investment in human capital were seen to result in rapid economic growth for society. For individuals, such investment was seen to provide returns in the form of individual economic success and achievement. Most economists agree that it is human resources of nation, not its capital nor its material resources, which ultimately determine the character and pace of its economic and social development. Human resources constitute the ultimate basis of the wealth of nations. Capital and natural resources are passive factors of production, human beings are the active agencies who accumulate capital, exploit natural resources, build social, economic, and political organizations, and carry forward national development. Babalola (2003) adduced three arguments to justify investment in human capital as the need to: provide the new generation the appropriate parts of the knowledge already accumulated by previous generations; teach the new generation how existing knowledge should be used to develop new products, introduce new processes, production methods, and social services; and encourage people to develop entirely new ideas, products, processes, and methods through creative approaches. Also, Alfred Marshall, an English economist, had over a century ago expounded the rationale for public investment in education in his book *Principles of Economic* when he wrote that: "The schoolmaster must learn that his main duty ... is to educate character, faculties, and activities; so that the children of even those parents who are not thoughtful themselves may have a better chance of being trained up to become thoughtful parents of the next generation . To this end public money must follow freely. And it must flow freely to provide fresh air and space for wholesome play for the children in all working class quarters" (Barnett, 2008).

Drivers of human capital: a review of empirical literature

Human capital is defined as the sum of congenial and acquired skills, knowledge, talent, and inventiveness used by an individual for value creation in companies (Kucharčíková, 2013). There is a general belief among modern economists that education and health are key to improving human capital and the economic outputs of the nation (Becker, 1993), making investment in education and health synonymous with investment in human capital. Such investments help the individual learners to achieve better personal development, improved health status, social inclusion, labour market prospects and also foster broader economic performance of countries (OECD/UIS, 2003; 2006). As Torrum (2014) succinctly argued, access to education and health services is one of the major ways of improving the quality of human capital to enhance economic performance at both the micro and macro levels.

Several empirical investigations had been conducted on the impact of government spending and other drivers on educational outcomes in Africa and the rest of the world (including Carsamer and Ekyem, 2015; Devi and Devi, 2014; Odia, 2014; Bashir *et al*., 2011; Anyanwu and Erhijakpor, 2007; Bowale and Aremo, 2006; Baldacci *et al*., 2004; Al-Samarrai, 2003; Gupta *et al*., 2002; Deolalikar, 1997). The results have led to mixed conclusions (Dauda *et al*., 2011; Anyanwu and Erhijakpor, 2007). While some studies revealed that the direct impact of public investment on measures of education attainment was weak (Noss, 1991; Mingat and Tan, 1992), some reported significant positive relationship (as in Anyanwu and Erhijakpor, 2007; Gupta *et al*., 1999), and still others found existence of no significant relationship at all (Anand and Ravallion, 1993).

Baldacci *et al*. (2003) and Gupta *et al*. (2002) revealed that social spending is an important determinant of education outcomes. In their work that applied a latent variable model to the estimation of the relationship between government spending on health care and education, and social indicators, Baldacci *et al*. (2002) found that public social spending was an

important determinant of social indicator, particularly in the health sector. They recommended that an increase in education spending by one-third on average would foster the achievement of the millennium development goal (MDG) of universal primary education enrolment by 2015. In a similar study, which explored the direct and indirect channels linking social spending, human capital, and growth in 120 developing countries, Baldacci *et al*. (2004) used a system of equations to conclude that both education and health spending had a significant direct influence on the accumulation of education and health capital and by extension higher economic growth. However, the authors observed that higher spending alone was not sufficient in itself towards achieving the MDGs, but should be complemented by other good policy virtues like improving governance, reducing excessive budget deficits, and taming inflation.

The effects of macroeconomic variables like consumer price index, government revenue, employed labor force, government expenditure and health expenditure on school enrolment at various levels of education were examined in Pakistan (Bashir *et al*., 2011). The study found that employed labor force, government expenditure and health expenditure positively influenced enrolments while consumer price index and government revenue inversely impacted on enrolments at different levels of education in Pakistan. Also in Pakistan, Devi and Devi (2014) examined the effects of government spending and numbers of schools on enrolment and found that Also in Pakistan, Devi and Deve (2014) examined the effects of government spending and numbers of schools on enrolment and found that each variable had a significant influence. They recommended that government should increase expenditure and open more schools in urban and rural areas for easier access to children.

In Africa, a recent empirical investigation of effect of government educational expenditure on enrolments at primary and secondary school levels in 20 African countries by Carsamer and Ekyem (2015) found that educational expenditure positively increased school enrolments at both primary and secondary school levels with stronger impact at the secondary level. They identified political instabilities as a factor leading to decreased school enrolment while educational reforms increased it. Also, they identified per capita income as a channel through which universal basic education could be achieved. Similarly, Anyanwu and Erhijakpor (2007) studied the relationship between government expenditure on education enrolments, with illustration from Nigeria and other SANE (South Africa, Algeria, Nigeria, and Egypt) countries at the primary and secondary school levels. The results show that government expenditure on education has a positive and significant direct impact on primary and secondary education enrolment rates. Among the SANE, Nigeria has the greatest positive influence on increasing both primary and secondary education enrolment rates. The study found that the share of government education expenditure in GDP had positive influence in primary and secondary education enrolments in Africa. From the result, the study affirmed that a 10% increase in government spending on education increased primary enrolment by 21-28% and secondary enrolment by 33-42%. Also, the paper identified other policy interventions, such as consolidating and sustaining democracy, accelerating national income, and international community fulfilling its aid promises to Africa, can also be helpful in moving African countries (including the SANE) toward the Millennium Development Goals (MDGs). As such, higher expenditure alone is not sufficient to achieve the MDGs or to attain higher quantum and quality of human capital. This conclusion is consistent with the findings of Mingat and Tan (1992) that other variables such as per capital income, the age distribution of the population, parental perceptions of costs and benefits, urbanization and family background or parental education were statistically significant in explaining education outcomes.

In Nigeria, several studies had also sought to examine the determinants of school enrolments and schooling outcomes (including Odia, 2014; Dauda, 2011; Olaniyan, 2011; Bowale and Aremo, 2006). In the case of Dauda (2011), the study used the cointegration, error correction mechanism techniques to examine the effect of government educational spending and macroeconomic uncertainty on schooling outcomes in Nigeria. The study found indicated that public educational spending impacted positively while macroeconomic instability impacted negatively on schooling outcomes. Also, Bowale and Aremo (2006) investigated the effects of public education expenditure on primary school enrolment in Nigeria using the Johansen cointegration and its associated error correction analysis. They established a bi-directional causality between capital expenditure on education and enrolment and a uni-directional causality in case of recurrent expenditure and enrolment rate at this educational level running from school enrolment to recurrent expenditure on education. They explained that the impact of capital and recurrent expenditure on primary were found to be insignificant and suggested the need to inject more funds into the primary education with the aim of improving the human resources and infrastructure development. Investigations by Odia (2014) and Olaniyan (2011) were based on household surveys and the results are not reported here.

MATERIALS AND METHODS

Study Area

The investigation was conducted in Nigeria located between latitudes 4.67^{o} N and 13.87^{o} N and longitudes 2.82^{o} E and 14.62^{o} E in the western part of Africa. Nigeria is Africa's largest country with a total geographical land area of 923,768 square kilometers and a population of about 170 million. She shares boundaries in the north with Niger Republic, in the West with Benin Republic, and in the East with the Republic of Cameroun. She also shares boundaries in the North-East with Republic of Chad and in the South with the Atlantic Ocean, via the Gulf of Guinea. She lies wholly within the tropics along the Gulf of Guinea on the western coast of Africa. Nigeria has 6 geo-political zones, 36 states and a federal capital territory (FCT), 774 local government councils, and about 478 different ethnic groups, of which only ten (Hausa, Fulani, Yoruba, lgbo, Kanuri, Tiv, Edo, Nupe, Ibibio, and Ijaw) account for nearly 80% of the country's population (Global Corp, 2009). Around Nigeria, the lowest population densities are found in the northern regions, especially in the states of Adamawa, Borno, Kebbi, Kwara, Taraba, Yobe and

Zamfara. The country's annual rainfall ranges from about 450 mm in the northeast to about 3,500 mm in the coastal south-east, with rains falling within 90-290 days. The mean annual temperature ranges from 21°C in the south to 30°C in the north with lower and upper extremes of 14°C and 45°C respectively and an altitude range of 0-1000 meters above sea level. By virtue of the country's wide geographical spread, she consists of different climatic and agro-ecological zones with agriculture being the principal occupation of the rural population. The agricultural sector of the Nigerian economy is so well linked to the production matrix employing about 70% of the virile component of the nation's demography (Global Corp, 2009). Nigeria has a highly diversified agro-ecological condition, which makes the production of a wide range of agricultural products possible.

The National Policy on Education (NPE), which was first published in 1977 and revised in 1981, 1995, 1998, 2004 and 2006, provides for a 6-3-3-4 structure for the education sector. This translates into six years of primary schooling, three years of junior secondary, three years of senior secondary and four years of tertiary education (FME, 2015). In a further review in 2013, an additional one year was included to make for the formal inclusion of pre-primary education into primary education. The subsequent first ten years are therefore treated as a continuum of 10-year basic schooling which is offered in a seamless manner and it is the basis for the Universal Basic Education (UBE) programme (FME, 2015). The number of public primary schools in Nigeria increased by 8.4% from 54,434 in 2006 to 59,007 in 2010 (FME, 2015). Also, the country by Vide Cap No: 20 LFN of 2004 established The National Commission for Nomadic Education, to provide education to the nomadic pastoralists and migrant fisher folks whose population exceeds 9.4 million people, and of recent, the migrant farmers whose population is yet to be determined (FME, 2015).

Study data and sources

The study used secondary data on the gross primary and secondary schools' enrolment ratios, including the primary and secondary schools' enrolment ratios for male and female, originating from the United Nations, Educational, Scientific and Cultural Organisation (UNESCO), but extracted from the Index Mundi Official Website (IndexMundi, 2015). Also used were the actual data on national GDP, government revenue (including oil and non-oil components), and government expenditure (including capital and recurrent, and expenditure on agriculture, education and health), which were extracted from Central Bank of Nigeria Statistical Bulletin (CBN) on its Official Website (CBN, 2015). Data on democracy were generated as a dummy (assigning 1 to the years of democratic rule and 0 to the years of military authoritarian rule). The study covered the period 1981-2013.

Methods of data analysis

Descriptive and inferential analysis

Descriptive statistics used in the study include charts, measures of central tendency (including mean and median), measures of dispersion (standard deviation and variance), skewness and kurtosis in the data series used for the study. Inferences were drawn at different points on the basis of estimated Jarque-Bera, F-, χ^2- and t-values and their associated probabilities.

Empirical school enrolment model

The empirical model adapted for this study follow Anyanwu and Erhijakpor (2007). They specified school enrolment as a power function as follows:

$$\ln SCHENR_{it} = \alpha io + \beta_1 \ln NGDPK_{it} + \beta_2 \ln TEXPEDU_{it} + \beta_3 \ln TEXPHLT_{it} + \beta_4 \ln TEXPAGR_{it} + \beta_5 \ln OILREV_{it} + \beta_6 \ln NOILREV_{it} + \beta_7 \ln DEMO_{it} + \xi_{it} \quad \text{……..(1)}$$

where $SCHENR_{it}$ = school enrolment index, a measure of school outcome which entered the model as enrolment rates in percentages, $NGDK_{it}$=per capita gross domestic product (naira), $TEXPEDU_{it}$=total federal government expenditure on education (naira); $TEXPHLT_{it}$=total federal expenditure on health (naira), $TEXPAGR_{it}$=total federal government expenditure on agriculture (naira), $OILREV_{it}$=total federal government share of the oil revenue (naira), $NOILREV_{it}$=total federal government non-oil revenue (naira), $DEMO_{it}$=dummy variable used to capture democracy (1=democratic rule, 0=otherwise), and ξ_{it}=error term.

Variables in the empirical model

NGDPK is the nation's gross domestic product (GDP) per capita. GDP is the official measure of the total output of goods and services in the economy. It is the total market value of all final goods and services produced during a given time period within a nation's domestic borders. Per capita GDP is calculated as the GDP divided by the population over time. It is a proxy for national poverty, socio-economic status or standard of living (Anyanwu and Erhijakpor, 2007). It had been proven that per capita GDP was a critical determinant of human capital outcomes, and that as household incomes rose, the relative cost of enrolling children into school was reduced, implying that increasing income would be associated with rising enrolments (Anyanwu and Erhijakpor, 2007; Baldacci *et al*., 2004; Roberts, 2003). TEXPAGR is total federal government expenditure on agriculture. Expenditure on agriculture is considered for inclusion in the school enrolment model as a measure of government spending on economic services. From 1981-2014, TEXPAGR as a share of government spending on economic services averaged 17.4%. It is postulated that being an indicator of economic services, TEXPAGR will have a positive influence on education enrolment.

The components of the Federal Government of Nigeria (FGN) expenditure are: administration (including expenditure on defence, national assembly and internal security), social and community services (including expenditure on education and health), economic services (including expenditure on agriculture, construction, transport and communication), and transfers. The Federal Government's total expenditure on education ($TEXPEDU_i$) and Federal Government's total expenditure on health and health services ($TEXPHLT_i$) were

considered for inclusion in each model to reflect government investments in social and community services. $TEXPEDU_i$ is an indicator of the volume of resources flowing into education. It is expected to have positive effect on education enrolment (Anyanwu and Erhijakpor, 2007). This is because availability of resources would result to improvement in infrastructure thereby creating an enabling environment for parents to enroll their wards in schools. TEXPHLT is federal government expenditure on health and health care services. In view of the high incidence of ill-health among school children in developing countries, public investment in health care can substantially improve schooling outcomes. This can be done by directly affecting the health status of children, and hence their cognitive achievements, and by increasing the efficiency of time devoted by children to schooling and other activities (Khandker *et al*., 1994). Investment in public health that improves the health conditions of other members of a family such as the mother or sibling can also affect the schooling outcomes of children, especially girls who are responsible for the care of sick household members (Khandker *et al*., 1994). Consequently, it is expected that TEXPHLT will have a positive sign in the model. Together, education and health services are vital parts of the social and community services sector and it has been affirmed that social spending is an important determinant of education outcomes (Anyanwu and Erhijakpor, 2007; Baldacci *et al*., 2003; Gupta *et al*., 2002). Education and health care are key to improving human capital and ultimately increasing the economic outputs of the nation (Becker, 1993).

In the same vein, the revenue sources are categorized into two: oil revenue and non-oil revenue. Considering the position of Nigeria among the global oil economies, it was a wise idea to investigate the responsiveness of human capital development, indexed in this case by school enrolment to the nation's oil and non-oil wealth alike. As Ademola *et al*. (2015) rightly argued, providing adequate education and health services to people using crude oil revenue was one of the major ways of improving the quality of human resources. Apart from being issues of social concern, both provide an economy with healthy trained human resources required for economic growth and development. Similarly, health is fundamental to economic growth and development and is one of the key determinants of economic performance both at the micro and macro levels. OILREV is the share of oil revenue and NOILREV is the non-oil revenue that accrued to the federal government of Nigeria over time. Both OILREV and NOILREV are measures of government resources. Anyanwu and Erhijakpor (2007) confirmed that there is a relationship between educational outcomes and resources, although the nature of this relationship varies across studies. He argued, however, that there may be a slightly stronger link between resources and achievement in developing countries, because education systems in developing countries tend to be so severely under-resourced compared to developed countries that marginal increases in resourcing are likely to have much larger impacts on education outcomes than in developed (sic) countries. In this study, it is hypothesized that both OILREV and NOILREV will have positive influence on education enrolment.

DEMO is included as an index for democracy. It is measured as dummy (1=democracy and 0=no democracy). It is argued that democratically-elected governments have a greater incentive to provide the citizens of any country with primary and secondary schooling (Anyanwu and Erhijakpor, 2007; Stasavage, 2005) than the military, authoritarian governments. A priori, it is expected that the effect of DEMO will be positive on enrolment.

Redundancy Test

The redundancy test is aimed at assessing the contributory power, and by implication, the relevance of each slope coefficient to the model. It tests $H_0 : \beta_i = 0$ (parameter estimate is not statistically different from zero) against $H_1 : \beta_i \neq 0$ (parameter estimate is statistically different from zero). The test statistics are the F-statistic and the log likelihood ratio. The F-value has an exact finite sample F-distribution under H_0, if the errors are independent and identically normally distributed random variables. The numerator degrees of freedom are given by the number of coefficient restrictions in H_0. The denominator degrees of freedom are given by the total regression degrees of freedom. The likelihood ratio test is an asymptotic test, distributed as a χ^2, with degrees of freedom equal to the number of excluded variables under H_0. Low probability level ($p<0.05$) will lead to rejection of the H_0 and conclusion that the parameter estimate is not statistically different from zero and as such redundant. Six variants of the dependent variable were estimated: gross primary school enrolment rate ($TPENRR_i$); male primary school enrolment rate ($MPENRR_i$); female primary school enrolment rate ($FPENRR_i$); gross secondary school enrolment rate ($TSENRR_i$); male secondary school enrolment rate ($MSENRR_i$); and female secondary school enrolment rate ($FSENRR_i$). By definition, gross primary and gross secondary enrolment rates measure the number of primary and secondary school pupils and students who actually enrolled as a proportion of the primary and secondary school-age population (IndexMundi, 2015; Anyanwu and Erhijakpor, 2007). All estimates were obtained using the Standard Version of Eviews 7 econometric software.

RESULTS AND DISCUSSION

Descriptive analysis

The descriptive information of the variables used for the six variants of the education enrolment regression model is presented in Table 1. The average number of enrolled primary school pupils is 19.20 million. The enrolment ranged from a minimum of 11.54 million achieved in 1987 to maximum of 29.57 million recorded in 2002. As shown in Figure 1a, there was a persistent drop in primary enrolment between 1983 and 1983 when the lowest level was recorded. Thereafter, a continuous increasing trend followed up to 2002 after which the enrolment figures stagnated, before closing at a relatively

lower level in 2010. The growth rate in primary enrolment is presented in Figure 1b.

Table 1. Descriptive statistics of dependent and explanatory variables

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs.
Dependent										
***TPENRR$_i$* (%)**	91.00	93.08	98.96	78.46	5.58	(0.49)	2.08	2.24	0.33	30
***MPENRR$_i$* (%)**	94.37	96.29	99.18	82.30	4.48	(1.18)	3.43	7.20	0.03	30
***FPENRR$_i$* (%)**	85.53	83.99	99.23	72.44	7.47	0.15	2.12	1.07	0.59	30
***TSENRR$_i$* (%)**	27.69	25.32	43.83	17.01	5.74	0.93	3.66	4.85	0.09	30
***FSENRR$_i$* (%)**	23.87	22.15	41.17	11.55	6.42	0.63	3.62	2.43	0.30	30
***MSENRR$_i$* (%)**	31.29	28.84	46.37	22.30	6.27	0.65	2.33	2.67	0.26	30
Explanatory										
***DEMO$_i$* (0, 1)**	0.56	1.00	1.00	0.00	0.504	-0.24	1.06	5.67	0.06	34
***NGDP$_i$* (N'bn)**	15,578.28	4,110.78	89,043.62	94.33	25,130.45	1.84	5.06	25.24	0.00	34
NGDPK$_i$(Naira)	99,371.11	36,513.57	507,541.1	1,245.55	146,721.9	1.71	4.59	20.15	0.00	34
***NOILREV$_i$* (N'bn)**	661.09	152.65	3,275.12	2.98	940.54	1.49	4.06	14.22	0.00	34
***OILREV$_i$* (N'bn)**	2,149.04	412.80	8,878.97	7.25	2,779.53	1.05	2.70	6.43	0.04	34
***TEXPAGR$_i$* (N'bn)**	44.55	36.06	279.74	0.06	58.51	2.22	9.05	79.76	0.00	34
***TEXPEDU$_i$* (N'bn)**	107.09	23.95	622.24	0.33	154.77	1.76	5.48	26.21	0.00	34
***TEXPHLT$_i$* (N'bn)**	60.12	7.72	389.93	0.13	92.86	1.90	6.28	35.74	0.00	34

Note: The current exchange rate of the naira to the United States Dollar is ₦198.7/US$1

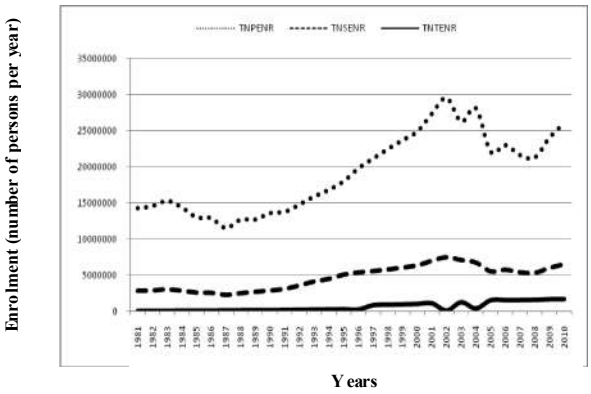

Fig 1a: Primary, secondary and tertiary enrolment, 1981-2010

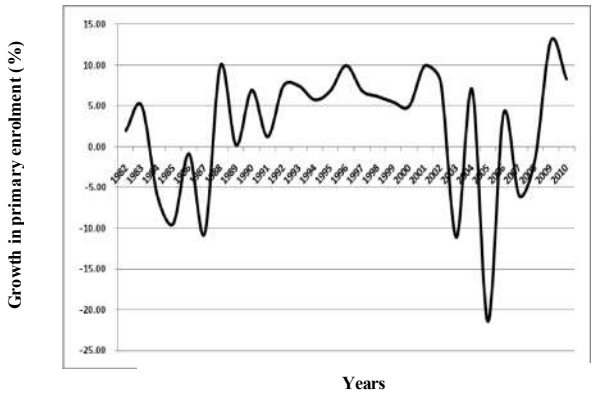

Fig 1b: Growth rate in primary enrolment, 1981-2010

Also, Figure 1a shows the secondary and tertiary levels' gross enrolment figures. The average enrolment was 4.66 million for the secondary and 0.64 million for the tertiary levels of education. Relative to the levels in the 1981 base year, the enrolment figures increased substantially overtime before closing at 6.5 million and 1.7 million respectively in 2010. As shown in Table 1, the average enrolment rate was 91.0% for primary and mere (low) 27.69% for secondary. In terms of gender, the average enrolment rates for the boy were 94.37% for primary and 31.29% for secondary while for the girls they were 85.53% for primary and 23.875 for secondary.

The descriptive information on the explanatory variables is also depicted in Table 1. The average for the gross domestic product (GDP) was ₦15.57 trillion (about US$78.40 billion). The lowest level recorded during the period was ₦94.33 billion (about US$474.73 million) in 1981 while the highest was ₦89.04 trillion (US$448.13 billion) in 2014. In general, the nation's GDP (NGDPi) increased substantially over the years during the period under review. But, the absolute GDP values were not used directly as explanatory variables in this study. Per capita GDP ($NGDPK_i$) was used instead. It was calculated as the value obtained after dividing the true GDP by the population. As also shown in Table 1, the average per capita GDP is ₦99,371.11 (about US$499.60), ranging from ₦1,245.55 (or US$6.26) minimum value recorded in 1981 to ₦507,541.10 (or US$2,551.74) maximum value achieved in 2014. The persistent increase in the per capita GDP recorded overtime resulted from the increasing influence of oil revenue on Nigeria's domestic economic activities. The average oil revenue ($OILREV_i$) and non-oil revenue ($NOILREV_i$) that accrued to Nigeria was ₦2.15 trillion (US$10.80 billion) and ₦661.09 billion (US$3.322 billion) respectively. The associated maximum and minimum values were ₦8.88 trillion (US$44.82 billion) and ₦7.25 billion (US$36.43 billion) for oil revenue and ₦3.37 trillion (US$16.93 billion) and ₦2.98 trillion (US$14.97 billion) for non-oil revenue.

The average annual federal government of Nigeria expenditure on education was ₦107.09 billion (US$538.14 million) against ₦60.12 billion (US$302.11 million) on health services and ₦44.55 billion (US$223.87 million) on agriculture. The dummy variable ($DEMO_i$) shows that 1 for democracy was assigned 56% of the times as against 44% of assignment of 0. Table 1 also shows the Jarque-Bera coefficients and their associated probabilities. The Jarque-Bera is a test statistic for testing whether the series is normally distributed or not. It measures the difference of the skewness and kurtosis of the series with those from the normal distribution and a small probability value leads to the rejection of the null hypothesis of a normal distribution (EViews, 2009). The test has led to the

rejection of the null hypotheses of normality in distribution at 1% for the GDP ($NGDP_i$), non-oil revenue ($NOILREV_i$), expenditure on agriculture ($TEXPAGR_i$), expenditure on education ($EXPEDU_i$), and expenditure on health ($TEXPHLT_i$); 5% for male primary school enrolment rate ($MPENRR_i$) and oil revenue ($OILREV_i$). The implication is that the available data on these set of variables were significantly skewed over time. Usually, the values of the mean and median help in determining the nature and sign of skewness. The statistics could only cause the rejection of the null hypothesis of normality at 10% for gross secondary school enrolment rate ($TSENRR_i$) and democracy index ($DEMO_i$).

Determinants of primary school enrolments

Aggregate primary school enrolment rate

Gross primary school enrolment ratio is the ratio of total enrolment of pupils into primary schools, regardless of their age, to the population of the official primary school age in the year under reference. The implication of this definition is that there is a high probability that the ratio will be very close to or sometimes exceed 1. The output of the regression that considered the rate of primary enrolment is presented in equation (2).

$$\ln(TPENRR_i) = \underset{0.0579}{4.602^{***}} - \underset{0.0064}{0.014^{**}}\ln(NGDPK_i) + \underset{0.0326}{0.117^{***}}\ln(DEMO_i) + \zeta_i \quad \text{(2)}$$
$$(79.388) \quad (-2.157) \quad (3.583)$$

$R^2 = 0.324$; $R^2(Adj.) = 0.275$; $F - value = 6.491$; $P(F) = 0.005$; $DW = 0.760$

(***=significant at 1%; **=significant at 5%; *=significant at 10%; t-values are in parentheses)

The nation's per capita gross domestic product ($NGDPK_i$) and democratic structure ($DEMO_i$) significantly influenced primary enrolment ratio at 5% and 1% respectively. Whereas the effect of democracy was positive, GDPK produced a surprising negative sign. Overall, the model is somewhat weak with the significant variables offering explanation for only 27.5% of the variations in primary enrolment rate implying that there were other variables, which although were relevant to explain variations in enrolment rate were not included in the model. Incidentally, federal government expenditure on education ($TEXPEDU_i$) was among the set of variables that were found to be redundant in this model (Appendix II). Other redundant variables are oil revenue ($OILREV_i$), non-oil revenue ($NOILREV_i$), expenditure on health ($TEXPHLT_i$), and expenditure on agriculture ($TEXPAGR_i$).

Male Primary school enrolment rate

The output on primary education enrolment ratio for boys is presented in equation (3).

$$\ln(MPENRR_i) = \underset{0.0701}{5.126^{***}} - \underset{0.0251}{0.101^{***}}\ln(NGDPK_i) + \underset{0.0189}{0.073^{***}}\ln(OILREV_i) + \zeta_i \quad \text{(3)}$$
$$(68.804) \quad (-4.018) \quad (3.853)$$

$R^2 = 0.380$; $R^2(Adj.) = 0.334$; $F - value = 8.297$; $P(F) = 0.002$; $DW = 1.657$

(***=significant at 1%; **=significant at 5%; *=significant at 10%; t-values are in parentheses)

The result, like what obtained in the case of gross primary enrolment rate, revealed the negative influence of the per capita GDP ($NGDPK_i$) on boys enrolment rate. However, unlike the gross enrolment rate, which identified democracy as significant and positive, this model on boys' enrolment rate revealed the positive effect of oil revenue ($OILREV_i$). The two variables ($NGDPK_i$ and $OILREV_i$) together explained 33.4% of the variations in boys' enrolment rate (adj. R^2=0.334; F-value=8.28; p(F)<0.01), meaning that there were other relevant variables that would have been included in the model to raise its explanatory power. Democracy ($DEMO_i$), non-oil revenue ($NOILREV_i$), expenditure on health (TEXPHLT), expenditure on agriculture ($TEXPAGR_i$) and expenditure on education ($TEXPEDU_i$) proved to be redundant and were dropped out of the model (Appendix I).

Female Primary school enrolment rate

The output equation for the primary enrolment ratio for girls is presented in equation (4).

$$\ln(FPENRR_i) = \underset{0.0188}{4.408^{***}} - \underset{0.0075}{0.018^{**}}\ln(\text{TEXPHLT}_i) + \underset{0.0500}{0.192^{***}}\ln(DEMO_i) + \zeta_i \quad \text{(4)}$$
$$(234.156) \quad (-2.397) \quad (3.838)$$

$R^2 = 0.353$; $R^2(Adj.) = 0.305$; $F - value = 7.370$; $P(F) = 0.002$; $DW = 1.029$

(***=significant at 1%; **=significant at 5%; *=significant at 10%; t-values are in parentheses)

It revealed that government expenditure on health services ($TEXPHLT_i$) and democracy ($DEMO_i$) were the two variables having significant positive influence on primary enrolment ratio for girls during the period under review. $DEMO_i$ was significant at 1% with a positive sign while $TEXPHLT_i$ was significant at 5% with a negative sign. The variables together accounted for 30.50% of the explanatory power (adj. R^2=0.305; F-value=7.37; p(F)<0.01), revealing the weakness of the model. The variables excluded from the model because they failed the redundancy tests (Appendix I) are per capita GDP ($NGDPK_i$), expenditure on education ($TEXPEDU_i$), oil revenue ($OILREV_i$), non-oil revenue ($NOILREV_i$), and expenditure on agriculture ($TEXPAGR_i$).

Total secondary school enrolment rate

The estimated equation of the aggregate secondary school enrolment ratio is presented in equation (5).

$$\ln(TSENRR_i) = \underset{0.275}{1.128^{***}} + \underset{0.032}{0.245^{***}}\ln(NGDPK_i) - \underset{0.021}{0.121^{***}}\ln(TEXPAGR_i) + \zeta_i \quad \text{(5)}$$
$$(4.102) \quad (7.736) \quad (-5.801)$$

$R^2 = 0.745$; $R^2(Adj.) = 0.726$; $F - value = 39.485$; $P(F) = 0.000$; $DW = 1.355$

(***=significant at 1%; **=significant at 5%; *=significant at 10%; t-values are in parentheses)

The significant variables were two: per capita GDP ($NGDPK_i$) and total expenditure on agriculture ($TEXAGR_i$). Each variable was significant at 1%, but $NGDPK_i$ returned a positive relationship while $TEXPAGR_i$ gave a negative relationship. The contributory power of both variables to the variation in the model was high at 72.6%. Also, the model was highly significant (adj. R^2=0.726; F-value=39.48; p(F)<0.01) indicating that the retained variables were substantially relevant in the model. The variables that could not enter the model were democracy ($DEMO_i$), oil revenue ($OILREV_i$), non-oil revenue ($NOILREV_i$), expenditure on education ($TEXPEDU_i$), and expenditure on health and health facilities ($TEXPHLT_i$), which individually and collectively failed the redundancy tests and were consequently dropped.

Male secondary enrolment rate

The estimated equation for boys' secondary school enrolment ratio is presented in equation (6).

$$\ln(MSENRR_i) = \underset{0.357}{1.403^{***}} + \underset{0.041}{0.232^{***}} \ln(NGDPK_i) - \underset{0.027}{0.134^{***}} \ln(TEXPAGR_i) + \zeta_i \quad \text{(6)}$$

$$(3.929) \quad (5.633) \quad (-4.943)$$

$$R^2 = 0.549; \quad R^2(Adj.) = 0.515; \quad F-value = 16.425; \quad P(F) = 0.000; \quad DW = 0.972$$

(***=significant at 1%; **=significant at 5%; *=significant at 10%; t-values are in parentheses)

It also returned the significant variables as per capita GDP ($NGDPK_i$) and total expenditure on agriculture ($TEXAGR_i$). Like the case of aggregate enrolment rate, the former was significant at 1% with a positive sign while the latter was also significant at 1% level with a negative sign. The contributory power of both variables to the variation in the model was above 51%. Also, the model was significant (adj. R^2=0.515; F-value=16.42; p(F)<0.01); indicating that the retained variables were substantially relevant in the model. The variables that individually and collectively failed the redundancy tests and were consequently dropped out of the model were democracy ($DEMO_i$), oil revenue ($OILREV_i$), non-oil revenue ($NOILREV_i$), expenditure on education ($TEXPEDU_i$), and expenditure on health and health facilities ($TEXPHLT_i$).

Female secondary enrolment rate

With respect to girls' secondary school enrolment ratio, the regression result is presented in equation (7).

$$\ln(FSENRR_i) = \underset{0.326}{0.656^{**}} + \underset{0.038}{0.277^{**}} \ln(NGDPK_i) - \underset{0.024}{0.096^{***}} \ln(TEXPAGR_i) - \underset{0.074}{0.139^{*}} \ln(DEMO_i) + \zeta_i \quad \text{(7)}$$

$$(2.011) \quad (7.309) \quad (-3.12) \quad (-1.865)$$

$$R^2 = 0.822; \quad R^2(Adj) = 0.802; \quad F-value = 40.061; \quad P(F) = 0.000; \quad DW = 1.390$$

(***=significant at 1%; **=significant at 5%; *=significant at 10%; t-values are in parentheses)

The result also revealed that per capita GDP ($NGDPK_i$) and total expenditure on agriculture ($TEXAGR_i$) were significant at 5% and 1% levels respectively. In addition, democracy was also significant at 10% level. $NGDPK_i$ returned a positive sign while both $TEXPAGR_i$ and $DEMO_i$ had negative signs. The overall model was highly significant (adj. R^2=0.802; F-value=40.061; p(F)<0.01), indicating that the retained variables were able to explain over 80% of the variation in the model. The variables that individually and collectively failed the redundancy test (Appendix II) and were dropped out of the model were oil revenue ($OILREV_i$), non-oil revenue ($NOILREV_i$), expenditure on education ($TEXPEDU_i$), and expenditure on health ($TEXPHLT_i$).

Responsiveness of human capital indicators

To examine the reaction of each of the dependent variables in the above reported models, we analyzed the estimated elasticity coefficients. As the power function was estimated throughout, the absolute values of the returned parameter estimates were equivalent to the elasticity coefficients as presented in Table 2. The discussion will be limited to the significant variables (p<0.05).

Table 2. Elasticity coefficients for variables associated with school enrolment models

Model	Elasticity Coefficients of variables				
	$TEXPAGR_i$	$NGDPK_i$	$DEMO_i$	$OILREV_i$	$TEXPHLT_i$
***TPENRR**i*		0.014^{**}	0.117^{***}		
***MPENRR**i*		0.101^{***}		0.073^{***}	
***FPENRR**i*			0.192^{***}		0.018^{**}
***TSENRR**i*	0.121^{***}	0.245^{***}			
***MSENRR**i*	0.134^{***}	0.232^{***}			
***FSENRR**i*	0.096^{***}	0.277^{***}	0.139^{*}		

***=significant at 1%; **=significant at 5%; *=significant at 10%

As presented on the Table 2, the variables associated with the gross primary enrolment rate were democracy and per capita GDP. Each variable was significant and had positive influence. It showed that a 1% increase in NGDPK, DEMO taken as constant, would result to a 0.01% increase in enrolment ratio while a similar 1% increase in effort at sustaining democracy, NGDPK being held constant, would result to a 0.12% increase in total enrolment ratio. The primary enrolment ratio for boys was influenced positively by oil revenue, but negatively by per capita GDP. Ceteris paribus, a percentage increase in OILREV would result to a 0.07% increase in boys' enrolment ratio, but a similar 1% increase in NGDPK would lead a 0.10% decrease in boys' enrolment ratio. For girls, primary enrolment ratio responded positively to DEMO, but negatively to government expenditure on health (TEXPHLT). Whereas a percentage positive step towards democratizing, TEXPHLT being held constant, increased girls enrolment ratio by 0.19%, a similar 1% increase in government expenditure on health (TEXPHLT), DEMO being considered constant, would cause a 0.02% decrease in girls' enrolment ratio. Aggregate enrolment ratio tended to increase by 0.24% for 1% increase in NGDPK and drop by 0.12% for 1% increase in TEXPAGR. For boys, enrolment ratio increased by 0.23% for 1% increase in NGDPK (TEXPAGR being held constant) and dropped by 0.13% for 1% increase in per capita GDP. Girls' secondary school enrolment ratio followed a similar trend with the ratio increasing by 0.27% for 1% increase in NGDPK and dropping by 0.09% for 1% increase in agriculture expenditure (TEXPAGR), other things being equal. In general, the

elasticity coefficients revealed that changes in the variables had resulted to less than proportionate rates of change in school outcomes.

Discussion and implication of findings

This study has among other things revealed the effect of sustaining democracy and democratic virtues on primary education outcome in Nigeria. The influence of the variable was positive for the aggregate enrolment ratio as well as enrolment ratio for girls. It suggests that under democracy parents consider it safer to enroll their children and wards into the early schools. The important role of democracy, particularly for primary education enrolment, has also been reported by Anyanwu and Erhijakpor (2007). They observed that exclusion of this vital role democracy could play in previous studies could help to explain why such studies had found a generally weak relationship between education expenditure and education enrolment. Apart from consolidating and sustaining democracy, they also affirmed that other policy interventions accelerating national income had better chances of leading to positive educational outcomes towards meeting the millennium development goals (MDGs). Carsamer and Ekyem (2015) also argued that political instabilities decreased school enrolment.

Federal government expenditure on agriculture (TEXPAGR) also had a significant positive influence on gross primary enrolment (GPENR), gross secondary enrolment (GSENR). It implies that government investment in agriculture as an economic service activity could have a positive spill-over effect on human capital development in the early school years. This could result from the fact that more investment would tend to expansion of the agriculture sector through introduction and adoption of improved seeds/inputs and improved farming technologies by the rural farmers. In response, the farmers would lend to have less need for engaging the labour services of the young children in their farms and instead would encourage them to enroll in schools. Also, use of modern techniques and systems would result to higher gains from agriculture empowering the parents and guardians more to meet up with the financial responsibilities associated with their children and wards' schooling.

It is, perhaps interesting that the influence of expenditure on agriculture is negative for enrolment in the relatively higher secondary school education systems. As the result has revealed, the sign associated with the variable was negative for aggregate secondary enrolment ratio, and secondary enrolment ratios for boys and girls. The implication of this is that as the levels of education became higher, enrolment tended to decrease as government spending on agriculture increases. This scenario is not in conformity with our a priori expectation, but could arise from the age-long apathy or lack of interest of the Nigerian youth and adolescents in agriculture and agri-based activities as means of livelihoods. It is usual for most young people in Nigeria to opt for quicker means of livelihood and would prefer not to enroll at all into the grammar school or to drop out during the early years.

The study revealed that the influence of an increase in the per capita GDP was positive on the aggregate primary enrolment ratio (TNENRR), aggregate secondary enrolment ratio (TSENRR), secondary enrolment ratios for boys (MSENRR) and girls (FSENRR). However, the effect on the male primary school enrolment ratio was surprisingly negative. Its positive influence on the human capital indexes is in conformity with our a priori expectation and also consistent with (Anyanwu and Erhijakpor, 2007). Elsewhere, it has also been reported that per capita income had strong positive impact on secondary education enrolment (Al-Samarrai, 2003; Baldacci *et al*., 2004; Roberts, 2003), a view also corroborated by Carsamer and Ekyem (2015) who identified per capita income as a channel through which the universal basic education could be achieved. By implication, the citizens demonstrated an understanding of the need to invest more in the education of their children and wards with their increasing incomes. This is in acknowledgement of schooling as a major investment in human capital with propensity of enhancing later career opportunities and wages, and creating an avenue for escaping poverty and reducing income inequality in the long run (Olaniyan, 2011; Binder, 1998). Though unexpected, the negative influence of per capita GDP on male primary enrolment ratio could have resulted from misuse of male children for child labour, engagement in menial job and street trading, rather than enrolling them into schools, even as household incomes increased. The street trading practice among young boys still persists in many urban and semi urban cities across the country with its negative consequences.

Of the two government revenue source components, only the oil revenue appeared significant with positive influence. The second revenue component, revenue from non-oil sources, was found to be redundant in all the models, revealing its insignificance. The oil revenue positively affected male primary enrolment ratio, for boys. The finding agreed with our a priori expectation that increase in the nation's resources would have a positive effect on school enrolment if appropriately applied towards the development of education through provision of enabling environment for teaching and learning. In Pakistan, Bashir *et al*. (2011) also investigated the influence of government revenue and other set of variables on school enrolment, but found to the contrary that revenue inversely impacted on enrolments at different levels of education.

Perhaps, the most astounding of the outcomes of this current investigation is the impact of government expenditure on education and health on school enrolments in Nigeria. The former was grossly redundant among the set of variables emerging as drivers of education enrolment at the primary, secondary education levels. The latter only emerged as having a negative effect on female primary school enrolment ratio. The result of this investigation suggests that there is a complete disconnect between government spending on education and health on educational outcome, measured by school enrolment ratios. This finding corroborate earlier studies (including Baldacci *et al*., 2004; Al-Samarrai, 2003; Anand and Ravallion, 1993). In the case of Baldacci *et al*. (2004), it was argued that African countries tend to achieve lower education outcomes for given levels of spending measured by expenditure on education as a ratio of GDP. Also, in a study of Botswana, Malawi and Uganda, Al-Samarrai (2003) confirmed

from his cross-country findings that the link between public spending and primary school access was weak while Anand and Ravallion (1993) concluded that there was no significant relationship between education outcomes and public spending on education. However, these conclusions were in variance with Anyanwu and Erhijakpor (2007) whose study on the effects of government education expenditure on enrolments at the primary and secondary school levels using illustrations from panel data on four African countries (South Africa, Algeria, Nigeria, and Egypt) from 1990-2002 affirmed that government expenditure on education had a positive and significant direct impact on primary and secondary education enrolment rates. Their conclusion was supported by another Kenyan study that used household data to establish a positive and significant relationship between school spending and primary school enrolment (Deolalikar, 1997).

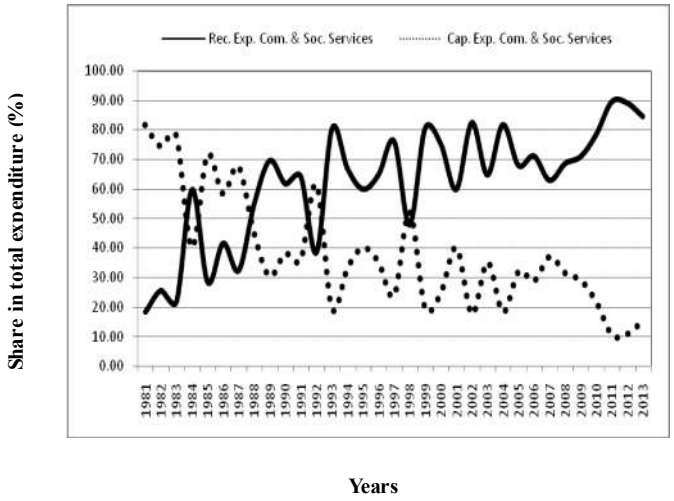

Fig. 2: Capital and recurrent education expenditure as percentage of total education expenditure, 1981-2013

Part of the reasons with explaining the observed disconnect is the pattern of government expenditure on social and community service, which in recent years tended to favour the recurrent expenditure more than the capital expenditure. Education and health are major components of the social and community services sector in Nigeria. As shown in Figure 2, the capital expenditure share of spending on this sector had decreased drastically over time from about 80% in the early 1980s to as low as about 15% in 2013. The implication of this is that even as monetary value seemed to have increased in absolute terms over time, the physical infrastructures in the schools and health centers had continued on the deteriorating trend without being repaid let alone constructing new ones. This situation of infrastructural decay had created an atmosphere that was not very conducive for efficient teaching and learning in the public schools, causing parents and guardians with the way withal to withdraw their wards for placement in preferred private primary and secondary schools.

Conclusion

The drivers of human capital development were investigated using data on school enrolment at various levels of education in Nigeria from 1981-2014. The study revealed that democracy, per capita GDP and oil revenue had predominantly exerted positive influence on enrolment at various levels while the influence of government expenditure on agriculture was somewhat mixed. Government expenditure on education, health and health care, and non-oil revenue did not have desired impact on enrolment at different levels of education. In fact, the disconnect between school enrolment and expenditure on education and health was worrisome given the expectation that these two factors were to serve as education growth hobs in any economy. The spending over the years might not have been rightly directed as to achieve the desired impact as reflected in the most recent trend whereby greater share of the spending were on recurrent to the detriment of capital expenditure. This study supports all positive efforts being directed towards the sustenance of the nation's democracy and democratic institutions. It also shares the popular opinion on the need for government's continued funding of education especially at the lower levels in Nigeria. However, there is an additional need to redefine priorities for public sector investment in the Nigerian education system. The governments at different levels should direct sufficient funds towards upgrading and developing of the constantly diminishing infrastructures in government schools across the country. Furthermore, deliberate policy instruments should be used to provide the desired incentives to parents and school-age children to seek enrolment into schools, especially the public schools. The present administration's planned policy of providing free meals to pupils and students could prove a step in the right direction. In addition, we recommend establishment of mini medical clinics in public primary and secondary schools across the country to cater for the immediate health care needs of pupils and students during school periods.

REFERENCES

Ademola, I.S., Olasode, O.S. and Raji, O.A. 2015. Government expenditure, oil revenue and economic growth in Nigeria. *International Journal of Economics, Commerce and Management*, III (5): 180-202.

Almendarez, L. 2010. Human Capital Theory: Implications for Educational Development. Paper Presented at the Belize Country Conference, November 21-24, 2010. The University of the West Indies, 2002. http://www.open.uwi.edu/sites/default/files/bnccde/belize/conference/papers2010/almendarez.html, accessed 30 December 2015.

Al-Samarrai, S. 2003. Financing primary education for all: public expenditure and education outcomes in Africa. Institute of Development Studies (IDS), University of Sussex, United Kingdom, http://r4d.dfid.gov.uk/pdf/outputs/forall/paper57.pdf.

Anand, S. and Ravallion, M. 1993. "Human Development in Poor Countries: On the Role of Public Services" *Journal of Economic Perspectives,* 7 (1): 135-50.

Anyanwu, J.C. and Erhijakpor, A.E.O. 2007. Education Expenditures and School Enrolment in Africa: Illustrations from Nigeria and Other SANE Countries. African Development Bank Economic Research Working Series No. 92, African Development Bank.

Babalola, J.B. 2003. Budget Preparation and Expenditure Control in Education. In: Babalola, J.B. (ed) Basic Text in Educational Planning. Ibadan: Awemark Industrial Printers. As cited in: Olaniyan, D.A. and Okemakinde, T. (2008). Human Capital

Theory: Implication for Educational Development. Pakistan *Journal of Social Sciences*, 5 (5): 479-483.

Baker, D. and LeTendre, G. 2005. *National Differences, Global Similarities: World Culture and the Future of Schooling*., Stanford University Press: Stanford, CA. In: Mitra, D. 2011. Pennsylvania's Best Investment: The Social and Economic Benefits of Public Education, Education Law Center, The Schott Foundation for Public Education, Cambridge. Downloaded from official website: http://schottfoundation .org/resources/pennsylvanias-best-investment-social-and-economic-benefits-public-education, accessed 5 January 2016.

Baldacci, E., Clements, B., Gupta, S. and Cui, Q. 2004. Social Spending, Human Capital, and Growth in Developing Countries: Implications for Achieving the MDGs. IMF Working Paper, WP/04/217, Washington DC, pp. 1-39.

Baldacci, E., Guin-Sui, M.T. and de Mello, L. 2002. More on the Effectiveness of Public Spending on Health Care and Education: A Covariance Structure Model. IMF Working Paper, WP/02/90, International Monetary Fund, Washington, DC, pp. 1-31.

Baldacci, E., Guin-Sui, M.T. and de Mello, L. 2003. More on the Effectiveness of Public Spending on Health Care and Education: A Covariance Structure Model. *Journal of International Development*, 15: 709–725.

Barnett, S.W. 2008. Why Government Should Invest in Early Education. CESifo DICE Report, Volume 6, Number 2, 2008, pp. 9-14. http://core.ac.uk/download/files/153/663 0977.pdf, accessed 4 January 2016.

Bashir, F., Nawaz, S., Ullah, R., Arshad, M.R., Bagum, M., Sandila, M.A. and Raza, J. 2011. Attainment of higher enrollment rates in Pakistan: a macroeconomic and econometric study. *Australian Journal of Business and Management Research*, 1 (7): 17-29.

Becker, G. S. 1993. "*Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education*." University of Chicago Press.

Binder, M. 1998. Family background, gender and schooling in Mexico. *Journal of Development Studies*, 35(2): 54-71.

Bontis, N., Dragonetti, N. C., Jacobsen, K., Roos, G. 1999. The Knowledge Toolbox: A Review of Tools Available to Measure and Manage Intangible Resources. *European Management Journal*, 17 (4): 391-402.

Bowale, E.I.K. and Aremo, A.G. 2006. Effect of Public Education Expenditure on Primary School Enrolment in Nigeria. *(ABSU) Journal of Accounting and Finance*, Vol. 1, No. 1.

Carsamer, E. and Ekyem, E. 2015. An empirical analysis of government educational expenditure on enrolments at primary and secondary school levels in Africa. *International Journal of Economics, Commerce and Management*, III (7): 273-294.

CBN 2015. Statistical Bulletin of the Central Bank of Nigeria. Downloaded from the CBN Official Website, http://www.cenbank.org, 5 November 2015.

Dauda, R.O.S. 2011. Effect of Public Educational Spending and Macroeconomic Uncertainty on Schooling Outcomes. *Journal of Economics, Finance and Administrative Science*, 16 (31): 7-21.

Deolalikar, A. B. 1997. The Determinants of Primary School Enrolment and Household Expenditure in Kenya: Do They Vary by Income? An earlier version of this paper was presented at the Workshop on Determinants of Educational Attainments in Sub-Saharan Africa held on 2 December 1996 at the Academy for Educational Development, Washington, D.C. Accessed online at https://csde. washington.edu/ downloads/97-7.pdf, 1 January 2016.

Devi, S. and Devi, A. 2014. Determinants of School Enrolment in Pakistan. *Journal of Education and Practice*, 5 (17): 74-82.

EViews 2009. EViews 7 User's Guide I, Quantitative Micro Software, LLC, 4521 Campus Drive, #336, Irvine CA, 92612-2621

Fagerlind, A. and Saha, L.J. 1997. *Education and national developments*. New Delhi, Reed Educational and Professional Publishers Ltd.

FME 2015. "Nigeria: Education for All 2015 National Review." A document prepared and submitted by the Federal Ministry of Education for the World Education Forum, Incheon, Republic of Korea, 19-22 May 2015, in response to UNESCO's invitation to its Member States to assess progress made since 2000 towards achieving Education for All (EFA), Available on the Official UNESCO website: http://unesdoc.unesco.org/ images/0023/ 002310/231081e.pdf, accesses 13 December 2015.

Frank, R. H. and Bernanke, B. S. 2007. Principles of Microeconomics (3rd ed.). New York: McGrawHill/Irwin. In: Kwon, D. 2009. Human Capital and Its Measurement. The 3rd OECD World Forum on "Statistics, Knowledge and Policy" Charting Progress, Building Visions, Improving Life Busan, Korea, 27-30 October 2009, pp. 1-23. http://www.oecdworldforum2009.org.

Global Corp 2009. Nigeria's Agriculture, Global Corp Limited. Downloaded from the Official website: http://www.globalcorplimited.com/nigeriasagriculture. html, accessed on February 18, 2013.

Gupta, S., Verhoeven, M., and Tiongsan, E.R. 1999. *Does Higher Spending Buy Better Results in Education and Health Care?* (IMF Working Paper WP/99/21) Washington, D. C.: International Monetary Fund.

Gupta, S., Verhoeven, M., and Tiongson, E.R. 2002. The Effectiveness of Government Spending on Education and Health Care in Developing and Transition Economies. *European Journal of Political Economy*, 18 (4): 717–737.

IndexMundi 2015. Nigeria school Enrolment, Index Mundi Official Website: http://www.indexmundi.com/facts/ nigeria. Accessed, 4 December 2015.

Khandker, R.S., Lavy, V. and Filmer, D. 1994. "Schooling and cognitive achievements of children in Morocco: Can the government improve outcomes?" World Bank Discussion Paper 264. The World Bank, Washington, D.C.

Kucharčíková, A. 2011. Human Capital – Definitions and Approaches. *Human Resources Management and Ergonomics,* 2: 60-70. ISSN 1337-0871.

Kucharčíková, A. 2013. Managerial approaches to understanding the human capital. *Human Resources Management and Ergonomics*, 1: 33-44.

Kwon, D. 2009. Human Capital and Its Measurement. The 3rd OECD World Forum on "Statistics, Knowledge and Policy" Charting Progress, Building Visions, Improving Life Busan, Korea, 27-30 October 2009, pp. 1-23. http://www.oecdworldforum2009.org.

Mingat, A. and Tan, J. P. 1992. *Education in Asia: A Comparative Study of Cost and Financing*. Washington, D. C.: World Bank.

Mitra, D. 2011. Pennsylvania's Best Investment: The Social and Economic Benefits of Public Education, Education Law Center, The Schott Foundation for Public Education, Cambridge. Downloaded from official website: http://schottfoundation.org/resources/pennsylvanias-best-investment-social-and-economic-benefits-public-education, accessed 5 January 2016.

Noss, A. 1991. *Education and Adjustment: A Review of the Literature*. (PREM Working Paper WPS 701). Education and Employment Division, Population and Human Resources Department, World Bank, Washington, D. C.: World Bank. pp. 68.

Odia, A.A. 2014. A study of factors influencing students' enrolment in social studies education at the post-secondary school level in Nigeria. *Asian Journal of Management Sciences & Education,* 3 (2): 116-124.

OECD/UIS 2003. Financing Education – Investments and Returns, Analysis of the World Education Indicators 2002 Edition. In: In: Anyanwu and Erhijakpor, J.C. 2007. Education Expenditures and School Enrolment in Africa: Illustrations from Nigeria and Other SANE Countries. AfBD Economic Research Working Series No. 92, African Development Bank.

OECD/UIS 2006. Education Counts: Benchmarking Progress in 19 WEI Countries, World Education Indicators, 2006. In: Anyanwu and Erhijakpor, J.C. 2007. Education Expenditures and School Enrolment in Africa: Illustrations from Nigeria and Other SANE Countries. AfBD Economic Research Working Series No. 92, African Development Bank.

Olaniyan, O. 2011. Determinants of Child Schooling in Nigeria. AERC Research Paper 217 African Economic Research Consortium, Nairobi, Kenya.

Psacharopoulos, G. and Woodhall, M. 1997. *Education for Development: An Analysis of Investment Choice*. New York: Oxford University Press. In: Almendarez, L. 2010. Human Capital Theory: Implications for Educational Development. Paper Presented at the Belize Country Conference, November 21-24, 2010. The University of the West Indies, 2002. Last revised 22nd December, 2011. http://www.open.uwi.edu/sites/default/files/bnccde/belize/conference/papers2010/almendarez.html.

Roberts, R. 2003. Poverty Reduction Outcomes in Education and Health Public Expenditure and Aid. Working Paper 210, Centre for Aid and Public Expenditure, Overseas Development Institute (ODI), London. http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2450.pdf., accessed 1 January 2016.

Schulz, T. W. 1981. Investing in People. The Economics of Population Quality. Berkeley. University of California Press. In: Kucharčíková, A. 2011. Human Capital – Definitions and Approaches. *Human Resources Management & Ergonomics* V(2): 60-70. ISSN 1337-0871.

Stasavage, D. 2005. "Democracy and Primary School Attendance: aggregate and Individual Level Evidence from Africa, Afrobarometer Working Paper 54.

Torruam, J.T. 2014. Public Expenditure on Human Capital Development as a Strategy for Economic Growth in Nigeria: Application of Co Integration and Causality Test Analysis. *International Journal of Research in Humanities and Social Studies*, 1 (2): 14-23.

Volejníková, J. 2005. Moderní kompendium ekonomických teorií od antických zdrojů až po 3. tisíciletí. Praha. Profess Consulting 2005, 378. In: Kucharčíková, A. 2011. Human Capital – Definitions and Approaches. *Human Resources Management & Ergonomics,* V(2): 60-70. ISSN 1337-0871.

Appendix I: Output of redundancy test of variables

Model	Null hypotheses	Test statistics		Decision*	Redundant variables (with β_is=0)	Significant (retained) variables (β_is≠0)
		F-value (probability)	Log-likelihood (probability)			
Model 1: *TPENRR$_i$*	H_0: $\Sigma b_i=0$, i=1,....5	1.1327 (0.3726)	6.8723 (0.2303)	Accept H_0	*lnTEXPAGR$_i$; lnOILREV$_i$; lnNOILREV$_i$; lnTEXEDU$_i$; lnTEXPHLT$_i$*	*lnNGDP$_i$; lnDEMO$_i$*
Model 2: *MPENRR$_i$*	H_0: $\Sigma b_i=0$, i=1,....5	0.8479 (0.5307)	5.2871 (0.3817)	Accept H_0	*lnNGDP$_i$; lnDEMO$_i$; lnNOILREV$_i$; lnTEXEDU$_i$; lnTEXPHLT$_i$*	*lnTEXAGR$_i$; lnOILREV$_i$*
Model 3: *FPENRR$_i$*	H_0: $\Sigma b_i=0$, i=1,....5	1.4162 (0.2574)	8.3712 (0.1369)	Accept H_0	*lnTEXPAGR$_i$; lnOILREV$_i$; lnNOILREV$_i$; lnTEXEDU$_i$; lnNGDP$_i$*	*lnTEXPHLT$_i$; lnDEMO$_i$*
Model 4: *TSENRR$_i$*	H_0: $\Sigma b_i=0$, i=1,....5	0.6567 (0.6597)	4.1735 (0.5247)	Accept H_0	*lnDEMO$_i$; lnOILREV$_i$; lnNOILREV$_i$; lnTEXEDU$_i$; lnTEXPHLT$_i$*	*lnNGDP$_i$; lnTEXAGR$_i$*
Model 5: *MSENRR$_i$*	H_0: $\Sigma b_i=0$, i=1,....5	1.5379 (0.2190)	8.9928 (0.1094)	Accept H_0	*lnDEMO$_i$; lnOILREV$_i$; lnNOILREV$_i$; lnTEXEDU$_i$; lnTEXPHLT$_i$*	*lnNGDP$_i$; lnTEXPAGR$_i$*
Model 6: *FSENRR$_i$*	H_0: $\Sigma b_i=0$, i=1,....5	0.8485 (0.5097)	4.3042 (0.3664)	Accept H_0	*lnDEMO$_i$; lnOILREV$_i$; lnNOILREV$_i$; lnTEXEDU$_i$; lnTEXPHLT$_i$*	*lnNGDP$_i$; lnTEXPAGR$_i$*

*Values in parentheses are probabilities; high probability values (p>0.05) had led to our not rejecting (accepting) each null hypothesis (H_0) and consequently concluding that each parameter estimate was not statistically different from zero and could be considered redundant.

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