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EFFECT OF GOVERNMENT INFRASTRUCTURAL SPENDING (ROADS AND WATER SUPPLY) ON CASSAVA OUTPUT IN NIGERIA: 1980-2014

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Abstract

This study analysed the effect of government infrastructural spending (roads and water supply) on cassava output in Nigeria (1980-2014). Data were collected from secondary source and were analysed using ordinary least square. The result shows that the coefficient of determination (R^2) was 0.725 indicating that 72.5% of the variation in cassava output was explained by government expenditures on water supply and roads. The result also showed that the coefficient of government expenditure on roads (822.76) was positive and significant at 5% level of probability.The result further showed that the coefficient of government expenditure on roads (822.76) was positive and significant at 5% level of probability.The result of the effect of increase in government expenditures on roads and water supply on cassava output by 5%shows that the simulated value of cassava (scenario 1) ranges between 20542720 to 47604530 tons with a mean of 30486424 tons and standard deviation of compared to the baseline which ranges between 20533640 to 46306800 tons with a mean of 30003839 tons and standard deviation of 11251794.The result of the effect of increase in government expenditures on roads and water supply on cassava output by 10%shows that the simulated value of cassava (scenario 2) ranges between 20515490 to 43711330 tons with a mean of 29038667 tons and standard deviation of 10126614 compared to the baseline which ranges between 205336406306800 tons with a mean of 30003839 tons and standard deviation of 11251794.It was therefore recommended that more investment should be done on infrastructure (roads and water supply) since itpositively affect cassava output significantly.

Keywords: Simulation, infrastructure, public expenditures

Introduction

Recognizing Nigeria's tremendous agricultural potentials, the government has accepted the view that the country should resolve most unequivocally to make agriculture the mainstay of the economy. Production of surpluses should occur simultaneously with adequate processing, storage and distribution if the surpluses are not to waste. In other words, surpluses without appropriate processing may bring about significantly increased post-harvest regime losses, which can enormously reduce expected productivity and income in the agricultural sector (RUSEP, 2002; Yisa, 2009). Several factors have influenced public expenditure on infrastructure, namely, rate of urbanization, openness, government revenue, external reserves, population density, and type of government abilities (Edame, 2009; Abolarin, 2017). Public expenditure refers to the expenses government incurs for its own maintenance, society and the overall economy which continuously increase overtime. This is because these fiscal operations are recognized as major tools for the management of the economy and stimulation of economic growth and development (NISER, 2004; Agenor and Doson, 2006;Abolarin, 2017). The services generated by infrastructure investment lead to growth in the production of firms. The flow of infrastructure services is the main measure of economic benefits from these sectors, and that an efficient allocation of resources in this area should be in response to effective demand for services (Edame and Fonta, 2014;Abolarin, 2017). Development economists have long acknowledged the centrality of public expenditure, particularly on infrastructure as an important instrument in the development process. Public expenditure has remained a central issue in economic development, especially developing countries in Sub-Saharan Africa, whose economies are characterized by structural rigidities, weak support services and institutional framework, declining productivity, high level corruption cum policy instability. This gloomy picture has led to researches aimed at investigating whether public expenditure on infrastructure has yielded significant results over time (Edame, 2009; Abolarin, 2017). President Goodluck Jonathan'sadministration prioritised agriculture since the inception of his administration with aim to repositioning agriculture to drive Nigeria's economy. called the Agricultural Transformation Agenda (ATA), the goal was to add extra 20 million metric tons of food to Nigeria's domestic food supply by 2015 through deregulation of seed and fertilizer sectors; marketing reforms to structure markets; innovative financing for agriculture and new agricultural investment framework (www.thisdaylive.com). Under the same agenda, the Federal government policy to spur an accelerated production of cassava flour and especially turn Nigeria from dependence on wheat with the installation of industrial scale cassava production machinery and deploy hundreds of compact modular milling

systems that will allow the bakers mix their own cassava flour with wheat flour in the right ratios. Nigeria's wheat imports dropped from an all-time high of 4.051 million metric tonnes in 2010 to 3.7 million metric tonnes in 2012 (www.lordsonekpetu.org).

Methodology

The Study Area: The study was conducted in Nigeria. Nigeria is situated in the Western part of Africa. Its coastal boundary is delimited by Gulf of Guinea to the south and the land boundary is shared by Cameroon and Chad to the east, Niger to the north and Benin to the west. Abuja is Nigeria's capital city and Lagos is its largest commercial city. Nigeria covers a total area of 923,768 sq. km. making it the thirty second largest country of the world. It has a small coastline of 853 km in comparison to its total land boundary of 4047 km. The latitudinal and longitudinal extent of the country is 4° to 14°N and 2° to 15°E, respectively (www.mapsofworld.com/lat-lon/nigeria).

Method of Data Collection: Data were obtained from secondary sources such as: the Central Bank of Nigeria for government expenditures on water supply and roads. World factfish for the cassava output.

Model Specification:

$$Y_t = \alpha + \beta_1 X_{1t} + \beta_2 X_{2t} + \varepsilon_t \quad \text{.....(}$$

Y_t is cassava output in tons

X_{1t} is government expenditure in water supply (Naira)

X_{2t} is government expenditure in roads (Naira)

ε_t is error term

Results and Discussion

Effect of public infrastructural spending on cassava output in Nigeria

The result of the effect of public infrastructural spending on cassava output in Nigeria is presented in table 1. The result shows that the coefficient of determination (R^2) was 0.725 indicating that 72.5% of the variation in cassava output was explained by government expenditures on water supply and roads. The result also that the coefficient of government expenditure on roads (822.76) was positive and significant at 5% level of probability indicating that a unit increase in government expenditure on roads (822.76) will increase cassava output by 822.76 tons. This could be attributed to the fact that investment on

infrastructure facilitates transportation of inputs to farms. This result disagrees with Abolarin (2017) who found that government expenditures on roads decreased agricultural growth in Nigeria. However, the coefficient of water supply was not significant. Therefore, government expenditures on water supply has no significant effect on cassava output.

Table 1: Effect of public infrastructural spending on cassava out put in Nigeria

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROADS	822.7698	348.5942	2.360251	0.0245
WATER_SUPPLY	47.83227	116.6257	0.410135	0.6844
C	20352118	1599358.	12.72518	0.0000
R-squared	0.725355	Mean dependent var		30003838
Adjusted R-squared	0.708190	S.D. dependent var		13211324
S.E. of regression	7136685.	Akaike info criterion		34.48121
Sum squared resid	1.63E+15Z	Schwarz criterion		34.61453
Log likelihood	-600.4212	Hannan-Quinn criter.		34.52723
F-statistic	42.25706	Durbin-Watson stat		1.226257
Prob(F-statistic)	0.000000			

Effect of increase in government expenditures on roads and water supply on cassava output by 5%

The result of the effect of increase in government expenditures on roads and water supply on cassava output by 5% is presented in table 2 and figure 1. The result shows that the simulated value of cassava (scenario 1) ranges between 20542720 to 47604530 tons with a mean of 30486424 tons and standard deviation of compared to the baseline which ranges between 20533640 to 46306800 tons with a mean of 30003839 tons and standard deviation of 11251794. This could be attributed to the fact that investment on infrastructure facilitate transportation of inputs to farms. This result disagrees with Abolarin (2017) who found that government expenditures on roads decreases agricultural growth in Nigeria.

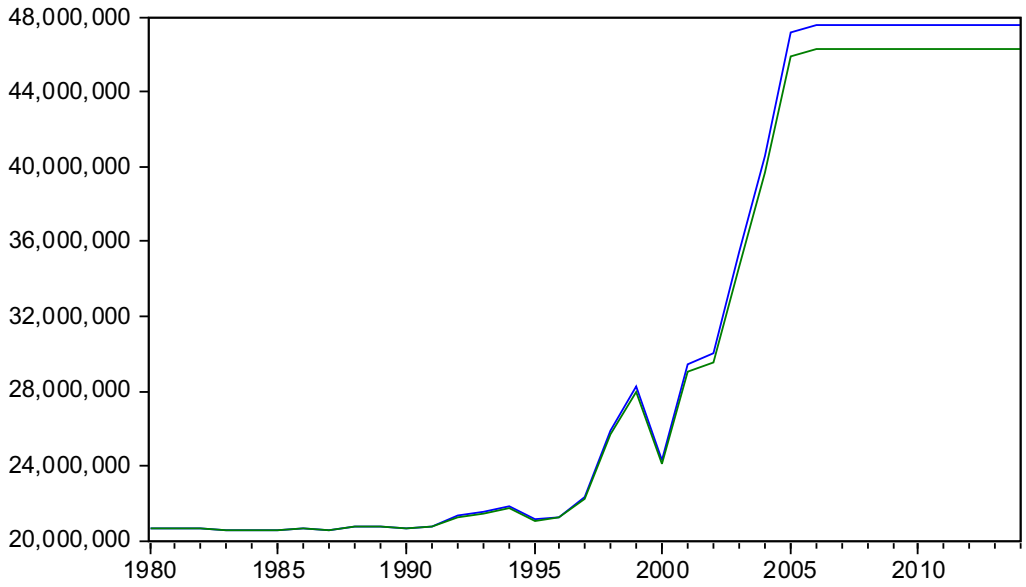

Figure 1: **Effect of increase in government expenditures on roads and water supply on cassava output by 5%**

Table 2: 5% increase in roads and water supply

	Baseline	**Scenario 1**
Mean	30003839	30486424
Median	22199870	22292260
Maximum	46306800	47604530
Minimum	20533640	20542720
Std. Dev.	11251794	11814382
Skewness	0.632872	0.632871
Kurtosis	1.576216	1.576216
Jarque-Bera	5.292681	5.292681
Probability	0.070910	0.070910
Sum	1.05E+09	1.07E+09
Sum Sq. Dev.	4.30E+15	4.75E+15
Observations	35	35

Effect of decrease in government expenditures on roads and water supply on cassava output by 10%

The result of the effect of increase in government expenditures on roads and water supply on cassava output by 10% is presented in table 3 and figure 2. The result shows that the simulated value of cassava (scenario 2) ranges between 20515490 to 43711330 tons with a mean of 29038667 tons and standard deviation of10126614 compared to the baseline which ranges between 20533640 to 46306800 tons with a mean of 30003839 tons and standard deviation of 11251794. This could be attributed to the fact that investment on infrastructure facilitate transportation of inputs to farms. This result agrees with Abolarin (2017) who found that government expenditures on roads decreases agricultural growth in Nigeria.

Table 3: 10% decrease in roads and water supply

	Baseline	**Scenario 2**
Mean	30003839	29038667
Median	22199870	22015100
Maximum	46306800	43711330
Minimum	20533640	20515490
Std. Dev.	11251794	10126614
Skewness	0.632872	0.632871
Kurtosis	1.576216	1.576216
Jarque-Bera	5.292681	5.292681
Probability	0.070910	0.070910
Sum	1.05E+09	1.02E+09
Sum Sq. Dev.	4.30E+15	3.49E+15
Observations	35	35

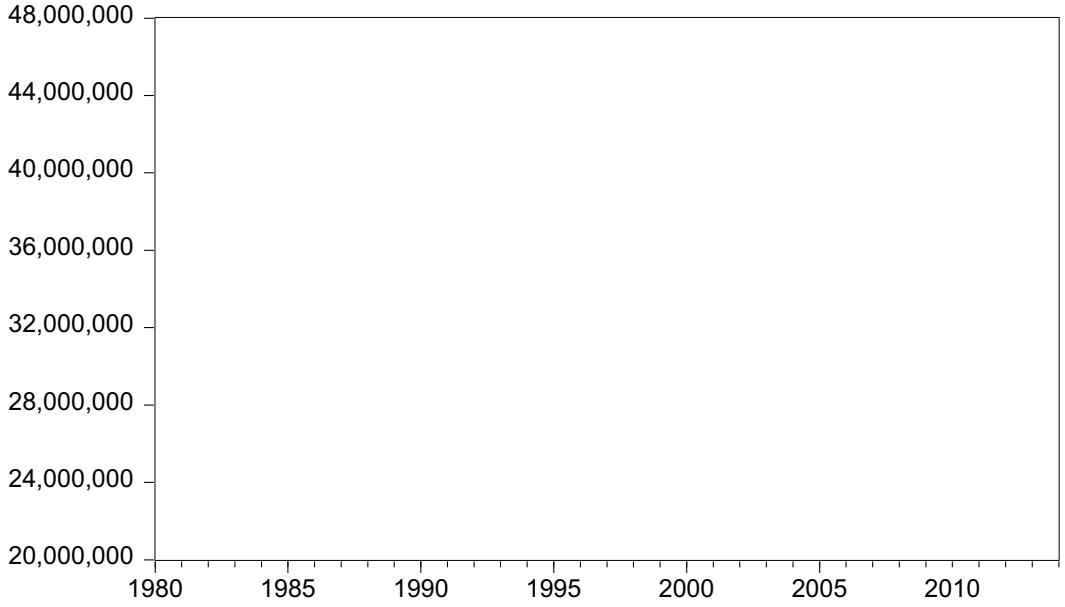

Figure 2: Effect of decrease in government expenditures on roads and water supply on cassava output by 10%

Conclusion and Recommendations

This study analysed effect of government infrastructural spending (roads and water supply) on cassava output in Nigeria from 1980 to2014. The study found that government infrastructural spending (roads and water supply) significantly affected cassava output under the period of study. It was therefore recommended that more investment should be done on infrastructure (roads and water supply) since its affect cassava output significantly

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