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Disaggregated Government Spending on Infrastructure and Poverty Reduction in Nigeria

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Disaggregated Government Spending on Infrastructure and Poverty Reduction in Nigeria

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1. INTRODUCTION

One of the major functions of a responsive government is to provide social/public goods like transportation, power supply, telecommunication, health, education, defense and so on for its citizens. Most of these responsibilities are carried out through spending/expenditures. Government expenditure is an important fiscal instrument recognized as an agent of growth in every economy. Infrastructure is the physical structure needed for the operation of a society. Infrastructure is synonymous to economic development: Roads, railways, and utility systems are needed in every economy, and the lack of infrastructure services signal barriers to growth and underdevelopment (Jones, 2006). Infrastructural development involves fundamental structures that are required for the functioning of a community and society and it has made a net contribution of around one percentage point to Nigeria's improved per capita growth performance recently likewise, Nigeria already spends \$5.9 billion per year on federal infrastructure, equivalent to about 5 percent of

GDP. Existing spending patterns are heavily skewed toward capital investment, with little provision for operations and maintenance and heavily dominated by power sector. Mostly, Information on the infrastructure spending of sub-national governments was not available, and so could not be assessed (Vivien & Nataliya, 2011). Poverty is one of the prominent issues in Nigeria owing to; rapid population growth, lack of good governance because of corruption, poor infrastructure, lack of food production capacity due to little or no concentration on agricultural sector, poor health facilities to mention a few.

Nigeria has a remarkable economic growth for the past decade but it has not reflected in combating the problem of poverty which happens to be the number one of Millennium Development Goals (MDGs). Various efforts have been made since 1972 to eradicate/reduce poverty in Nigeria such as: National Accelerated Food Production Programme and the Nigerian Agricultural and Co-operative Bank of 1972, Operation Feed the Nation (OFN) of 1976 targeted at teaching the rural farmers how to use modern farm implements, Green Revolution Programme of 1979 aimed at reducing food importation and increasing food production, Directorate of Food, Roads and Rural Infrastructure (DFRRI) of 1986, Family support programme as well as Family Economic Advancement Programme of 1993 so also National Poverty Eradication Programme (NAPEP) of 2001. Despite these programmes 63% of Nigerians still leave in poverty. Capital expenditure is on the increase yet poverty rate is on the increase. In the 26 – page report released by National Bureau of Statistics, the detail of poverty and income distribution across the country was given explicitly and out of the major findings and categorization from the survey we have the following:

The measurement of Relative poverty which is defined by reference to the standard of living of majority in a given society for Nigeria was 54.4% in 2004, but increased to 69% in 2010. The North-West and North – East geo-political zones in Nigeria recorded the highest poverty rates of 77.7% and 76.3% respectively in 2010. Sokoto state has the highest poverty rate among Nigerian states of 86.4% while Niger state has the lowest of 43.6%. The absolute poverty rate (defined in terms of the minimal requirement necessary to afford minimal standards of food, clothing, healthcare and shelter) in Nigeria was 54.7% but increased to 60.9% in 2010.

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Using the Dollar –per-day shows that 51.6% of Nigerians were living below US\$1 per day in 2004, but this increased to 61.2% in 2010. Using subjective method, 75.5% of Nigerians considered themselves to be poor in 2004 and in 2010, the number went up to 93.9%. Using various economic models, for completeness and to guide policy, NBS estimates that poverty level may rise slightly from 2011. The survey suggests rising income inequality in Nigeria using Gini – coefficient.

Globally, Nigeria ranks low in the quality of its infrastructure which impacts the ease of doing business. Low investments in transportation have resulted in the current infrastructural deficit. Key challenges include inadequate investment and poor management of transport infrastructure – which have created a huge infrastructural deficit (Igwe, C.N., Oyelola, O.T., Ajiboshin I.O., Raheem S., 2013).

Most poor people of the world reside in rural areas, which are frequently characterized by low levels of public infrastructure, especially roads. Inadequate roads raise transport costs, limiting the use poor people can make of local markets for the sale of their produce, the purchase of consumer goods and opportunities for off-farm employment. Access to educational and health facilities, where they exist, is also constrained when it is difficult to reach them (Peter, 2005).

From the above, it has been widely researched that economic infrastructure is critical for economic growth and poverty reduction, giving its pivotal role in improving competitiveness; facilitating both domestic and international trade, and integration of continent to the global economy. Government spending is on the increase as well as poverty in Nigeria. Hence, the need to establish, the association between them, as well as the possible effects of governments spending on infrastructure through Building and construction, transport, education and health on poverty in Nigeria.

In order to establish this relationship, this paper is divided into five major parts; the first section deals with introduction of the study, followed by literature review, methodology, analysis and finally, discussion of findings.

II. LITERATURE REVIEW

A lot of works have been done on government expenditure and economic growth in Nigeria, some of the recent ones are: Abu & Abdullahi, (2010); Ogun T.P. (2010); Oluwatobi & Ogunrinola, (2011); Edame, (2014); Ogundipe & Oluwatobi (nd); Chude & Chude, (2013); Taiwo & Agbatogun, (2011); Adewara & Oloni, (2012); Akpokerere & Ighoroje (2013); Robinson, Erawoke & Ukavwe, (2014); Oyinola & Akinnibosun, (2013); Amassoma, Nwosa & Ajisafe (2011); Aruwa, (2010); Usman, Mobolaji, Kilishi, Yaru & Yakubu (2011); Habib & Stephen (1999) and a host of others. While a few out of which we have: Akinlabi, Jegede & Kehinde (2011);

Vivien et.al (2011) also, Okonjo-Iweala and Osafo-Kwaako (2007); Ogun (2010), Igwe et.al (2013) have examined government expenditure on infrastructure and poverty reduction. Shenggen, Peter & Sukhadeo (1998) equally examined government spending, growth and poverty in rural India. Researchers like Fasoranti (2012); Nworji and Oluwalaiye (2012); have examined the link between government expenditure on infrastructure and economic growth in Nigeria. There are three views regarding investment in infrastructure and poverty reduction: the first one argues that investment in social infrastructure, which includes investment in education and health, is more relevant to the goal of poverty reduction rather than physical infrastructure (Jahan & Mccleery, 2005). Ogun (2010) also submit that investment in social infrastructure has greater potential to reduce poverty than investment in physical infrastructure in Nigeria. The second view holds that both physical and social infrastructure can reduce poverty by linking poverty reduction to growth of an economy. While the third view holds that investment in infrastructure has no effect on poverty reduction. Ali and pernia (2003) used road, electricity and irrigation to measure physical infrastructure focusing on rural poverty and discovered that road transport has a more significant effect on poverty reduction than electricity because the cost of acquisition and maintenance of it comes from households. Therefore, the poor may not be able to afford it. However, they observed that weak governance and institutions permit corruption, distorted public investment choices, and neglected maintenance, which in turn lowering infrastructures contribution to economic growth and diverting benefits intended for the poor. Generally, there is now wider recognition that if governance and institutional frameworks are strengthened, the linkage between infrastructure and reduction of poverty can become stronger.

The study of Kwon (2005) on infrastructure, growth and poverty reduction in Indonesia shows that road investment improves the performance of provincial economic growth in poverty reduction. Government investments that were considered were irrigation, roads, health, science and technology, agriculture and forestry, and education. They include macroeconomic variables such as; regional production, agricultural employment, non-agricultural employment, agricultural production, and real wages. Peter (2005), in his study on road development and rural poverty in Lao shows that all-weather road has a positive and highly significant effect on poverty. During the period under consideration, Lao experienced about 13% decline in poverty incidence as a result of road development.

a) Empirical Review

Abu and Abdullahi (2010) used a disaggregated analysis of government expenditure having total capital expenditure, total recurrent expenditure, government

expenditure on education, government expenditure on transport and communication and government expenditure on health as measure of expenditure. They found that total capital expenditure, total recurrent expenditure and government expenditure on education have negative effect on economic growth. In the same vein, Mauro (1998) in his examination of composition of government expenditure discovered that corruption lowers expenditure on education and perhaps on health. Igwe et.al (2013) identified poor maintenance city planning as problems facing road infrastructure in Nigeria. In the work of Amassoma et.al (2011), while using error correction modeling to determine the linkage between components of government spending and economic growth in Nigeria, they used components of government expenditure such as; agriculture, education, health, transport and communication and found that expenditure on agriculture had a significant effect on economic growth in Nigeria while expenditure on education, health and transport and communication had insignificant influence on economic growth. They recommended that, there is need for an increase in the budgetary allocation to the agricultural sector and also initiate incentives that can promote the activities of rural farmers in promoting output growth of the sector. The monetary authorities should bridge the widened gap existing between lending rate and deposit rate to enhance agricultural output in Nigeria. The continuous decline in budgetary allocation to the education and health sector should be reverse as this would act as a catalyst to improve performance of the sectors and ultimately impact on the aggregate economy. There is the need for the government to redirect their excessive government revenue in the maintenance of government official both in the house of senate and house to representative to these pivotal sectors of the economy. Such redirection of fund would bring about improve performance of the sectors (Amassoma et.al. 2011).

Akinlabi et al (2011) examined public infrastructure as an approach to poverty alleviation and economic growth in Nigeria. They adopted Vector Autoregressive (VAR) framework. They equally used real per capital expenditure on economic service and real per capital income on social and economic services as proxy to infrastructure they used level of fiscal deficit to proxy quality of governance with the assumption that in any economy where level of infrastructure leads to poverty alleviation, the quality of governance must be a contributing factor. They found out that; public infrastructure granger causes poverty alleviation directly through economic growth, fiscal deficit does not granger cause poverty alleviation and they concluded that, continuous increase in public infrastructure through increase in capital expenditure on economic, social and community service and qualitative governance will alleviate poverty in Nigeria. The introduction of improved infrastructure on both roads and electrification has

contributed to agricultural growth in India and thereby, reduce poverty (Shenggen, et al 1998).

While the capacity to formulate sound public policies for urban development and housing is not lacking, consistent failures of institutions and political structures, corruption and corrupt practices have hindered the successful implementation and actualization of such policies in the country (Onakuse & Leniyan, 2007). Many builders' cut-corners to get their building plans approved, thereby neglecting the safety codes as enshrined in the building plan. Although bribes are not taken by planning officials to grant unlawful development permits, officials do tacitly overlook planning and building contraventions for pecuniary gains. The absence of standardized training for artisans engaged in the construction industry is another fundamental cause of construction defects which culminate in disaster risks. Eighty percent of artisans in the construction industry are not certified and unskilled (Ede, 2011), (Aniekwu & Ozochi, 2010), (Kayode et.al 2008) as cited in Adelekan (2013).

Adewara and Oloni (2012) explored the relationship between the composition of public expenditure and economic growth in Nigeria between 1960 and 2008 using the Vector Autoregressive models (VAR). Their findings shows that expenditure on education has failed to enhance economic growth due to the high rate of rent seeking in the country as well as the growing rate of unemployment. They also found that expenditure on health and agriculture contributed positively to growth.

Fasoranti (2012), examined the effect of government expenditure on infrastructure on the growth of Nigerian economy. She used government expenditures on education, government expenditure on environment and housing, health services, transport and communication, agriculture, security, inflation rate as explanatory variables and gross domestic product as explained variable. Some of the findings include; long run relationship between the growth of the economy and government expenditures in education, environment and housing, health services, water resources, inflation rate, agriculture, security, transport and communication. The paper observed that government expenditures on health services, transport and communication imparted negatively on growth while expenditures in agriculture and security were not significant in the growth of the economy.

III. METHODOLOGY

For this study, Per Capita Income (PCI) was used to proxy welfare which in turn means reduction in poverty, Government Spending on Road Transport (GSRT), Government Spending on Building and Construction (GSBC), Government Expenditure on Education (GEE) and Government Expenditure on Health (GEH) were used as proxy for government

expenditure on infrastructure. The data used are secondary in nature from National Bureau of Statistics annual data and statistical bulletin of central bank of Nigeria. The research design adopted for this study is time series and the scope of this study is from 1970 to 2012 (43 years) both years inclusive. Ordinary Least Square (OLS) estimation method was used with regression analytical method. Some diagnostic tests like unit root test, co-integration test and vector error correction model were employed to ascertain stationarity, order of integration and possibility of long run effect of expenditure on infrastructure on poverty reduction in Nigeria. These tests are necessary to ensure that the regression results are not spurious.

Using Keynesian definition of aggregate output, the functional relationship is as follows;

$$PCI = f(GSRT, GSBC, GEE, GEH) \text{ ----- eqn 1}$$

The multiple linear regression equation is stated in eqn 2 as follows;

$$PCI = \beta_0 + \beta_1 GSRT + \beta_2 GSBC + \beta_3 GEE + \beta_4 GEH + \mu \text{ ----- eqn 2}$$

Taking the natural log of equation 2 we have;

$$LNPCI = \beta_0 + \beta_1 LNGSRT + \beta_2 LNGSBC + \beta_3 LNGEE + \beta_4 LNGEH + E_t \text{ ----- eqn 3}$$

The general error correction model adopted for this study is;

$$\Delta LNPCI_t = \beta_0 + \beta_1 \Delta LNGSRT_t + \beta_2 \Delta LNGSBC_t + \beta_3 \Delta LNGEE_t + \beta_4 \Delta LNGEH_t + ECM_{t-1} + E_t \text{ ----- eqn 4}$$

Where,

PCI = Per Capita Income

GSRT = Government Spending on Road Transport

GSBC = Government Spending on Building and Construction

GEE = Government Expenditure on Education

GEH = Government Expenditure on Health

A priori Expectations

$$\frac{\Delta PCI}{\Delta GSRT} > 0, \quad \frac{\Delta PCI}{\Delta GSBC} > 0, \quad \frac{\Delta PCI}{\Delta GEE} > 0,$$

$$\frac{\Delta PCI}{\Delta GEH} > 0,$$

The above expressions mean that we expect their coefficients to be greater than zero. That is, non-negative. We expect that an increase in expenditure on road transportation should increase the per capita income which should alleviate poverty, an increase in expenses on road will make the road more motor able

and increase the trade within the country, thereby alleviate poverty. Likewise, an increase in expenditure on building and construction should increase per capita income. Also, an increase in expenses on education will bring about an increase in human capital formation which will reduce poverty in line with Maku (2009), when he regressed real GDP on private investment, human capital investment, government investment and consumption spending. An increase in expenditure on health will improve the health of the people by providing first aids, maternity homes, hospitals etc. this will increase the productivity of the people and reduction of poverty.

IV. DATA ANALYSIS

The unit root test showed that all the variables were not stationary at levels but were stationary at first difference as shown below. This test is necessary for econometric model and to make proper inference, also economic theory suggests that certain variables should be integrated (Bo, 2008).

Table 4.1 : Unit root test at level

Variabl es	ADF	Critic al Value (1%)	Probabil ity	Level of Significan ce	Remar k
GEE	6.4383	- 3.6155	1.0000	0.05	Non-stationa ry
GSRT	0.2326	- 3.5966	1.0000	0.05	Non-stationa ry
GSBC	2.9582	- 3.5966	1.0000	0.05	Non-stationa ry
PCI	1.1537	- 2.6211	0.9334	0.05	Non-stationa ry
GEH	3.8227	- 2.6347	0.9999	0.05	Non-stationa ry

Table 4.2 : Unit root test at first difference

Variabl es	ADF	Critic al Value	Probabil ity	Level of significan ce	Remar k
GEE	- 4.8547	- 3.6010	0.0000	0.05	Stationa ry
GSRT	- 7.4376	- 3.6010	0.0003	0.05	Stationa ry
GSBC	- 6.3247	- 2.6226	0.0000	0.05	Stationa ry
PCI	- 7.209	- 6.864	0.0000	0.05	Stationa ry

	7	1			
GEH	-	-	0.0000	0.05	Stationary
	4.5618	5.4247			

Table 4.3 : Johansen Co-integration test result

Hypothesized	Eigen Value	Trace statistic	0.05 critical value	Probability
$r = 0$	0.6696	93.8953	69.8189	0.0002
$r \leq 1$	0.4608	48.4886	47.8561	0.0435

Trace test indicate 2 co-integration equations at 0.05 levels of significance, while max-eigen indicates 1 co – integrating equation at 0.05 levels of significance. These indicate that a long run equilibrium relationship exists between dependent variables (PCI) and independent variables (GEE, GSRT, GSBC, GEH).

Table 4.4 : Static long run equation of poverty reduction

Variables	Coefficient	Std. Error	t-statistic	Probability
C	53440.08	1867.34	28.6184	0.0000
LNGSBC	2.8599	0.8090	3.5352	0.0011
LNGSRT	-1.6249	0.4152	-3.9137	0.0004
LNGEE	0.0938	0.0809	1.1597	0.2534
LNGEH	-0.0997	0.1230	-0.8112	0.4223

$$R^2 = 0.70, DW = 0.51, F\text{-Statistic} = 22.2917 (0.00000)$$

Table 4.4 shows that government spending on building and construction has a positive and significant effect on poverty reduction in Nigeria as expected, while government spending on road transport has a negative and significant effect on poverty reduction in Nigeria contrary to the a priori expectation. Government spending on education has a positive and insignificant effect on poverty reduction in Nigeria so also, the relationship between government expenditure on health and poverty reduction is negative and insignificant. The model is reliable in showing the relationship between government spending on infrastructure and poverty reduction in Nigeria.

Table 4.5 : Results of Vector Error Correction model of poverty reduction in Nigeria

D(PCI) Dependent variable	
Constant	2083.9 (638.003) [3.266]
LN(GSBC)(-1)	-1.7249 (0.8275) [-2.0846]
LN(GSRT(-1)	0.6205 (0.4871) [1.2741]
LN(GEE(-1)	-0.0550 (0.0433) [-1.2700]
LN(GEH(-1)	-0.0789 (0.0731) [-1.0802]
ECM(-1)	-0.5173 (0.0606) [-2.3655]

() denotes standard error

[] denotes t statistics

The above table shows that the coefficient of ECM conforms to the a priori expectation in that the coefficient is negative and lies between 0 and 1. This is also in line with the result of co integration test that there exist a long run relationship between government spending on infrastructure as measured by; building and construction, road transportation, education, health and poverty reduction in Nigeria but the relationship is insignificant.

V. DISCUSSION OF FINDINGS AND POLICY IMPLICATION

This study examined the long run relationship between government expenditure on infrastructure and poverty reduction in Nigeria. Time series data of 43 years were obtained from CBN statistical bulletin and Augmented Dickey Fuller unit root test showed that all the variables (dependent and independent) are not stationary at level but were stationary at first difference. This is the reason why the natural logarithm of the data was used so that the result will not be spurious. There exists a long run relationship between government spending on infrastructure and poverty reduction in Nigeria this result is in line with the result of Akinlabi et al (2011), Shenggen et al (1998) though, the variables used were different. The regression result showed that government spending on building and construction has a positive and significant effect on PCI (poverty reduction) in Nigeria. The result is expected because an

increase in expenditure on building and construction will increase employment rate and per capita income will increase. The submission of Igwe et al (2013) equally applies to this paper because an improvement on building and construction will alleviate poverty. Unlike the result of Peter (2005) which he carried out in Lau, government spending on transport has a negative and significant impact on poverty reduction in Nigeria. This can be due to corruption level which has rendered almost all the economic theories inapplicable to the nation. The reasons given by Fasoranti (2012) out of which we have; poor management, poor funding, misappropriation of fund, inadequate modern technology and so on may also apply to this situation. Government expenditure on education has a positive but insignificant effect on poverty reduction in Nigeria and government expenditure on health has negative and insignificant effect on poverty reduction in Nigeria. Adewara and Oloni (2012) found that expenditure on education has failed to enhance growth so also, in this study, poverty reduction has failed to respond to government expenditure on education. The result of GEE and GEH also did not comply with a priori expectation. Generally, the model is statistically significant. That is, government spending on infrastructure has a significant impact on poverty reduction in Nigeria and the model is fit to explain poverty situation in the country. About 70% of the variation in per capita income (poverty reduction) can be explained by variation in government expenditure on infrastructure in form of building and construction, transport, education and health. Policies to increase spending on building and construction should be implemented as poverty reduction responds to it positively. Government spending on education should also be increased, since it can alleviate poverty as human capital formation improves the economy. The transportation sector of Nigeria needs monitoring and urgent attention because an increase in spending on transport should alleviate poverty and not otherwise. Policies should then be put in place to ensure achievement of desired result.

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