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# The determinants of public expenditure on educational infrastructural facilities and economic growth in Nigeria

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Public expenditure on education is of great importance to any national development and plays a critical role in promoting growth and equity, and through both channels, help to reduce poor quality as well as improving the standard of education. In Nigeria over the years, poor financial resources to the educational sector have been a major problem in the educational system. Poor financing of the educational sector has resulted to poor attendance, poor quality of students, inadequate preparation by teachers at all levels and low morale of teachers as a result of low basic condition of services and low salaries. The major objective of this study is to examine the Determinants of public expenditure on Infrastructural facilities in education and economic growth in Nigeria based on time series data on variables considered relevant indicators of economic growth and public expenditure. A public expenditure model was constructed and tested using the ordinary least squares (OLS) technique. A dummy variable was introduced to test the expenditure variability between regime changes (military and civilian) to ascertain which regime allocated more funds to the educational sector in Nigeria during the period under the study. Data for the study was obtained from the Central Bank of Nigeria, NBS and the World Bank. Results of the analysis showed that public expenditure on education has a significant impact on economic growth. But expenditure on education is different between regimes but not significant. Consequently, in model (1), Adult Enrolment ratio (AER) influenced Real Gross Domestic Product (RGDP) by 540.4365 at a unit change, and AER is not a good predictor of economic growth, while in some it does, while model (2) result showed that expenditure in education during the civilian regime had the intercept of 22932.02, the military regime spent 22927.89 more than the civilian regime in Nigeria.

**Keywords:** Economic Growth, Public Expenditure, Educational Infrastructure, Military, Civilian regimes.

**JEL Classification:** C32, O13, O21, O54.

## INTRODUCTION

It is well and widely accepted that infrastructure is a key to economic growth. Infrastructure contributes to economic growth by increasing productivity, low unit cost of production and enhances the quality of life. Investment in infrastructure can contribute to sustainable growth in enhancing human capital, through improved access to schools (DFID, 2002).

According to the United Nation (2006), under the right conditions, infrastructural development can play a major role in promoting growth and equity, and through both channels, help to reduce poor quality of students.

In spite of this universally acknowledged attributes and importance, Sub-Saharan Africa (SSA) trails behind other regions in infrastructure service delivery and quality, with the gap widening over time.

Alabi et al. (2008), asserted that Nigeria generated about 23 trillion naira (191 billion US dollars) from oil between 1981 and 2006, which is around 83 percent of

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total government revenue, about 2 percent and 3 percent of total government revenue and oil revenue was spent on education. However they stated that government allocated only 1 percent of the Gross Domestic Product (GDP) to education. Abidogun (2008) indicated that 0.76 percent of Gross National Product (GNP) allocated to education sector in Nigeria is lower than the average of 4.5 percent of GDP allocated to education sector in Sub-Saharan African countries and lower when compared with the average of 6 percent of GDP allocated to education sector by OECE countries.

Against this background, it is important to review the changes that have taken place in the educational sector of Nigeria and the composition of public expenditure and to determine if they are responsible for economic growth in Nigeria. The objective of this study, therefore, is to examine the impact of public expenditure on education and economic growth in Nigeria. In addition, the study aims at examining how public expenditure has affected education in the country.

### Statement of the problem

Poor financial resources to the educational sector have been a major problem in the Nigeria educational system. The Federal Ministry of Education (2003) agreed that 1978-1999 period was an ill period for Nigeria education system due to instability and financial inadequacies which resulted to largely general economic downturn of the 1980s. Federal Government expenditure on education has been below 10 percent of the overall expenditure, 70 percent of its expenditure goes to recurrent activities. The above expenditure figure is below UNESCO recommendation of 29 percent of national expenditure which should be devoted to education.

There has been huge increase in the number of student intake at all levels of education- primary, secondary and tertiary. However, actual expenditure level falls short of the budgetary allocation.

CBN (2000) and Okebukola (2005) rightly observed that poor financial investment has been the bane of Nigerian educational system.

Against this backdrop, the funding formula of the educational sector was reviewed and is still undergoing review by the government and stakeholders in the educational sector. According to the 1994 funding formula of the educational sector, states would share 50 percent equally; educationally disadvantage states 25 percent, pupil enrolment 25 percent and population of the state 10 percent. Alternative sources of funding education explored by the government are the Education Tax Fund (ETF) established in 1995, Petroleum Trust Fund (PTF). ETF ensures that companies with more than 100 employees contribute 2 percent of their pre-tax earnings to the fund. Under this scheme, primary education receives 40 percent, secondary education

receive 10 percent and higher education 50 percent. Primary education has in the past also receives from Petroleum Trust Fund (PTF) for capital expenditure and provision of instructional materials in higher institution, gifts, endowment funds, consultancy services, farms, satellites campuses etc are other alternative of funding.

Despite all the alternatives and the recommendation of UNESCO, the public expenditure on education remains inadequate for coping with a system that is growing at every rapid pace. Due to poor financing the quality of education offered is affected by poor attendance and inadequate preparation by teachers at all levels. The morale of teachers is low as a result of basic condition of services and low salaries. Access to education is further compounded by over subscription. Thus, 15-30 percent of the infrastructure, equipment and books are non-functional, obsolete or dilapidated (Federal Ministry of Education, 2009).

Evident from the above synthesis is that funding mechanism for education in Nigeria need be developed for the country to become a serious player in the new global economic, social and political order.

### Objectives of the study

The broad objective of the study is to examine the impact of public expenditure in education on economic growth in Nigeria. The following specific objectives will guide the researcher to actualize this goal:

- To examine the extent to which public expenditure on education leads to economic growth in Nigeria.
- To prioritize public expenditure on educational infrastructure according to their relative contributions to economic growth.
- To examine the impact of public expenditure in education on economic growth at different regimes in Nigeria under the period of study.
- To proffer policy measures (recommendations) that will encourage infrastructural facilities development in the educational sector in Nigeria.

### Research questions

The following research questions will be relevant for the study:

- Does public expenditure on education promote economic growth?
- To what extent had education in Nigeria contributed to knowledge to the economy?
- What is the relationship between public spending on education and economic growth in Nigeria?
- Have improvement in education affected economic growth in Nigeria?
- Has government spending on educational infrastructural facilities led to the improvement of the standard of education in Nigeria?

## Hypotheses

The following hypotheses are formulated to guide the study:

- I. **H<sub>0</sub>:** There is no significant relationship between public expenditure on education and economic growth.  
**H<sub>1</sub>:** There is a significant relationship between public expenditure On education and economic growth.
- II. **H<sub>0</sub>:** Improvement in educational infrastructure has led to economic Growth in Nigeria.  
**H<sub>1</sub>:** Improvement in education can affect economic growth in Nigeria.
- III. **H<sub>0</sub>:** There is no significant impact on public expenditure in education and economic growth at different regimes in Nigeria between 1970 – 2012.  
**H<sub>1</sub>:** There is a significant impact on public expenditure in education and economic growth at different regimes in Nigeria between 1970 – 2012.

## Significance of the study

The study will provide partial and approximately information on public expenditure on Nigeria. For the future, there is a need to put in place mechanism to regularize the comprehensive collection, aggregation and analysis of these expenditures. The findings of the study will be sufficient to power a wider debate on how funds are provided for the educational system in general and for basic education in particular.

## EMPIRICAL REVIEW AND THEORETICAL LITERATURE

### Conceptualization of public expenditure

CBN (2002) view public expenditure as an outflow of resources from government to other sector of the economy, whether required or unrequired. Public expenditure is categorized into capital expenditure and recurrent expenditure. Capital expenditure has been defined as payment for non-financial assets used in the production for more than one year, while recurrent expenditures are payments for non-repayable transactions within a year, (CBN, 2003).

Public expenditure is a more effective way of producing services. It has a crucial role in investment on infrastructure. A recent study on health and education spending in OECD countries found that public expenditures affects GDP growth more than private expenditure.

Lindauer and Valenichik (1992) stated that government expenditure is influenced by rapid population growth, demographic transitions, taste of the people in a country, increase in technological requirements for industrialization, increase in urbanization, increase in

inflation over time, balance in productivity growth between public and private sector, and the need to address natural disaster.

### Theoretical literature

The following theories of public spending will be used in the study:

- Wagner's Law of increasing Public Expenditure.
- Wiseman and Peacock Hypothesis.
- The Medium Voter Hypothesis.
- Musgrave and Rostow Theory of Public Expenditure.
- Ernest Engel's Theory of Public Expenditure.
- Pure Theory of public Expenditure.

**Wagner's law of increasing public expenditure:** This theory was first associated to a German economist who based his law of increasing state activities on historical facts. The law states that there are inherent tendencies for the activities of different layers of governments to increase both intensively and extensively. It assumes the existence of an economy and the growth of the government activities in which the government sector grows faster than the economy.

**Wiseman and Peacock Hypothesis:** This theory deals with the growth of public expenditure. It was put forth by Wiseman and Peacock in their study of public expenditure in UK for the period 1890-1955. It emphasizes the recurrence of abnormal structures which cause sizable dumps in public expenditure and revenue. Public expenditure should not be expected to increase in a smooth and continuous manner, but in jerks or a stop-like fashion to accommodate special needs, such as natural disaster, war epidemics etc.

**The Medium Voter Hypothesis:** The Median Voter hypothesis states that (under some conditions) government officials choose the level of government spending selected by the median voter according to (Bowen, 1943) and (Black, 1958). However, the outcome of such a choice is a demand for public services, by the median voter that depends upon such things as the median voter's income and such tax price where this price depends in turn in the voter's tax share and the relative unit cost of the public good as given by the technology of public provision.

### Musgrave and rostow theory of public expenditure

Musgrave and Rostow put forward a development model under the causes for growth in public expenditure. They argued that public expenditure is a prerequisite of economic growth. The public sector initially provides economic infrastructure such as roads, railways, water supply and sanitation. As economic growth takes place,

the balance of public investment shift towards human capital development through increased spending on education, health and welfare services (Taiwo, 2011). They assumed that the state grows like an organism making decision on behalf of the citizens. Society demand for infrastructure facilities such as education, health, electricity, transport etc., grows faster than per capita income.

### **Ernest Engel's theory of public expenditure**

Ernest Engel is a German economist who wrote almost the same time as Adolph Wagner in the 19<sup>th</sup> century. Engel pointed out over a century ago that the composition of the consumer budget changes as family income increases. According to Engel, a smaller share comes to be spent on certain goods such as work clothing and larger share on others, such as for coats, expensive jewelries etc (Taiwo, 2011).

### **Pure Theory of public Expenditure**

The pure theory of public expenditure was first expounded in a consistent form in the 1950s by Samuelson, a United State economist. The pure theory of public expenditure fully preserves the category of government services but emphasizes the specific forms of the consumption of these services (Samuelson, 1955). In addition, he virtually denied a role for political economy by concluding that any further exploration of the problem raised by public expenditure would take us into the mathematical domain of sociology or welfare politics, and that it may turn out to be pure luck that within this domain there happened to be sub-sector political economy with the simple properties of traditional economic (Samuelson, 1954). According to Samuelson (1995), public expenditure will grow in sympathy to achieve growth in labor (L) and this will involve increase in education expenses, growth in capital (K) all these will come with through savings or borrowings and technological innovation (Tn), therefore  $Q=F(K,L,Tn)$ . To occur at the earlier stages of national development, there is need for overhead capital such as roads, harbors, power installation, pipe-born water education etc., but as the economy developed, one would expect public share in capital formation to decline over time. However, individual expenditure pattern is thus compared to nation expenditure.

### **Public expenditure on education and economic growth**

The concept of education has been defined as a life-long process through which man's all round (moral, emotional,

physical and intellectual) development is facilitated so that he can be useful to himself and the society into which he is born (Ijaiya & Ijaiya, 2004).

According to Adeyinka and Adetoro (1992), education entails training and acquisition of special skills, knowledge, attitudes and values needed by an individual to be responsible and also gives him room to contribute his own quota to the growth of the society of which he is a member (Ijaiya & Lawal, 2004).

Becker (1964) argued that a man would definitely invest in education as it will give him a promising return in the future. Sen (1999) supported this finding and proved that education as private good benefits directly those who receive it, which in turn affects the individuals' future income stream. However, Denison (1962) is of the opinion that education is a social and economic investment; it chanches the stock of human capital.

Government expenditures on education raise the productivity of labor and determine productivity. For example, workers with greater problem-solving and communications abilities would perform better than their less skilled counterparts at any task that requires more than the routine application of physical labor and will also learn faster and adapt better to changing circumstances. Hence, a more educated labour force will be able to achieve faster productivity growth both through the development of more advanced technologies than a less educated work force. As Alibi et. al., puts it:

The centrality of education in poverty- Reduction policies stems from the belief that education is a powerful equalizer. Education seems to improve the income distribution and thus may allow the poor to benefit from growth to a great extent. Accordingly, a focus of economic policies. On education in order to reduce poverty and speed up development appears to justified (2008: 10).

The impact of education on distribution in social equity is also well acknowledged. For instance, the achievement of Eastern Asian countries was largely due to successful educational strategies (World Bank, 1993).

The provision of education is a key element of a policy to promote broad-based economic growth. Education is considered a major remedy for many problems faced by developing countries. For example, high fertility rates are adding to population pressures in several countries. It is widely accepted that female education helps to lower fertility rates. Moreover, educated parents are in a better position to look after the educational needs of their children.

A number of millennium development goals (MDGs) are directly related to education. These are:

- To achieve universal primary education
- To reduce child mortality
- Improve maternal health
- Combat HIV/AIDS malaria and other diseases.

The overarching goal is the eradication of extreme poverty, for which the development of human resources through education is key. Therefore, by endorsing the goals of MDGs, countries essentially recognize education as priority area for action.

### **The Origin and Structure of the Nigerian Educational System**

Education had evolved in Nigeria prior to the amalgamation of the Northern and Southern protectorate in 1914 (Sambo, 2005). The most active period of the development of education in Nigeria began from 1950, while the constituent parts of the Northern, Eastern and Western regions became self governing. Following the division of Nigeria into Northern, Eastern and Western region when Richards Constitution came to effect in 1947, Nigerian's became the sole policy makers for the educational system.

The three geo-political regions had ministry of education under the leadership of ministers of education who were mainly responsible for educational policies in each region. Director of Education in each region handled the implementation of policies, while at the national level the Director General of education was coordinated by the regional education system.

In 1955, the Joint Consultative Committee on education (JCC) was established as a major organization directly involved with educational activities in the country. Between 1950 and 1975 Western education came to limelight. This period brought the efforts of the regional governments and voluntary agencies (Ajetomobi, 2006). The two main reasons adduced to the increases were the government continued grant-in-aids to voluntary agencies and direct establishment of government and local government schools, community post primary schools, and private post primary schools. At the above formative years, one major problem of education was tailored towards the developmental needs of the century. This instance led to the Ashby Commission's recommendation that technical streams should be created in many Nigerian post primary institutions from where the students could acquire technical skills up to the level of city and guilds certificate of London. Furthermore, commercial education should be left to the university institution.

Universities of Nigeria, Nsukka, Ile-Ife, Ahamdu Bello University, Universities of Zaria and Benin were established between 1960 and 1970 to solve the problem of lack sufficient opportunities for higher education for qualified Nigerians. By the end of 1972/73 academic year, the student population had doubled the Ashby Commissions projection for 1980. According to Ajetomobi (2008), the structure of Nigerian educational system was 6 years of primary school, 5-7 years of post-primary schools (secondary, Teachers Training College and sixth form) and 4-6 years of tertiary education (college of

education, polytechnics, college of technology, and university education). From 1985, the structure that emanated can be classified thus, pre-primary or kindergarten education (2-3 years) for children of aged 3-5 years, the primary school which is of 6 years period for children of ages 6-11 years duration but divided into two halves (3 years of junior secondary school and 3 years of senior school) and the 4-6 years of tertiary education level.

### **Trend of Government Expenditure on Education**

Generally, public expenditure is classified into two categories, namely, recurrent and capital expenditures and these are expenses on consumption and investment. Recurrent expenditures are consumption items; on salaries and wages, while capital expenditures include expenses that contribute to long-term development; social and economic infrastructures.

Government revenue comprises of oil and non-oil components. Table 1 shows that Nigeria generated over 23 trillion naira from oil between 1970 and 2009, which is about 83 percent of total government revenue. However, government spends less than 3 percent of its total collected revenue in education.

A cursory look at the profile of the government expenditure shows that greater percentage of government expenditure was spent on recurrent expenditure between 1970- 2009. Within this period, the total capital expenditure constitutes 40.0 percent of total government expenditure, while the total recurrent expenditure is about 145.00 percent. Between 1987-2008 was remarkable in Nigeria's socio-economic development. It witnessed the introduction of World Bank Structural Adjustment program (SAP). Adoption of National Policy on Education (NPE), the launching of the universal Basic Education (UBE) nationalization of several privately owned companies and the execution of the second and third National development Plans. In fact, between 198 - 2009 there has been a consistent increase in GDP, total federal government collected revenue from education has been fluctuating between 3.80 and 8.13 percent. This is as a result of political instability and inconsistency in continuation of government policies and programs in the country.

### **Strategies and Policies aimed at reforming Education in Nigeria**

The agitation for self-rule by Nigerians in 1954 led the British colonial rulers to change the educational system from 8-6-2-3 system (8 year primary, 6 year secondary, 2 year higher school certificate and 3 year university) to a new system 6-5-2-3 (6 year primary, 5 year secondary, 2 year higher school certificate and 3 year university). The

**Table 1.** Result for model 1:  $RGDP = 25837.6 + 4.8683PE + 540.4365AER$ 

RGDP	Coefficient	T	p>(t)
PE	4.8683	3.56	0.001
AER	540.4365	0.45	0.665
Constant	25837.6	0.54	0.591

F (2, 37) = 9.33 R<sup>2</sup> = 0.3352 F<sub>0.05</sub> = 3.23; Software: STATA 10.0

change was to reduce the number of years in the primary and secondary school levels.

In September, 1969, a National Curriculum Conference was held in Lagos. Participants at the conference were eager to see Nigeria chart a new course in its educational system. They claimed that the inherited colonial system lacked vitality and relevance that was needed for Nigeria to compete globally. The conference recommended changes in the system. From 6 -5 - 2 - 3 system to 6-3 - 3 - 4 system. The recommended new system is simply American system of education which Japan ably copied after 1945.

Bello (2008) posits that "The product the participants produced at the end of the conference was beautiful especially to a country that is hungry for development and show interest in it, they interpreted it differently. They failed to realize that the document is a proposal produced by academics and interest groups. To put proposal into practices needs a careful planning. This was not done, the far reaching proposal was implement with a military dispatch which later backfired. The intended result of this beautiful proposal was muddled up and so was never achieved."

The expansion of education in Nigeria has been on the increase because education has received great attention right from the time of the missionaries through the colonial government to the present day. As a result, the expansion has led to the introduction of the Universal Primary Education, (UBE), National Policy on Education (NPE), and National Universities Commission (NUC) among others in Nigeria.

### National Policy on Education (NPE)

The NPE program established 6-3-3-4 system of education and outlined a national curriculum for schools. The orientation of the policy is geared towards self-realization, individual and national efficiency, national unity etc. In 1985 the objectives of the policy went broadened to include free primary education among others.

### Universal Basic Education (UBE)

UBE was launched in 1999 in the inception of the Obasanjo led administration in 1999. The specific targets

of the scheme are total eradication of illiteracy by the year 2010 and increase in adult literacy rate from 57 percent to 70 percent by 2003 (FRN, 2000).

According to UBEC (2012), the progress of UBE was hampered by lack of an enabling law to execute certain aspects of the program prior to the signing of the UBE bill into law in 2004. The UBE Act 2004 makes provision for the financing of this program the responsibility of states and local governments.

### National University Commission (NUC)

The NUC was established in 1962 as an advisory agency in the cabinet office. In 1974, NUC became a statutory body. The NUC is a parastatal under the Federal Ministry of Education (FME). The commission is saddled with the responsibility of management of university education in the country. The main functions of the commission are:

- Granting approval for all academic programs run in Nigeria universities.
- Granting approval for the establishment of all higher educational institutions offering degree programs in Nigerian universities.
- Ensure quality assurance of all academic programs offered in Nigerian universities.
- Channel for all external support to Nigerian universities.

One significant achievement of NUC is in the area of quality assurance. Quality assurance in Nigerian Higher Education is subject to internal and external mechanism which involves accreditation. This is fundamental for setting of standards at all levels. The University system Act No. 16 of 1985 empowers the NUC to lay down minimum academic standards for all academic programs taught in the Nigerian universities and accredit them.

### Empirical Review

Diamond (1989), Folster and Henreksun (1990), Romer (1990), Baro (1991), Mingat and Tan (1992) Easterly and Rabelo (1993) and Schaddy (2002) among others have attempted to investigate the relationship between public expenditure on education outcomes such as enrolment rates and other outcome indicators. Most of these studies are based on cross-country data.

However, these intensive studies produce conflicting results. For example, Gupta et al., (1999) in their study on 50 developing and transitional economies, using ordinary least squares regression finds that greater public spending on primary and secondary education has a positive impact on widely used measures of education and persistence through grade. Their regression estimates showed that performance in education sector is also affected by other factors such as access to safe water and sanitation, per capita income, adult illiteracy, urbanization, and immunization.

McMahan (1999) finds a negative and significant relationship between per pupil expenditure and the primary gross enrolment rate, and a positive and significant impact of total education expenditure as a proportion of GNP. The findings from the study of McMahan revealed that increase primary education expenditure has a positive and significant impact on the gross enrolment rate. However, this study does not include per capita income as an explanatory variable, and probably the resource variable might have been used as proxy for per capita income. Similarly, Colclough and Lewin (1993) in their study, they included per capita income variable and find that expenditure as a proportion of GNP is not significant when entered separately.

Baldacci et al., (2003) and Gupta et al., (2002) finds that public spending is an important determinant of education outcomes. Their studies reveal that the effect of social spending in education outcomes is stronger in cross-section samples than when the time dimension is also added. They also find that education spending has a greater effect social spending on social indicators is also supported by Psacharopoulos (1994), Bideni and Ravallion (1997), Lopes (2002), and Psacharopoulos and Patrinos (2002).

Kaur and Misra (2003) in their study of 15 non-special category states in India, at the state level. Their empirical findings reveal that public expenditure on education has been more productive as compared to health, and this relationship is stronger for relatively poorer states. Noss (1991) and Tan (1998), finds insignificant or very weak linkages between public education outlays and education indicators. Anand and Ravallion's (1993) empirical result indicated that there was no significant relationship between education outcomes and public spending on education.

Al-Samarrai (2003), in a cross-country test study used Botswana, Malawi and Uganda as a case study, confirm that the link between public spending and primary school access is weak. Furthermore, public expenditure declined, at the same time access was increasing. The negative relationship between access and spending in Malawi and Uganda is partly due to the fact that education service offered changed greatly over that period. Therefore, measure access to the same type of schools and intensity of use cannot be achieved through reductions in per pupil spending. This contrasts the

results of Deolaliker (1997) who used household data for Kenya and finds positive and significant relationship between school spending and primary school enrolment.

Anyanwu and Erhijakpor (2007) used a panel data for African countries from 1990 to 2002 to investigate the relationship between government expenditure on education and enrolment at the primary and secondary school levels with illustrations from the SANE countries (South Africa, Algeria, Nigeria and Egypt) find out that government expenditure on education has a positive impact on education attainment. Ogbu and Gallagher (1991) in a study of five African countries, attempt to establish whether education outcome are affected by the composition of public education spending. The results indicated that enrolment rates are significantly affected by the composition of public education spending.

Afzal et al. (2010) acknowledged that education has positive long-run and short-run relationships on economic growth in Pakistan. This is in line with findings from Lin (2003), and Tamang (2011) in their studies in Taiwan and India respectively. However, Baldacei et al., (2004) documentation on 120 developing countries from 1975-2000 find that there are positive relationships in the long-run between educational expenses and economic growth.

Deverajan et al. (1996) conducted an empirical study in 43 developing countries. Find that excessive government expenditure in education negatively correlated with the country's economic growth. Blang (1970) and Shechen (1971) studies support this argument. They are of the view that investment in education is just merely knowledge or skills are for the individual interest only and do not contribute into the economic growth. Blis and Klenow (2000) in their school achievement significantly contributed to economic growth.

Blejer and Khen (1984), using a cross country data set, find that public investment in infrastructure complements private investment. World Bank (2002) finds that the multiple linkages of infrastructure, economic growth are positively or negatively impacted by the character and state of a country's infrastructure.

Yoshida (2000) presented a positive analysis from various angles of the correlations between economic growth and the infrastructure in Japan, such as the education, energy and transportation sectors over the last country in order to derive lessons that can be useful to developing countries. He finds that the growth rate of demand in infrastructure was much higher than that of per capita GNP in the early stage of development.

Canning (1998) provides a data set on physical infrastructure stock such as roads, telephones, school buildings. The result indicated that physical infrastructure promoted economic growth positively.

## RESEARCH METHODOLOGY

Building on the existing theoretical and empirical literature, this study perceives a causal relationship

between public expenditure on education and economic growth in Nigeria. Therefore, exploratory causal study is adopted to investigate the impact of public expenditure in education on economic growth within the context of Nigerian economy. Econometric approach is adopted in analyzing data considered relevant components of public spending on education and economic growth.

Estimation of the model consists of the ordinary least square (OLS) estimation technique, Vector Auto regression (VAR) model and stationarity test (ADF). A dummy variable will be introduced to test the expenditure variability between the military and civilian regimes, which regime allocated more funds to the educational sector during this period under study.

### Sources of data

The study solely depends on secondary sources of data, which utilizes time series data (1970 – 2009). The data were sourced from the Central Bank of Nigeria (Statistical Bulletin and Annual Report and Statement of Accounts), National Population Commission, National Bureau of Statistics, The World Bank Publication, Journals, text books and magazines.

### Model Specification

In line with our stated objectives, we specified the following models to address the various objectives.

The economic growth, public expenditure on education functional relationship is expressed in real term as follow:

$$RGDP = f(PE_{ed})$$

The econometric form of the model can be expressed as:

$$RGDP = \alpha + \beta AER + \beta PE_{ed} + \mu \quad (1)$$

Where: RGDP = Real gross domestic product; AER = Adult Enrolment Ratio;  $PE_{ed}$  = Public Expenditure on Education;  $\beta_i$  = Coefficients of variables or parameter to estimate in the regression;  $\alpha$  = Intercept;  $\mu$  = Error term which is iid.

Equation 2 addresses objectives one and two; the impact of education and educational public expenditure on economic growth in Nigeria. Thus, it is required that variables in a model should be integrated of the same order to meet the condition for long-run equilibrium relationship known as cointegration. If this condition is not met, a better option for estimation as suggested by Gujarati and Porter (2009) and Greene (2003) is the Vector Autoregression (VAR). Based on this premise, the unit root test (ADF-test) will be carried out, and the Vector Error Correction Model (VECM) will also be apply to equation 2 for proper analysis on the impact of public

expenditure in educational infrastructure on Economic growth in Nigeria.

Checking the variation of the expenditure level between the two administration (military and civilian) we then introduce a dummy variable to the equation 2 which result to

$$RGDP = \alpha + \beta PE_{ed} + \rho mil + \mu \dots \dots \dots (2)$$

Wherein the intercept represent civilian rule and  $\rho$  assume a value of one if military regime and zero otherwise. The introduction of one single dummy variable (mil) is to avoid multi co linearity. Other variables remain the same as earlier defined.

### Method of analysis

The analysis of this study employ a three approach analysis method which include the economic; whether the establish theory agrees with our parameter estimation. Statistical; if the assume variable are significant at 5 percent level using the t-test and the f-ratio test, and finally econometric; if the selected data are stationary and no autocorrelation, hence, no violation of OLS assumption.

## PRESENTATION AND ANALYSIS OF DATA AND RESULT

**Data presentation and analysis:** We use in this study time series data covering the period from 1970 to 2012. The data were sourced from CBN statistical bulletin 2010 and NBS publication, the choice of this institution seems to be reliable in producing data of this nature.

**Results' presentation:** The results are presented in a tabular form

### Discussion of results

In this section we discuss the result as follows; from model one the result shows that at zero level of public expenditure in education and adult education ratio economic growth is at twenty-five thousand eight hundred and thirty-seven point six (25837.6). This is the intercept of the regression, known as the autonomous GDP (GDP at zero factor inducement). The regression line is assumed to represent the exact relationship between the variables under consideration. From the estimate our result agreed with our aprior expectation, giving the positive coefficient attached to  $PE_{ed}$  and AER. At a unit change in  $PE_{ed}$  real economic growth will increase by 4.8683. On the other hand AER influence RGDP by 540.4365 at a unit change. Statistically the probability

**Table 2.** Result for model 2:  $RGDP = 22932.02 + 5.4704PE + 22927.89MIL$ 

RGDP	Coefficient	T	p>(t)
PE	5.4704	3.53	0.001
Mil	22927.89	0.35	0.754
Constant	22932.02	0.34	0.736

F (2, 37) = 9.25 R<sup>2</sup> = 0.3333; Software: STATA 10.0

value reveals that AER is not a significant factor to predict economic growth in Nigeria. Based on the premise that if p-value is greater than 0.05 (0.665), where p is a good determinant of economic growth at 5% level of significant with a p-value of 0.001, hence we can conclude that public expenditure in education has a significant impact on economic growth in Nigeria. The f-ratio (9.33) against 3.23 also reveals that the overall regression line is significantly different from zero. However the coefficient of determination R<sup>2</sup> (0.3352) implies that the selected variables has a weak influence on economic growth, it also show an existence of autocorrelation. One can always conclude that the data used has a unit root which call for further analysis.

Model 2:  $RGDP = 22932.02 + 5.4704PE + 22927.89MIL$  (see Table 2), from this estimate we observed that given civilian administration expenditure in education as the intercept (22932.02) twenty-two thousand nine hundred and thirty-two point zero two, military administration spent about twenty-two thousand nine hundred and twenty-seven point eight nine more than the civilian administration in Nigeria. In the same vane public expenditure which influences economic growth with 5.4704 is the only variable that is significant with a p-value of (0.001). The regression line statistically different from zero with f-ratio of (u9.25) and again the variables prediction of the dependent variable variation are still weak with R<sup>2</sup> of 0.3333. The hypothesis here is that we also reject the null hypothesis on the conclusion that public expenditure has a significant impact on economic growth. Secondly that administrative expenditure on education is different between regimes but not significant. This might be as a result of figure inflation, corruption, misallocation of resources in the public sector.

## CONCLUSION AND RECOMMENDATIONS

We presented and analyzed our regression result estimate. These analyses guild us in this to make inferences as regards to, recommendations for policy implication and further studies, and draw viable conclusion on the issue of public expenditure in education and economic growth in Nigeria.

**Conclusion:** This study aims to establish the impact of public expenditure on infrastructural facilities and

economic growth in Nigeria, a case of the educational sector. The investigation indicates that poor financial resources to the educational sector have been a major problem in the Nigeria educational system. Due to poor financing the quality of education offered has resulted to poor attendance, poor quality students, inadequate preparation by teachers at all levels and morale of teachers as a result of low basic condition of services and low salaries.

The result from the study reveals that public expenditure in education has a significant impact on economic growth in Nigeria.

**Recommendations:** It is imperative that educational development in skills, knowledge and desired work attitude has helped greatly in the development of many organization and countries.

Infrastructure development plays a major role in promoting growth and equity, and through both channels, help to reduce poor quality of students.

Based on findings from the empirical analysis, the study proffers the following recommendations, among others:

- A conducive working environment should be provided for both academic staff and their non academic counterpart couple with payment of sustainable wages.
- Finally, government should improve the existing educational facilities by either revamping them or also introducing new ones, so as to boost educational system.

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