IMPACT OF TRANSPORTATION INFRASTUCTURE INVESTMENT ON ECONOMIC GROWTH IN NIGERIA

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ABSTRACT

The Nigerian economy has grossly underperformed relative to her enormous resource endowment than her contemporary countries. This problem is of concern to this study because the trend has to be discontinued. This present study therefore, empirically examined the influence of transport infrastructure investment on economic growth in Nigeria from 1981-2011. The data used for the study were sourced from the Central Bank of Nigeria Statistical Bulletin 2010. This research adopts the ex-post facto research design. The simple regression technique was used to analyze the data. The results suggest that transportation infrastructure investment has significant and positive influences on economic growth in Nigeria. The authors concluded that transportation infrastructure investments significantly affect Nigerian economy as a result of its impact on the country's gross domestic product. Policy recommendation include that government must take a more cautious look at transport infrastructure investments as a source of revenue, as they relate with gross domestic product in Nigeria. On the other hand, transport infrastructure investments can be encouraged in an attempt to increase economic growth in Nigeria. The study contributes to the literature that seeks to identify the effects of transportation infrastructure investment on economic growth and proved beyond reasonable doubt that the results of the study are comparable with the research findings in similar studies worldwide.

Key Words: Economic Growth, Gross Domestic Product, Nigeria, Transportation Infrastructure Investment.

INTRODUCTION

It is essentially common that governments in both developed and developing countries spend heavily on transport infrastructure as a means to enhance economic development. Fascinatingly, regardless of the aforesaid policy emphasis, there exists no concrete agreement on the impact of transport infrastructure on economic growth at the

whole level (Pereira & Andraz, 2012). Several scholarly inquiries insinuate that government expenditures on public infrastructure, including transportation, can ameliorate productivity or scale down cost of production and, accordingly, accelerate economic growth (Fernald 1999; Glass 2008; Pereira & Andraz, 2012).

Gramlich (1994) opines that it stays basically fathomless whether the course or path of causation is from transport infrastructure to economic growth or conversely on the one as well as the other. Kessides (1996) observes that a cardinal demerit of inquisition on the economic influence of transportation infrastructure is that it has awfully not sufficiently reckoned for coexisting impacts on which economic growth can trigger development of the transport system in addition to its outcome. Interestingly, transportation infrastructure investment triggers economic growth through its expansion of the stock of capital required for production of goods and services. Transportation projects can impact positively on distinct goals of government, because of the nexus between economic objectives and the aggregate volume of economic activity. With adequate capital and efficacious production level, real income levels and standard of living can ameliorate.

Several previous inquisitions on transportation and economic growth has accumulated (Babatunde, 2018; Siyan, Eremonkhale & Makwe, 2015; Pradhan & Bagchi, 2013; Nogzi & Mulikat, 2010; Ogun, 2010 Canny & Bennathan, 2000). However, these studies could not confirm the direction of causation of transportation infrastructure investment of economic development. Besides, evidence from relevant literature revealed that few empirical studies have investigated the economic contribution of transportation infrastructure investment on economic development. This research interest is therefore informed by recognizing the unique nature of transportation as engine for economic growth that is associated with positive impacts in terms of aggregation of volume of economic activity, enhancing growth in gross domestic product (GDP). Therefore, our point of departure is to fill this gap by institutionalizing the economic contribution of transportation infrastructure investments on economic growth in terms of total contribution to real GDP. This is the background that motivated this study.

Statement of the Problem

Specifically, sustainable economic growth ought to be attainable, but, ironically, this is not the case. The problem is that the economic growth recorded has not translated into improved welfare of the citizenry as anticipated in some countries (Babatunde, 2015; Mitchell, 2005). The Nigerian economy has grossly underperformed relative to her enormous resource endowment and her contemporary countries. This problem is of concern to this study because the trend has to be discontinued.

Given the fact that transportation infrastructure investment is very crucial to the growth of the economy, the situation of transportation infrastructure in Nigeria is at a poor state (Obi, 2011; Adeniji, 2000). Moreover, some scholarly inquiries (Pradhan & Bagchi, 2013; Mandl, Dierx & Ilzkovitz 2008; Canning & Bennathan, 2000) suggest that there should be further improvement in the efficiency and effectiveness of public spending. Nonetheless their studies do not cover developing nations where there is a shortage of such research. This present study fills this knowledge gap and domiciles its study in Nigeria, a developing nation, by directing its emphasis towards meeting the relationship between transport infrastructure investments and economic development in Nigeria. Therefore, the study investigates transportation infrastructure investments and its effects on economic growth in Nigeria from 1981-2011.

Aim and Objectives of the Study

This study aims to provide a scholarly contribution to knowledge in the area of transportation infrastructure investments and economic growth through an empirical and analytical procedure. Therefore, the objective is to:

i. Examine the influence of transportation infrastructure investments on economic growth in Nigeria.

Research Question

(1)To what extent do transportation infrastructure investments affect economic growth in Nigeria?

Research Hypothesis

H01: Transportation infrastructure investments do not significantly influence economic growth in Nigeria.

REVIEW OF RELATED LITERATURE

Theoretical Review

This study is anchored on the public expenditure theory. The applicable public expenditure theory in this study is based on Wagner's law, known as the law of increasing state spending. Wagner's law was formulated by Adolph Wagner (1835–1917), and upholds that for any country, public expenditure constantly moves upwards as income growth amplifies. Magazzino, Giolli, and Mele (2015), explain that Wagner's law demands that in economic development process, public sector share in GDP has been unfolding over time. This study expects that if growth in transportation infrastructure investment matches economic growth, then it should also translated into economic development; however, this has not been the case in reality in developing nations like Nigeria because sometimes there are constituents of financial fantasy in government active behaviour.

Concept of Transportation Infrastructure Investment

Trimbath (2011) remarks that transportation infrastructure investment is one of the most critical ways to advance a country's economic growth and expunge poverty. Transport infrastructures, such as road and rail, are major components that trigger the growth of modern economies, and also, improve the health of citizens (Mandle et al, 2015). It is often considered a prerequisite for economic growth in developing countries (Arima 2016), The furtherance of transport infrastructure can grease the growth of urban centers, agricultural and industrial sectors (Skorobogatova & Kuzmina-Merlino,2017), and international trade (Hopcraft, Bigurube, Lembeli, & Borner, 2015).Road transportation infrastructure including highways and rural roads is vital for movement of goods and services critical to a country's economic vitality, and has been recently categorized by many scholars as the most important engine for economic development (Akhmetzhanoy & Lustoy, 2013; Njoh, 2012). Road transportation infrastructure has been acknowledged by many scholars recently as critical drivers of economic growth, and as the most important or physically powerful facilitators of economic development activities for several industrialized countries (Bagchi & Pradhan, 2013;; Kustepeli et al., 2012; Njoh, 2012; Lakshmanan, 2011). Accurately, moving loads of raw materials to the factory and finished goods to the market in a well timed manner requires accessible transportation infrastructure system, mainly in the form of roads traveled by trucks and automobiles (Adler & Polsky, 2010; Haghshenas & Vaziri, 2012; Tukker & Dietzenbacher, 2013).

Economic Growth

Aigbokhan (1995) conceptualized economic growth as an increase in the average rate of output produce per person exactly measured on a per annum basis. Xue (2010) explains that economic growth is the increase in services produced in a nation over a long time period. It is measured by an increase in gross domestic product (G.D.P.) adjusted for inflation, and a nation is expected to continually improve its G.D.P. for sustainability. Godwin (2007) alludes to economic growth as an increase in real gross domestic product (GDP). Ullah and Rauf (2013) remark that an increase in real GDP of a country will lead to the overall output, called economic growth. Economic growth is therefore, an increase in the fiscal value of goods and services of a country over a given period, as indicated by G.D.P.

Nnamocha (2002) opines that the Gross Domestic Product (GDP) is the total money value of all goods and services produced in the domestic economy by every individual residing in an economy. Abdulrasheed (2005) portrays that GDP is employed as a means of balancing the assets location and to determine the position of the optimal opportunity of investors. Paul (2012) alludes to GDP as the dollar flow of total product for a nation, measureable through the flow-of-cost approach or the income approach. Thus the GDP stands as the most all encompassing measure of the total output or national output of an economy,

EMPIRICAL REVIEW

This section reviewed some body of empirical literature that found that transportation infrastructure investment is largely positively correlated with aggregate economic growth.

Babatunde (2018) examined government spending on infrastructure and growth in Nigeria using both primary and secondary data. The primary data constitute, a sample of 242 respondents selected through a random sampling while, the secondary data comprise of reported annual spending on selected infrastructure and annual Gross Domestic Products for 1980 to 2016 for Nigeria. The descriptive statistics, unit root and co- integration tests using Augmented Dickey–Fuller and Phillip–Perron model, and the weighted least square were carried out on the data. The findings reveal that government spending on transport and communication, education and health infrastructure has significant effects on economic growth; spending on agriculture and natural resources infrastructure recorded a significant inverse effect on economic growth in Nigeria.

Siyan, Eremionkhale and Makwe (2015) investigated the impact of road transportation on economic growth in Nigeria using both primary and secondary data. Probit model was used to analyze the primary data while multivariate model was used for analyzing the secondary data to determine the long run relationship between growth and road transportation in Nigeria. The result demonstrates that the transport sector has positive impact on economic growth in Nigeria.

Pradhan and Bagchi (2013) studied the effect of transportation (road and rail) infrastructure on economic growth in India over the period 1970–2010. The study adopted the Vector Error Correction Model (VECM) and discovers bidirectional causality between road transportation and economic growth. The study also found bidirectional causality between road transportation and capital formation, bidirectional causality between gross domestic capital formation and economic growth, unidirectional causality from rail transportation to economic growth and unidirectional causality from rail transportation to gross capital formation.

Nogzi and Mulikat (2010) investigated the contribution of transportation investment, congestion and traffic related accident to economic growth in Nigeria between 1975 and 2006. The study adopted the error correction mechanism with the real GDP as the dependent variable and the explanatory variables consisting of physical capital, labour force, total road network, automobile density and traffic related accident. Employing the extended Cobb Douglas production function model, the study reveals that transport investment positively contributes to economic growth and traffic accidents contributes negatively.

Ogun (2010), examined the impact of infrastructural development on poverty reduction in Nigeria employing secondary data for the period 1970 to 2005 and the structural vector autoregressive (SVAR) technique in the analysis. The study discovers that infrastructural development leads to poverty reduction which leads to increase in economic growth. The findings also indicate that though infrastructure in general reduces poverty and increase economic growth, social infrastructure explains a higher proportion of the forecast error in poverty indicators relative to physical infrastructure.

Canning and Bennathan (2000) studied the rates of return to paved roads for a panel of 41 countries over the past 4 decades and found that the highest rates of return to road infrastructure are clearly seen in countries with infrastructure inadequacies. The study also analyzed whether physical capital, human capital, labor, and other infrastructure variables are complements or substitutes to roads and reveals that the length of paved roads is highly complementary with physical and human capital, but observed that the marginal return to roads declines rapidly if the length of roads is increased in isolation from other inputs. The study concludes that infrastructure investments are not sufficient by themselves to yield large changes in output.

RESEARCH METHODOLOGY

This study made use of historical research model to evaluate the influence of transportation infrastructure investment on economic growth in Nigeria. The estimation period covers a thirty year period since the data needed are available for this period. This study covers the Nigerian public sector. The data for this study are obtained mainly from secondary source. For the secondary data, the national G.D.P. and transportation infrastructure investment are presented as contained in the Central Bank of Nigeria statistical bulletins. The period covered is 1981 to 2011.

Data Analysis and Tests

The simple linear regression model was employed to test the hypothesis of concern by establishing two variables: dependent and independent variables. The dependent variable is economic growth with G.D.P. as a proxy; the independent variable is transportation infrastructure investment. Analysis was executed with the aid of the Statistical Package for Social Science (SPSS, version 22.0). The determination of the variables follows the trend in Manukaji and Nwadialor (2016), Ngwakwe (2008), Lyon (2007).

Variables Description and Measurement for Secondary Data

The variables for this study are described in the data treatment model. The model explains economic growth as a function of transportation infrastructure investment

The model can be specified as this:

GDP = $\beta 0 + \beta 1 TII + e$

β Where GDP= Gross Domestic Product.

β0   = Gross Domestic Product

$\beta1$ = the slope representing the per unit rate of change for model

TII = Transportation Infrastructure Investment

e = the random error component for the model

GDP is the dependent variable, while TII is the independent variable.

Test of hypothesis

Influence of Transportation infrastructure investment on economic growth

Test of Hypothesis 1

Ho_1: Transportation infrastructure investment does not significantly influence economic growth in Nigeria

Decision Rule:

Reject H_{01} if the p-value is less than 0.05. Otherwise, do not reject H_{01}.

Analysis of regression result

Effect of Transportation Infrastructure investment on Gross Domestic Product (GDP)

Table 1: Summary of regression model result for GDP (n= 30).

Model	R	R Square	Adjusted R Square	Std. Error of the estimate	Sig
1	.433	.401	.396	2.528	0.000

a. Predictors: (Constant), Transportation Infrastructure Investment

b. Dependent Variable: Economic Growth

Source: SPSS Output, 2020

Table 1 presents the summary of regression result for Gross Domestic Product. The value of R is 0.633. The R value of 63% represents the correlation between Transportation Infrastructure Investment and Gross Domestic Product. It portrays a moderate correlation between the two variables. The R_2 which shows the explanatory power of the independent variable is 0.401. This implies that 40% of the variation of the Gross Domestic Product is explained by the independent variable. The R_2 value as shown by the result is quite temperate which mean that about 60% of the variation in the dependent variable is unexplained by the model, depicting a moderate relationship between the explanatory variable, Transportation Infrastructure Investment and Gross Domestic Product.

Table 2: Summary of ANOVA for GDP (n= 30).

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	419.575	1	419.575	65.670	.0000 [b]
With in Groups	626.135	29	6.389		
Total	1045.710	30			

a. dependent variable: Economic Growth

b. Predictor: Transportation Infrastructure Investment

Source: SPSS Window Output, 2020.

The fitness of the model can also be explained by F-ratio in Table 2. The F-ratio in the model is 65.670, which is very significant at $P<0.05$. This means that there is significant evidence to infer that transportation infrastructure investment is linearly related to gross domestic product.

Table 3: Summary of Coefficients of regression model for GDP (n= 30).

Unstandardized	Coefficients		Standardized Coefficients		
Model	B	Std, Error	.Beta	.T	Sig. 1
(Constant)					
	4.007	1.590		8.104	.000
TII	.594	.073		633	.000

Dependent Variable: GDP

Source: SPSS Output, 2020.

Table3 depicts the model as GDP=4.007+0594. For a given unit of Transportation Infrastructure Investment, Gross Domestic Product brigs about (positive) increase in Gross Domestic Product. The t-value for Transportation Infrastructure Investment is 8.104. This value is also significant at p-value<0. 05.

DISCUSSION OF RESULTS

This result supports the findings in earlier studies on government spending on infrastructure and economic growth (Iheanacho, 2016; Udoka, & Anyingang, 2015; Darma, 2014). These results are working or occurring with the estimates championed in the theories tested. The result of our analysis upheld the theory of public expenditure and is in line with the theory of economic growth, supports the Solo-Swan modern-day theory, and confirms that infrastructure grows an economy.

CONCLUSION AND RECOMMENDATION

This study borders on transportation infrastructure investment contributed to the Nigerian economy as a result and has mostly achieved its aim and objectives. Hence, it has provided empirical evidence in support of the fact that transportation infrastructure investment can affect economic growth to some extent. This study concludes that transportation infrastructure investment has significant effects on economic growth in Nigeria. This study therefore, concludes that transportation infrastructure investment has significant effects on economic growth in Nigeria, and recommends that:

1. Government should take a more cautious look at transport infrastructure investments as a source of revenue as they relate with GDP in Nigeria. On the other hand they can be encouraged in an attempt to increase economic growth in Nigeria.

2. The paper also, recommends the expansion of transport infrastructure (both road and rail) along with gross capital formation that will lead to substantial growth of the Nigerian economy. Therefore, within its stated scope, this study suggests that a suitable transport policy should be retained to boost transportation infrastructure investments and hence sustainable economic growth in Nigeria.

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APPENDIX 1.

INDICATORS OF TRANSPORTATION INFRASTRUCTURE AND ECONOMIC GROWTH IN NIGERIA.

REAL GDP TRANSCON INTRAN

Year	REAL GDP	TRANSCON	INTRAN
1981	205,222.06	7,981.85	32.42
1982	199,685.25	6,292.03	36.82
1983	185,598.	14 5,448.76	31.77
1984	183,562.95	5,023.44	38.97
1985	201,036.27	5,988.56	50.67
1986	205,971.44	5,267.00	51.48
1987	204,806.54	5,268.71	180.58
1988	219,875.63	5,320.91	227.20
1989	236,729.58	5,332.18	295.20
1990	267,549.99	5,438.84	287.80
1991	265,379.14	5,620.68	238.60
1992	271,365.52	5,880.47	552.39
1993	274,833.29	6,143.80	2,027.01
1994	275,450.56	6,179.31	445.50
1995	281,407.40	6,289.54	1,080.90
1996	293,745.38	6,457.61	2,068.47
1997	302,022.48	6,685.92	1,579.11
1998	310,890.05	6,974.29	1,921.49
1999	312,183.48	7,256.69	11,121.78
2000	329,178.74	7,508.13	3,034.68
2001	356,994.26	7,858.42	33,933.40
2002	433,203.51	9,226.37	29,387.12
2003	477,532.98	9,338.02	22,678.99
2004	527,576.04	13,993.70	8,071.88
2005	561,931.39	14,882.05	8,041.30
2006	595,821.61	15,911.46	9,800.00
2007	634,251.14	17,017.60	32,200.00
2008	672,202.55	18,204.25	67,400.00
2009	718,977.33	19,447.18	90,030.00
2010	775,525.70	20,754.69	178,700.00

2011   834161.83   22,154.04   13,103.12

Source: CBN Statistical bulletin (2010 Edition)