



Government spending on infrastructure and economic growth in Nigeria

Shakirat Adepeju Babatunde

To cite this article: Shakirat Adepeju Babatunde (2018) Government spending on infrastructure and economic growth in Nigeria, *Economic Research-Ekonomska Istraživanja*, 31:1, 997-1014, DOI: [10.1080/1331677X.2018.1436453](https://doi.org/10.1080/1331677X.2018.1436453)

To link to this article: <https://doi.org/10.1080/1331677X.2018.1436453>



© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group



Published online: 01 May 2018.



Submit your article to this journal [↗](#)



Article views: 2246



View Crossmark data [↗](#)

Government spending on infrastructure and economic growth in Nigeria

Shakirat Adepeju Babatunde 

School of Postgraduate Studies, Department of Accounting, University of Lagos, Akoka, Lagos, Nigeria

ABSTRACT

This study aims to investigate government spending on infrastructure. Both primary and secondary data are used for the study. The secondary data comprise of reported annual spending on selected infrastructure and annual Gross Domestic Products for 1980 to 2016 for Nigeria. The data treatments used for the secondary data are unit root and co-integration tests using Augmented Dickey–Fuller and Phillip–Perron model. Weighted least square was used to test the sample of 37-year annual time series using vector error correction model. For the primary data, a sample of 242 respondents is utilised for the study. Statistical random sampling was used for the sample selection. The data analysis was done with descriptive statistics. Findings from the study indicate 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. An element of fiscal illusion was observed in the government spending on agriculture and natural resources indicating that government is not contributing as much as the private sector in spending on agriculture and natural resources infrastructure in Nigeria.

ARTICLE HISTORY

Received 18 July 2017
Accepted 27 December 2017

KEYWORDS

Economic growth; fiscal illusion; government spending; infrastructure; agriculture

JEL CLASSIFICATIONS

M: Business Administration and Business Economics, Marketing, Accounting and Personnel Economics;
H: Public Economics;
Q: Agricultural and Natural Resource Economics, Environmental and Ecological Economics

1. Introduction

1.1. Background

Infrastructure is a strategic economic growth driver. Its potentials are numerous; it serves as a catalyst for public development in the entire government agenda, such as healthcare delivery, transportation, education and food security. Infrastructure level affects the developmental ratings of a nation. Infrastructure contributes to the score of Nigeria's economic growth. Nwachukwu and Emoh (2011) explain that the investment attraction of building development by the public sector is strategic to all areas of the economy. Government expenditure on infrastructure is enormous because it is capital-intensive. Infrastructure

CONTACT Shakirat Adepeju Babatunde  pejubabs_saki@yahoo.com, yasinfatiha1995@gmail.com

© 2018 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

expenditure grows the economy because it affects most human endeavours in various fields of life such as production, construction, technology and procurements.

However, the government spending on infrastructure in Nigeria seems to be a waste of scarce resources and to the detriment of the taxpayers because the growth in the economy does not physically depict infrastructural development. For example, Nigeria has failed in producing electricity nationwide. Food is costly. Drinkable water is scarce in many areas of the country. Moreover, the wellness statistics, such as poverty rates, are high (Raheem, Ayana, & Fashedemi, 2014).

There are divergent views by scholars as to whether or not government spending affects economic growth. Chan, Ramly and AbdKarim (2017) find that the value added tax (V.A.T.) system enhances the effect of efficient government spending on economic growth. Connolly and Li (2016) find that an increase in public social expenditure has a significant adverse effect on economic growth, and Babalola (2015) finds that government expenditure has a significant positive impact on economic development in Nigeria. Iheanacho (2016) investigated the contribution of government expenditure in Nigeria and found a negative and significant long-term relationship between economic growth and recurrent expenditure. Mitchell (2005) argues that government spending by its nature is often economically destructive regardless of how it is financed.

1.2. Statement of the problem

Nigeria is currently experiencing an economic downturn due to dwindling oil revenue, upon which the country relies for its sustenance. There is also a high level of corruption. Transparency International's (2016) corruption perception index (C.P.I.) ranks Nigeria 136th out of 176 countries surveyed. According to Trading Economics (2016), the gross domestic product (G.D.P.) of Nigeria shows a declining trend of -2.06% and -1.5% for 2016 and 2015, respectively, due to falling oil revenue. Nigeria is the third most corrupt country in West Africa.

Governments continue to increase spending on infrastructure with a view toward economic growth to ease the burden of citizens. Specifically, efficient transportation and communication should be available, people should enjoy basic healthcare delivery with minimal effort and there should be food security; but, ironically, this is not the case. The problem is that the economic growth recorded has not translated into improved welfare as expected in some nations (Babatunde, 2015; Mitchell, 2005). This problem is of concern to this study because the trend has to be reversed. Therefore, this study is based on an objective that considers the identified problem and is necessary because scholars are still arguing over the matter based on their divergent views. For instance, Mandl, Dierx and Ilzkovitz (2008) suggest that there should be further improvement in the efficiency and effectiveness of public spending. Nonetheless their study does not cover developing nations where there is a shortage of such research. The present study fills this gap in that it covers Nigeria, which is a developing nation. Their study is not specific as to what improvements are needed and how to address these, nor is the theoretical underpinning relied upon in the study discussed. The current study uses a theoretical framework to help fill this gap and makes recommendations based on the findings. Odior (2011) finds that investing in education is one of the pro-growth policies for promoting economic growth; however, the study does not explain the theoretical underpinning for such conclusion.

In addition, Raheem, Ayeni and Fashademi (2014) find that there is poor implementation of developmental policies using secondary data but provide no theoretical underpinning for the conclusion. The present study is based on some established public sector and economic theories. Darma (2014) examines federal capital expenditure and its impact on economic growth in Nigeria. The study finds that there is a mismanagement of funds by government officials but does not relate this finding to economic growth; the theoretical underpinning is also ignored. Aregbeyeni and Kolawole (2015) find that there is no causality between government spending and economic growth, but will there be economic growth if the government folds its arms and spends nothing? Although highly doubtful, the study does not resolve this. The current study uses empirical analysis with a statistically tested method to drive home its points of arguments, and the interpretation of its findings is based on a theoretical framework. Recently, Connolly and Li (2016) investigated government spending and economic growth in Organisation for Economic Cooperation and Development (O.E.C.D.) countries and found that an increase in spending heads in the opposite direction from that of economic growth.

It is essential to check this trend of poor statistics in the best interest of citizens. The question of what theoretical frameworks are used and how reliable the theories are is related to this topic; these theories need to be examined to set a solid basis for the arguments emanating from this study out of concern over government spending on infrastructure and economic growth, and further research is necessary given the consequences for citizens' welfare. Therefore, this study investigates government spending on infrastructure and its effects on economic growth in Nigeria.

1.3. Aim and objectives

This study aims to provide a scholarly contribution to the knowledge in the area of government spending on infrastructure for improving economic growth through an empirical and analytical procedure. Therefore, the objectives are to find out whether:

- i. Government spending on transportation and communication infrastructure affects economic growth in Nigeria;
- ii. Government spending on education affects economic growth in Nigeria;
- iii. Government spending on health affects economic growth in Nigeria; and
- iv. Government spending on agriculture and natural resources affects economic growth in Nigeria.

1.4. Research question

A research question is formulated as follows:

What is the extent to which government spending on infrastructure affects economic growth in Nigeria?

This research question is answered based on a hypothesis formulated for this study, which is stated in the null form in the following.

1.5. Hypothesis

Ho: Government infrastructure spending does not have significant effects on economic growth in Nigeria.

1.6. Significance

The study offers important insights for the government with regard to its spending on infrastructure. This study targets the public and private actors working in the field of infrastructure development of organisations. These actors include accountants, engineers, materials procurement officers, project managers, consultants, developers, policymakers, programme designers and contractors. Moreover, researchers, students and academics will find it useful as a reference.

This study is beneficial for the oversight functions of government in public finance administration. The users of infrastructure sometimes rely on research such as this to gain insight into governance. This study exposes knowledge and information to various users, such as private individuals and electors. Additionally, donors and rating agencies may find this work useful for performance appraisal and financial analysis.

1.7. Scope

This study covers the Nigerian public sector. For the secondary data, the national G.D.P. and spending on transportation and communication, education, health, agriculture and natural resources are presented as contained in the Central Bank of Nigeria statistical bulletins for 2014, 2015 and 2016. The period covered is 1980 and 2016.

For the primary data, the focus is on Lagos State, which is one of the 36 states in Nigeria. Lagos State is selected for this study because of its endowment as the Nigerian economic nerve centre. The state spends hugely on implementing tasks such as road construction and agriculture.

Babatunde and Dandago (2014) explain that Lagos State is a fair sample representing other states of the Federation of Nigeria, especially as it is arguably the largest economy in the country. Lagos State is Nigeria's economic barometer, where over 65% of the country's commercial activities are carried out. Lagos State is the most productive state in Nigeria, with a G.D.P. of \$91 billion in 2016 and status as the fifth largest economy in Africa (<https://lagosstate.gov.ng>).

2. Review of the literature

2.1. Conceptual framework

This study is based on the appropriate literature and theories. A critical review of the literature was completed, looking for possible gaps in the existing body of research knowledge. Research objectives have been set. A research question was formulated for interrogating the research objectives. A hypothesis was formulated and stated in the null form. The hypothesis is tested using statistical tools. The methodological approach and analysis of conclusions drawn resulted in contributions to the existing field of knowledge.

2.2. Government spending on infrastructure and economic growth

There appears to be a consensus in the research that for a country to progress in its sustainable development goals, as advanced by the United Nations Development Programme (U.N.D.P.) (2015), there is a need for strong growth in national income. Improvements in infrastructure quality and economic growth are also necessary because, clearly, economic growth will affect citizens' lives positively, such as in the area of poverty reduction.

Government spending on infrastructure is critical. However, some academic research has established that government spending is harmful to economic growth because large public sectors reduce the level of economic activity and, as such, the level of economic growth (Mitchell, 2005), while other studies find that government spending improves production and economic growth (Aregbeyeni & Kolawole, 2015; Babalola, 2015). The inconsistencies in research findings call for concern, especially in matters of this nature which affect citizens' welfare. Hence, this study attempts to probe into the relationship between government spending and economic growth.

Edame and Fonta (2014) examined the impact of government expenditure on infrastructure in Nigeria based on a co-integration and error correction specification. The study analysed the results but failed to give an interpretation of the implication of the results, which is necessary for policy formulation and decision-making. The present study discusses the implication of its research findings. Mitchell (2005) investigated the impact of government spending on economic growth in the United States. The study does not cover developing economies such as Nigeria, where there is a dearth of such studies. This study fills the identified gap by covering Nigeria, which is a developing economy. Iheanacho (2016) investigates government expenditure and economic growth from 1986 to 2014, but the study did not describe the variables. Also, the study did not link its findings to the principles in the theoretical framework which underscore the study. The current study describes the research variables and goes further to argue the findings based on some applicable theories.

Studies by Abu and Abdullahi (2010) used data covering 1977 to 2007 based on secondary data. Fasoranti (2012) used data covering 1977 to 2009. Chingiro and Mbulawa (2016) used secondary data covering 2010 to 2014, but there have been developments in macro-economic issues since. The present study is current; the data analysed cover 1980 to 2016, thus both pre- and post-millennium periods are investigated. This study utilises both primary and secondary data as an innovation to contribute to the existing body of knowledge. This study also combines secondary data with primary data with a more robust interpretation of the findings. It goes a step further to discuss some core public sector theory with core Keynesian economic theories, the Wegner law of public expenditure theory and fiscal illusion theories. The findings are argued based on the underlying theories.

2.3. Theoretical framework

This study is based on the following lines of theory: stakeholder; new public management; public expenditure; fiscal illusion; Keynesian theories; and the economic theory of growth.

2.3.1. Stakeholder theory

Stakeholder theory is based on the assumptions that address morals and values in managing an organisation, originally detailed by Freeman (1984). According to Heath (2009),

stakeholder theory recognises that there are parties involved in management, such as employees, customers, contractors, financiers, communities, public agencies, political groups, trade associations, competitors and trade unions, who sometimes scrutinise government spending. Stakeholder theory is used in this study as a critical-diagnostic tool to identify the points at which stakeholders are vulnerable to breakdowns in the spending process in the absence of moral constraints on the part of government spenders. For instance, stakeholders such as electorates, taxpayers or simply citizens are interested in what the government offers from spending taxpayers' money. They expect a business-like approach to governance in the areas of utmost good faith, transparency and accountability, as enshrined in new public management theory.

2.3.2. *New public management (N.P.M.) theory*

Gruening (2001) explains that the N.P.M. movement began in the late 1970s and early 1980s. Its first practitioners emerged in the United Kingdom under Prime Minister Margaret Thatcher and in the municipal governments in the United States that had suffered most heavily from an economic recession and tax revolts, followed by New Zealand and Australia. Their successes put N.P.M. administrative reforms on the agendas of most O.E.C.D. countries and other nations as well. N.P.M. theory involves the introduction of private sector management and incentive methods into a government organisation. Advocates of this theory argue for the incorporation of the basis of private sector methods and incentive structures to improve efficiency in government. Notwithstanding that government business is not for profit, it should strive to deliver on its promises of the dividend of democracy. This is the only way its performance can be measured because there is no standard yardstick for measuring government performance. The measurement of the efficiency or effectiveness of government spending has been subjective to a large extent. Therefore, government should minimise time spent on analysing uncertainty.

2.3.3. *Public expenditure theory*

The public sector has a role to play in society to ensure the smooth running of economic activities. Also, the goals of government are sometimes numerous and have several stakeholders involved. Therefore, to avoid chaos, efficiency and equity should guide public spending (Hindrizia & Myles, 2005; Samuelson, 1955). Hindrizia and Myles (2005) explain that efficiency concerns the smooth running of public activities. Efficiency has to do with the coordination, collection and monitoring of government revenue and expenditure towards the provision of services to the stakeholders. Equity is about the fair sharing of public gains among stakeholders. 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). The theory states that for any country, public expenditure constantly rises as income growth expands.

According to Magazzino, Giolli, and Mele (2015), Wagner's law stipulates that in the process of economic development, the share of the public sector in GDP has been increasing over time. Cosimo, Lorenzo, and Marco (2015) explain that the law is premised on four principles, as follows: that growth results in increased complexity because there are new and continuing increases in public expenditure; that public expenditure increases result in urbanisation and externalities; that the goods supplied by the public sector should have a huge income elasticity of demand; and that growth results in an increase in demand with

a resultant increase in public expenditure. This study expects that if growth in expenditure matches economic growth, then it should also translate into economic development; however, this has not been the case in reality in developing nations like Nigeria because sometimes there are elements of fiscal illusion in government activities.

2.3.4. Fiscal illusion theory

The theory of fiscal illusion originates from the work of Puviani (1903) (as cited in Mourao, 2008) and with additional impetus from Buchanan (1967). Fiscal illusion is about the misperception of fiscal parameters. According to Oates (1985), fiscal illusion implies persistent views and biases about public budgetary decisions in any direction based on imperfect information. Afonso (2014) argues that the benefits of government programmes appear to be remote and unrecognised by citizens, while citizens feel more directly the impact of sources of financing the budget, such as taxes. The essence of the theory is to expose the fact that sometimes the real programme of government is concealed to accommodate unnecessary spending. This theory is relevant to this study because the real benefits of infrastructure spending may not necessarily translate into economic growth in the same expectation because of the element of illusion in the system. Oates (1985) argues that the misconception of fiscal parameters could considerably distort economic choices. This study explains the findings based on this theory as an opportunity to show the direction of fiscal illusion in the cost and benefits analysis of government spending on infrastructure towards the ideology of economic growth.

2.3.5. Economic growth theory

The ideology of economic growth has had a long history, since the eighteenth century when Adam Smith published his *Wealth of Nations*, which centres on the pursuit of growth. Economic growth is an increase in the monetary value of goods and services of a country over a given period, as indicated by G.D.P.

However, since the 1980s, the growth critique was gradually replaced by the view of 'decoupling' of economic growth from environmental deterioration. Such a 'decoupling' view was emphasised by the World Commission on Environment and Development as a key strategy of sustainable development in their report 'Our Common Future' (1987). In recent years, the possibility of such decoupling has been increasingly questioned by critics, and they instead propose zero-growth or even de-growth. Thus far, the defenders of growth still stand in the dominant position. The scope of the opponents' arguments has expanded from its initial focus on resource limits and environmental degradation to a broader range of issues. 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 G.D.P. adjusted for inflation, and a nation is expected to continually improve its G.D.P. for sustainability.

There are three types of economic growth theory: classical; neo-classical; and the Solo-Swan modern-day theories. This study attempts to investigate the Solo-Swan modern day theory, which focuses on three factors that affect economic growth, including labour, capital and technology, with particular focus on technology regarding infrastructure advancement and economic growth regarding G.D.P. According to Wells (2015), the Solo-Swan theory argues that it is technological advancement that grows an economy because labour and capital adjust according to the advance recorded in technology. The study argues that when government spending is zero, there is little economic growth because enforcing contracts,

protecting life and property and infrastructure development would be complicated. Hence, government spending is necessary as supported by Keynesian theory.

2.3.6. Keynesian theory

The theories forming the basis of Keynesian economics were first presented by the British economist John Maynard Keynes (1936) during the Great Depression in his book *The General Theory of Employment, Interest and Money*. According to Blinder (2008), Keynes contrasted his approach with the aggregate supply-focused classical economics that preceded his book. The interpretations of Keynes that followed are contentious. Keynesian theory presupposes that government intervention can stabilise an economy, especially during a recession when there is little money to spend. The theory argues that with government technological intervention, there is increased spending and employment (Jahan, Mahmud, & Papageorgiou, 2014). However, some scholars, such as Aregbeyeni and Kolawole (2015) and Mitchell (2005), argue that Keynesian theory sometimes fails because lower tax rates have been found to boost economic growth. The study states that the Keynesian mindset is still alive among politicians and journalists, who often advocate the need to raise spending to enhance growth. However, in practical terms it is possible to spur economic advancement through tax concessions to attract investors and grow foreign direct investments; this has helped in some United Arab Emirates states like Dubai.

3. Method

The method comprises the research design, tests and analysis of the results

3.1. Research design

This research has no control over the data used; the research design is a mixed method cross-sectional survey design, which combines both primary and secondary data. Survey design has many advantages, including that it is cost effective and has a wide coverage. As an innovation, a triangulation approach to primary and secondary data is used for this study because that is the trend in current research efforts. Obtaining stakeholders' opinions allows for an opportunity to hear from the source to corroborate the facts of history gathered from secondary data.

Earlier studies on infrastructure and economic growth have established that data can be gathered through a secondary method. For instance, Jahan, Mahmud, and Papageorgiou (2014), Fasoranti (2012) used secondary data. This study covers time series data on G.D.P. as a proxy for economic growth and government spending on infrastructure for transportation and communication, education, health, agriculture and natural resources from 1980 to 2016 as contained in the Central Bank of Nigeria statistical bulletin for 2014, 2015 and 2016. The choice of the data used was informed by previous studies (Iheanacho, 2016; Edame & Fota, 2014; Fasoranti, 2012). The primary data sampling frame comprises 237 Lagos residents whose work interfaces frequently with infrastructure and economic growth.

3.2. Data analysis and tests

In this study, the secondary data are analysed and tested by establishing two variables: dependent and independent variables. The dependent variable is economic growth with G.D.P. as a proxy; the independent variables are government spending on infrastructure for transportation and communication, education, health, agriculture and natural resources. The determination of the variables follows the trend in Chingoiro and Mbulawa (2016). The statistical analysis is done with the aid of EViews statistical analysis package for Windows 7.

3.2.1. 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 some components of infrastructure spending for transport and communication, education, health, agriculture and natural resources.

The data treatment method used constitutes a unit root test using the augmented Dickey-Fuller and Phillips Perron model. The hypothesised economic growth and the government spending on infrastructure that affects it are expressed via regression equation, which is a modified version of that used in Abu and Abdullahi (2010), as follows:

$$GDPt = \delta_0 + \delta_1SAGRICNR + \delta_2STRANSCOM + \delta_3SEDU + \delta_4c + \mu t,$$

where:

GDP = Gross Domestic Product which represents economic growth

SAGRICNR = spending on agriculture and natural resources

STRANSCOM = spending on transport and communication

SEDU = spending on education

SHEALTH = spending on healthcare delivery

μt = stochastic white noise error term with zero mean and constant variance

δs = parameters to be estimated

This implies that economic growth proxied by G.D.P. is influenced basically by capital spending on agriculture and natural resources (SAGRICNR), transport and communication (STRANSCOM), capital spending on education (SEDU), and spending on healthcare (SHEALTH). The μt is a stochastic white noise error term with zero mean and constant variance, while δs are parameters to be estimated. The data utilised are shown in Appendix A1 and tested for level of stationarity, as shown in Tables 1 and 2 for the unit root test and collinearity test as addressed in the following section.

3.2.2. Unit root test

This study uses the unit root test to test for the stationarity of the times series data collected for the research to avoid the danger of bias that stationarity of data may pose to the study

Table 1. Unit root test using augmented Dickey-Fuller (A.D.F.) and Phillips-Perron (P.P.) 1980–2016.

Variable	Test stat		5% critical level		Order of integration
	ADF	PP	ADF	PP	
GDP	-10.32	-10.09	-3.54	-3.54	I (2)
AGRICNR	-4.76	-10.14	-3.57	-3.54	I (1)
TRANSCOM	-4.03	-8.97	-3.59	-3.54	I (1)
EDU	-4.00	-4.05	-3.54	-3.54	I (0)
HEALTH	-6.86	-8.62	-3.58	-3.54	I (1)

Source: Field survey 2017 analysed with Eviews7 (Q.M.S.) statistical analysis package for Windows.

Table 2. Result of unrestricted co-integration rank test (trace).

Date: 11/02/17 Time: 19:37
Sample (adjusted): 1982–2016
Included observations: 35 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP AGRICNR TRANSCOM EDU HEALTH
Lags interval (in first differences): 1 to 1

Hypothesised No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical value	Prob.**
None *	0.898688	209.6305	69.81889	0.0000
At most 1 *	0.832331	129.4963	47.85613	0.0000
At most 2 *	0.736244	66.99450	29.79707	0.0000
At most 3 *	0.440640	20.34895	15.49471	0.0086
At most 4	0.000437	0.015286	3.841466	0.9015

Trace test indicates 4 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level
** p-values

Source: Field survey 2017 analysed with EViews7.

if they are not checked. The unit root test is employed because in the literature most time series variables are non-stationary, and using non-stationary variables in the model might lead to a spurious regression. Also, a collinearity test was carried out to ascertain the reliability of the data collected. Following Engle and Granger's (1987) procedure, the augmented Dickey-Fuller (A.D.F.) and Phillips-Perron (P.P.) test are employed.

Abu and Abdullahi (2010) carried out empirical analysis on government expenditure and economic growth in Nigeria; they employed the A.D.F. to test for unit root for the stationarity of the data to avoid a spurious regression. They find that seven variables were stationary at first difference, while three were stationary at level. Okezie et al. (2013) made use of the A.D.F. and Kwiatkowski-Phillips-Schmidt-Shin test (K.P.S.S.) to test for the stationarity of data.

The simple economic relationship of a random walk with drift was adopted, and the results of the unit root tests are reported using the A.D.F. and P.P. tests. Only government spending on education infrastructure is stationary at the level; capital expenditure on health, agriculture and natural resources and transport and communication are stationary at first difference, while G.D.P. is stationary at the second difference, as shown in Table 1.

3.2.3. Co-integration test

The purpose of the co-integration test is to determine whether or not a group of non-stationary time series is co-integrated to reduce bias. Thus, in this study, Johansen tests for cointegration analysis is employed to investigate the long-term relationship between disaggregated government capital expenditure and economic growth in Nigeria. The analysis was performed under the assumption of a linear deterministic trend in the data with a sample of 37 years annual time series. Using the vector error correction model (V.E.C.M.), Gabriel and Johnson (2015) carried out a co-integration test to ascertain the long-term relationship among the variables; their result shows three co-integrating equations at the 5% significance level. The result is depicted in Table 2.

The test statistics strongly reject the null hypothesis of no co-integration in favour of four co-integration relationships. This justifies the uses of the error correction model (E.C.M.) to test the hypothesis.

3.3. Test of hypothesis

The formulated hypothesis was tested using a parsimonious E.C.M. and Weighted Least Square (W.L.S.). The regression result is shown in Table 3.

3.4. Analysis of regression result

3.4.1. Summary statistics

Table 3 depicts the result of the weighted least squares regression. From the result, the value of adjusted R-square is 0.996; this implies that there is about 99.6% of the variation in the dependent variable. Hence, the G.D.P. is explained by the explanatory variables. This shows that the model is perfect and of good fit. The F-statistics value of 549 with its zero p-value explains the overall analysis of variance of the model. It indicates that all explanatory variables are fundamental in explaining the variation in the dependent variable. Its probability value indicates its significance. More so, the test for first-order serial correlation implies that the model is free from auto or serial correlation considering the value of the Durbin-Watson (D.W.) stat of 1.84, which is within the acceptable range of 1.5 to 2.5. Thus, the result is in line with the assumption of insistence independence, which makes the utilised data reliable.

3.4.2. Regression result

The regression result in Table 3 shows that government spending on agriculture and natural resources has a significant inverse effect on economic growth at the 5% level of significance. It therefore implies that the success recorded in the agricultural sector in Nigeria is largely

Table 3. Parsimonious error correction mechanism (E.C.M.): weighted least square (W.L.S.).

Dependent variable: D(GDP,2)				
Method: Least squares				
Date: 11/02/17 Time: 17:45				
Sample (adjusted): 1988–2006				
Included observations: 10 after adjustments				
Weighting series: DGDP				
Weight type: Inverse variance (average scaling)				
White heteroscedasticity-consistent standard errors & covariance				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	−481.454**	163.3141	−2.948027	0.0421
D(AGRICNR,1)	−0.02287*	0.006293	−3.634965	0.0221
D(TRANSCOM,1)	0.18002*	0.007624	23.61144	0.0000
EDU	0.02961*	0.002227	13.30008	0.0002
D(HEALTH,1)	0.0722**	0.028271	2.554072	0.0630
ECM(-1)	−0.82484*	0.156601	−5.267204	0.0062
Weighted Statistics				
R-squared	0.998545	Mean dependent var	626.6763	
Adjusted R-squared	0.996727	S.D. dependent var	847.1905	
S.E. of regression	25.68505	Akaike info criterion	9.613404	
Sum squared resid	2638.886	Schwarz criterion	9.794955	
Log likelihood	−42.06702	Hannan-Quinn criterion.	9.414243	
F-statistic	549.1441	Durbin-Watson stat	1.848741	
Prob(F-statistic)	0.000009	Weighted mean dep.	925.8924	
Unweighted Statistics				
R-squared	0.987528	Mean dependent var	457.3420	
Adjusted R-squared	0.971938	S.D. dependent var	487.9524	
S.E. of regression	81.73986	Sum squared resid	26,725.62	
Durbin-Watson stat	1.342887			

Note: *, ** indicate significant at 1% and **5% level others at * 10%.

Source: Field survey 2017 analysed with EViews 9 (Q.M.S.) statistical analysis package for Windows.

contributed by the private sector. This is why food is not guaranteed in an average home as it comes from a profit-oriented sector and is expensive because of the pursuit of profit for which the private sector is characterised. This shows an element of fiscal illusion in the impression of the stakeholders about government spending on agriculture and mineral resources: rather than the government, it is the private sector that drives agriculture in Nigeria. Mourao (2008) explains that the situation of fiscal illusion present in government spending varies around the world.

The result further shows direct effects of transport and communication (TRANSCOM) on economic growth with a coefficient of .18002 at the 10% level of significance. It can thus be interpreted that a million naira in government spending on transport and communication infrastructure brings about an N0.18 m rise in G.D.P. A cursory examination of this finding shows that the mobile phone revolution in Nigeria might have added value to the economic growth.

Government spending on education and health infrastructure has direct effects on economic growth at the 1% and 5% levels of significance, respectively. Co-integration is revealed in the model. It shows that there is a long-term relationship between the dependent variable and its explanatory variables. The speed of adjustment to equilibrium in its current period is 82.4%. This result justifies the use of an E.C.M. for the specification of the model. The result is statistically robust and significant at the 1% level.

3.5. Analysis of primary data

For the primary data, a questionnaire was used as the research instrument. The anonymity of respondents and confidentiality of responses are used to ensure that unbiased data are collected.

The questionnaire contains a set of questions classified into two major sections: A and B. Section A features four questions on the bio-data of the respondents, which include residential area and length of stay in Lagos State. The inclusion of these variables is necessary as they help to classify the respondents properly as well as analyse their responses. Section B of the questionnaire comprises 'yes' and 'no' questions designed mainly to provide information for answering the research question. The data obtained from the field are analysed using descriptive statistics.

3.5.1. Instrument validation

The research instrument was subjected to content validation to ensure that the content of the instrument measures the variables investigated in the study. The first draft of the questionnaire was given to two Ph.D. students in accounting. Based on their suggestions, improvements were made; the improved copy was given to a post-graduate lecturer who also provided input. The input was incorporated into the final copy. Also, a reliability test was performed on the data collected; it resulted in a Cronbach's alpha of .640. This result implies that the data are highly reliable.

3.5.2. Sampling

The study population totals 1050 respondents, made up of all the e-tag customers of Lekki Concession Company, which is an award-winning road infrastructure company in Lagos State. The sample size is 289 respondents from the population of 1050 and was determined

using Yamane's (1967) formula. According to Yamane (1967), the formula is $n = N/1 + N(e)^2$, where n is the sample size, N is the population size and e is the margin of error.

N = Population of 1050

e = Margin of error of 5%

$n = 1050/1 + 1050(e)^2$

$n = 1050/1 + 1050(0.05)^2$

$n = 289$

The sampling technique adopted is stratified random sampling. Due to time constraints and other exigencies, 84% or 237 copies of the questionnaire out of the 289 sampled were successfully analysed, which is representative of a high success rate.

3.6. Analysis of the findings from the primary data

The results are depicted in Tables 4–6. Tables 4 and 5 are used to explain the profiles of the respondents.

Table 4 indicates that about 73% of the respondents have been living in Lagos State for over 10 years, while approximately 16.5% have resided in Lagos for between five and 10 years. This means the respondents are informed citizens on the issues concerning the subject matter.

Table 5 shows that the respondents reside in every geo-political zone of the five divisions of Lagos State. The majority are in the prime areas of the state, which are Lagos Island and Ikeja at 51.7% and 20.2%, respectively.

Table 6 depicts the descriptive statistics of the primary data gathered from respondents. As shown in Table 6, this study uses mean and standard deviation to measure the dispersion and deviation, or how far an average is representative of the mass. Therefore, the mean deviation in the descriptive statistics in Table 6 is used to explain the reliability of the respondents' views.

Table 6 shows a mean score of 1.49 and a standard deviation of .501 for item 1 under government spending on transportation and communication infrastructure. Item 2 on education similarly records a standard deviation of less than 1 at .318. This score is near the maximum obtainable of 2. These scores indicate that respondents agree that government spending on transportation and communication and education infrastructure meets people's expectations. Items 3 on agriculture and natural resources records a standard deviation of .697, which is the highest standard deviation recorded, meaning that respondents are not in agreement in their views about spending on agriculture and natural resources infrastructure. Item 4 on spending on healthcare infrastructure depicts low mean scores of 1.70. The

Table 4. Length of stay in Lagos State.

		Frequency	Percent
Valid	BELOW 5 YEARS	20	8.3
	5–10 YEARS	40	16.5
	ABOVE 10 YEARS	177	73.1
	Total	237	97.9
Missing	System	5	2.1
Total		242	100.0

Source: Field survey 2016.

Table 5. Residential area in Lagos State.

		Frequency	Percent
Valid	IKORODU	20	8.2
	BADAGRY	7	2.9
	IKEJA	49	20.2
	LAGOS ISLAND	125	51.7
	EPE	36	14.9
	Total	237	97.9
Missing	System	5	2.1
Total		242	100.0

Source: Field Survey 2016.

Table 6. Descriptive statistics of items tested in the questionnaire.

Item No.		N	Minimum	Maximum	Mean	Std. deviation
1.	Does government spending on transportation and communication infrastructure meet people's expectations?	237	1	2	1.49	.501
2.	Is Lagos State's spending on education infrastructure adequate?	237	1	2	1.89	.318
3.	Does the government provide credible assurance to the people of Lagos State in terms of spending on agriculture and natural resources?	237	1	2	1.56	.697
4.	Do you like the initiative of the Lagos State government in healthcare infrastructure?	237	1	2	1.70	.458

Source: Field survey 2016.

standard deviation is also below 1 at .458, which shows that healthcare spending meets the standard requirement for good performance.

4. Results discussion

These results support the findings in earlier studies; for instance, researchers find an alignment between spending on infrastructure and economic growth (Iheanacho, 2016; Udoka & Anyingang, 2015; Darma, 2014).

These results are in tandem with the values advocated in the theories tested. Efficiency in the public sector pays off, as held forth by the theory of public expenditure and N.P.M. theory. On the whole, in line with the theory of economic growth, the result supports the Solo-Swan modern-day theory. The results confirm that infrastructure grows an economy.

As for government spending on agriculture and natural resources infrastructure, both the primary and secondary data on spending on agriculture depicted the weakest results among the four criteria investigated in this study. This result supports the findings in Fasoranti (2012) and gives credence to the argument of Cosimo, Lorenzo, and Marco (2015) on Wagner's law because spending rises without multiplying into the desired objective for expenditures, which is to reduce hunger. Alas, matters of agriculture are matters of hunger and as such matters of life and death. Therefore, the inverse relationship depicted by the regression analysis and the respondents' divergent views of government spending on agriculture and natural resources are worrisome. This result indicates that more has to be done

in agriculture and natural resources. The people are expected to at least have food, and there is nobody who can survive without agriculture. Perhaps an adherence to the tenets of the public expenditure theory of efficiency and equity could improve the situation.

The opinion of Mitchell (2005) on the Keynesian theory, which states that government spending on infrastructure may not result in economic growth, is supported to some extent. This result suggests an improvement on the Keynesian theory of economics.

5. Conclusion and recommendation

5.1. Conclusion

This study concludes that government spending on transportation and communication, education and health has significant effects on economic growth in Nigeria, while spending on agriculture and natural resources infrastructure has an opposite effect on economic growth in Nigeria. This study has mostly achieved its aim and objectives. It has provided empirical evidence in support of the fact that government spending on infrastructure can affect economic growth to some extent. Also, government spending on infrastructure should be guided by sound governance toward a business-like approach to spending in line with N.P.M. and public expenditure theories.

5.2. Contribution to knowledge

This study makes several contributions to the existing body of knowledge on government spending on infrastructure for improving economic growth. First, a contribution to the knowledge from this result is that there is an improvement to Keynesian theory; an argument emanates from this study that there is a level to which spending on infrastructure will reach before it can make an impact on citizens' lives. If it does not reach this threshold, it may be worsening the economic situation of a nation regarding infrastructure and the expectation from its utilisation, with a consequence on citizens' lives. Second, there is a contribution to the literature that seeks to identify the effects of government spending on economic growth. Third, this study is a contribution to the debate on the actualisation of the U.N.D.P. (2015) Sustainable Development Goals in the area of food security. Fourth, the methodology adopted is extensive, combining both primary and secondary data for a robust analysis. Fifth, the empirical pieces of evidence posted serve as reference points. Sixth, the results of this study are comparable with the research findings in similar studies worldwide. The study conforms to statistical research directions with an added value of non-generalisation of the interpretation of analytical standards in all matters. The study exposes some areas needing further attention by policymakers, specifically in agriculture and natural resources.

5.3. Recommendations

The previous findings bear some implications for policy formulation. There is a need to improve government spending on agriculture and natural resources infrastructure in the best interest of citizens.

There is an urgent need to diversify into agriculture based on the economic downturn which over-reliance on oil revenue has primarily caused. Besides, it is an avenue for food security, job creation and poverty alleviation.

A business-like approach to government spending on infrastructure which ensures efficiency and equity should be incorporated within public governance.

5.4. Limitation of the study

This study addresses spending activities in Nigeria; the results could be tested in similar developing countries. The study includes four items of government infrastructure spending, and future studies may cover other areas of government spending not covered in this study.

Disclosure statement

No potential conflict of interest was reported by the author.

ORCID

Shakirat Adepeju Babatunde  <http://orcid.org/0000-0001-5822-1883>

References

- Abu, N., & Abdullahi, U. (2010). Government expenditure and economic growth in Nigeria, 1970–2008: A disaggregated analysis. *Business and Economics Journal*, 4, 1–11.
- Afonso, W. B. (2014). Fiscal illusion in state and local finance- A hindrance to transparency. *Sage Journals*, 46(3), 219–228. doi:10.1177/0160323X14550103
- Aregbeyeni, O., & Kolawole, B. O. (2015). Oil revenue, public spending and economic growth relationships in Nigeria. *Journal of Sustainable Development*, 8(3), 114–123.
- Babalola, A. I. (2015). Fiscal policy and economic development in Nigeria. *Journal of Economic and Sustainable Development*, 6(7), 150–160.
- Babatunde. (2015). Effects of internal control system deficiency on contractors' infrastructural development capability in the Nigerian public sector. *Chinese Business Review*, 14(12), 573–582. doi:10.17265/1537-1506/2015.12.002
- Babatunde, S. A., & Dandago, K. I. (2014). Internal control system deficiency and capital project mismanagement in the Nigerian public sector. *Procedia - Social and Behavioural Sciences*, 164, 208–221.
- Blinder, A. S. (2008). "Keynesian economics". *Concise encyclopaedia of economics*. Retrieved from <http://www.econlib.org/library/Enc/KeynesianEconomics.html>
- Buchanan, J. M. (1967). Cooperation and conflict in public goods interaction. *Economic Inquiry*, 5(2), 109–121.
- Chan, S., Ramly, Z., & AbdKarim, M. (2017). Government spending efficiency on economic growth: Roles of value-added tax. *Perspectives on East Asian Economics and Industries*, 46(2), 162–188.
- Chingoiro, S., & Mbulawa, S. (2016). Economic growth and infrastructure expenditure in Kenya: A Granger-Causality approach. *International Journal of Social Science Studies*, 4(9), 1–9.
- Connolly, M., & Li, C. (2016). Government spending and economic growth in the OECD countries. *Journal of Economic Policy Reform*, 19(4), 386–395. doi:10.1080/17487870.2016.1213168
- Cosimo, M., Lorenzo, G., & Marco, M. (2015). Wagner's law and Peacock and Wiseman's displacement effect in European union countries: A panel data study. *International Journal of Economics and Financial Issues*, 5(3), 812–819.
- Darma. (2014). Federal capital expenditure and its impact on economic growth in Nigeria; 1980–2010. *Developing Country Studies*, 4(4), 24–33.

- Edame, G. E., & Fonta, W. M. (2014). The impact of government expenditure on infrastructure in Nigeria: A co- integration & error correction specification. *International Journal of African and Asian Studies*, 3, 50–63.
- Engle, R. F., & Granger, C. W. J. (1987). Cointegration and error correction: Representation, estimation and testing. *Econometrica*, 55, 251–276.
- Fasoranti, M. M. (2016). The effect of government expenditure on infrastructure on the growth of the Nigerian economy, 1977–2009. *International Journal of Economics and Financial Issues*, 2(4), 513–518.
- Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston Massachusetts, MA: Pitman.
- Gabriel, C. N., & Johnson, I. O. (2015). Capital expenditure at disaggregated level and economic growth in Nigeria: An empirical analysis. *International Journal of Science and Research*, 4(6), 729–737.
- Gruening, G. (2001). Origin and theoretical basis of new public management. *International Public Management Journal*, 4, 1–25.
- Heath, J. (2009). The uses and abuses of stakeholders theory. *Business Ethics Quarterly*, 19(04), 497–528.
- Hindrizia, J., & Myles, G.D. (2005). Theories of the public sector. *Intermediate Public Economics* (pp. 69–87). Cambridge: MIT Press
- Iheanacho, E. (2016). The contribution of government expenditure on economic growth of Nigeria Disaggregated Approach. *International Journal of Economics & management sciences*, 5(5), 1–9. doi:10.4172/2162-6359.1000369
- Jahan, S., Mahmud, A. S., & Papageorgiou, C. (2014, September). What is Keynesian economics? *Finance & Development*, 51(3), 53–54.
- Keeble, B. R. (1987). The Brudent report: Our common future. *Journal of Medicine and War*, 4(1), 17–25. doi:10.1080/07488008808408783
- Keynes, J. M. (1936). *The general theory of employment, interest and money*. Retrieved from <http://etext.library.adelaide.edu.au>
- Magazzino, C., Giolli, L., & Mele, M. (2015). Wagner's Law and Peacock and Wiseman's displacement effect in European Union countries: A panel data study. *International Journal of Economics and Financial Issues*, 5(3), 812–819.
- Mandl, U., Dierx, A., & Ilzkovitz, F. (2008). *The effectiveness and efficiency of public spending*. Retrieved from http://ec.europa.eu/economy_finance/publications. doi:10.2765/22776
- Mitchell, D. J. (2005). The impact of government spending on economic growth. *Heritage Foundation*, 1831, 1–18.
- Mourao, P. R. (2008). *Towards a fiscal illusion index*. Retrieved from campus.usal.es/~XVEEP/.../J1S5/Towards%20a%20Fiscal%20Illusion%20Index1.pdf
- Nwachukwu, C. C., & Emoh, F. (2011). Building construction project management success as a critical issue in real estate development and investment. *American Journal of Social and Management Sciences*, 2(1), 56–75.
- Oates, W. E. (1985). *On the nature and measurement of Fiscal Illusion: A Survey*. Retrieved from <https://books.google.com-ng/books>
- Odior, E. S. O. (2011). Government spending on education, economic growth and long waves in a CGE micro-simulation analysis: The case of Nigeria. *British Journal of Economics, Finance and Management Sciences*, 1(2), 74–87.
- Okezie, A. I., Nwosu, C., & Njoku, A. C. (2013). An assessment of Nigeria expenditure on the agricultural sector: Its relationship with agricultural output (1980–2011). *Journal of Economics and International Finance*, 5(5), 177–186.
- Raheem, S., Ayana, J. O., & Fashedemi, A. O. (2014). Easing the “Disease” of poverty in Nigeria. *Developing Country Studies*, 4(19), 55–66.
- Raheem, S., Ayeni, J. O., & Fashedemi, A. O. (2014). Easing the “Disease” of poverty in Nigeria. *Developing Country Studies*, 4(19), 55–66.
- Samuelson, P. A. (1955). Diagrammatic exposition of a theory of public expenditure. *The Review of Economics and Statistics*, 37(4), 350–356.

- Trading Economics (2016). *GDP growth rate*. Retrieved from <http://www.tradingeconomics.com/country>
- Transparency International (2016). *Corruption by country/territory*. Retrieved from <http://www.transparencyinternational.com>
- Udoka, C., & Anyingang, R. A. (2015). The effect of public expenditure on the growth and development of nigerian economy (1980–2012). *International Review of Management and Business Research*, 4(3), 824–835.
- United Nations Development Programme (UNDP). (2015). *Sustainable development goals*. Retrieved from <http://www.undp.com>
- Wells, K. (2015). *What is economic growth? - Definition, theory & impact*. Retrieved from <http://www.study.com/academy>
- Xue, J. (2010). *Arguments for and against economic growth*. Retrieved from <http://www.barcelona.degrowth.org>
- Yamane, T. (1967). *Statistics: An introductory analysis* (2nd ed.). New York, NY: Harper and Row.

Appendix

Table A1. G.D.P. and capital expenditure in million naira 1980–2016.

Year	G.D.P.	Transport and communication	Education	Agriculture and natural resources	Health
1980	140.98	2349.3	952.6	435.6	147.2
1981	144.83	1625.7	440.9	775.1	128.4
1982	154.98	1283.9	488.0	1035.1	130.2
1983	163.00	1094.4	346.6	1185.2	136.0
1984	170.38	261.9	144.9	252.5	51.1
1985	192.27	241.0	180.7	985.4	56.2
1986	202.44	516.1	442.0	892.5	81.2
1987	249.44	375.1	139.1	365.1	69.5
1988	320.33	703.7	281.8	595.7	183.2
1989	419.20	683.8	221.9	981.5	126.0
1990	499.68	877.4	331.7	1758.5	257.0
1991	596.04	353.4	289.1	551.20	137.6
1992	909.80	625.3	384.1	763.0	188.0
1993	1259.07	1436.7	1563.0	1820.0	352.9
1994	1762.81	1293.5	2405.7	2800.1	961.0
1995	2895.20	3800.3	3307.4	4691.7	1725.2
1996	3779.13	8819.7	3215.8	3892.8	1659.5
1997	4111.64	7147.7	3808.0	6247.4	2623.8
1998	4588.99	6227.5	12,793.0	8876.6	7123.8
1999	5307.35	3313.7	8516.6	6912.6	7386.8
2000	6897.48	3020.9	23,342.6	5761.7	6569.2
2001	8134.14	19,241.0	19,860.0	57,879.0	20,128.0
2002	11,332.25	17,083.2	9215.0	32,364.4	12,608.0
2003	13,301.56	6639.6	14,680.2	8510.9	6431.0
2004	17,321.30	9750.70	21,550.0	48,047.8	26,410.0
2005	22,269.98	19,982.5	27,440.8	79,939.4	21,652.6
2006	28,662.47	6531.1	35,791.8	15,176.8	38,039.8
2007	32,995.38	35,529.4	48,293.5	22,518.5	51,171.0
2008	39,157.88	80,100.0	48,800.0	106,000.0	97,200.0
2009	44,285.56	106,200.0	43,400.0	138,900.0	52,500.0
2010	54,612.26	68,900.0	87,900.0	78,000.0	35,000.0
2011	62,980.40	58,800.0	35,400.0	62,900.0	39,500.0
2012	71,713.94	59,600.0	47,600.0	63,400.0	45,000.0
2013	80,092.56	62,876.0	32,401.5	78,500.0	29,363.9
2014	89,043.62	100,568.0	40,847.1	104,000.0	40,735.8
2015	94,144.91	103,549.0	56,900.0	115,200.0	46,819.0
2016	101,489.49	115,462.0	56,698.0	113,890.0	47,748.0

Source: C.B.N. statistical bulletin and annual reports 2014, 2015 and 2016.