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IMPACT OF TRANSPORT AND COMMUNICATION CAPITAL EXPENDITURE ON ECONOMIC GROWTH IN NIGERIA, 1986-2022

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ABSTRACT: *One of the major impediments to the improvement of the transport and communication sector is inadequate capital spending. Despite the readiness of the government to upgrade the critical infrastructures, there still exist huge infrastructural deficits in Nigeria. Based on these, this study examines the impact of government capital expenditure on transport and communication on economic growth in Nigeria between 1986 and 2021. The study employed autoregressive distributed lag model as the method of analysis and the result reveals that in the long run, government capital expenditure on transport and communication (CEXTRC) with a coefficient value of 0.019, commercial banks' credit to the transport and communication sector (CBCTRC) with a value of 0.025 and government revenue (GOVR) with a value of 0.065 have positive and significant impact on economic growth in Nigeria. The results also reveal that the inflation rate (INFR) with value of -0.16 has a negative and insignificant impact on economic growth in Nigeria. The short run result found that CEXTRC with value of 0.02, CBCTRC with a value of 0.04, GOVR with a value of 0.21 all have positive and significant impact on economic growth. INFR however shows a negative impact with a coefficient value of -0.28. The study therefore recommends that the government should prioritize the transport and communication sector by allocating more funds in order to provide good transport and communication systems such as railways, roads, waterways, internet, highways and so on. These would help to reduce costs of production, improve better accessibility to markets, create businesses and employment opportunities which will have a multiplier effect on economic growth, by enhancing it.*

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INTRODUCTION

Transportation is one of the important key sectors that contribute to the growth and development of an economy. It generally involves the movement of people and goods from one place to another which enhances cultural, economic and social interactions. Transport system includes road, railway, air and water transport. On the other hand, communication is one of the fastest-growing sectors in Nigeria. It comprises myriads of outfits such as television, radio, mobile phones, and internet, amongst others (National Bureau of Statistics [NBS], 2017). These sectors help to promote the use of natural resources, mobility of skilled labor force, diversification of markets, provision of raw materials amongst others. Efficient means of transport and communication systems have helped to shorten time, distance, and cost that would have been used to move and deliver goods and information from one person to another. With timely information and good transportation systems, the incidences of insecurity can be reduced. Transportation and communication help to increase the size of the market of products by helping to transport products across different countries which help to increase sales in those countries by penetrating new markets (Razi, 2020).

Owing to the importance of transport and communication, the developed and developing economies of the world have spent and are still spending huge amounts of money to develop transport and communication sectors in order to contribute to the growth and development of their economies. World Economic Outlook (2014) revealed that a 1 percent increase in government spending would increase the level of output by 0.4 percent in the same year and by 1.5 percent after four years. The speedy growth in China has been accompanied by the massive development in transport and communication infrastructures (Ke et al., 2020). Kenya is one country in Africa that has significantly increased its goods and services value through major development in information and communication, and transport infrastructure (Maluki, 2022).

Over the years, Nigeria's allocation for capital projects has suffered a setback. In 2019 and 2020, the federal government has only allocated about NGN 137.6 billion and NGN 121.37 billion respectively to the transport and communication sub-sector. This shows a decline in 2020 allocation. Nigeria is facing an infrastructural deficit as a result of challenges such as inadequate funding and graft (BudgiT, 2020). The government has always expressed its readiness to upgrade the critical infrastructure in the country but this is not happening fast enough (Central Bank of Nigeria, 2021). The National Integrated Infrastructure Master Plan emphasized that Nigeria requires an investment of US$3 trillion over the next 30 years to bridge its infrastructural gap (Klynveld Peat Marwick Goerdeler [KPMG], 2021). According to the report by National Bureau of Statistics (2021), the communication sector contributed 14.91% to total real GDP in quarter one 2021, higher than the rate of 14.07% recorded in the same quarter of 2020 but lower than the 15.06% contributed in the preceding quarter. In real terms, the transportation sector's contribution to real GDP in the first quarter of 2021 stood at 1.38%, a fall from 1.77% recorded in the previous year (NBS, 2021). The fall in the transportation sector's contribution to GDP can be attributed to the poor transport system in Nigeria.

Consequently, in a bid to develop the Nigeria transport and communication sector, the Federal Government of Nigeria has introduced different policy initiatives such as National Digital

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Identity Policy and Highway Development and Management Initiative. However, Nigeria still experiences bad transport and communication systems (NBS, 2021). Furthermore, while a lot of empirical works abound on the relationship between transport and communication and economic growth across the globe, there exist mixed findings. For example, the studies of scholars like Narayan (2021), Barilee and Benvolio (2021), and Omokaro and Ikpere (2019) found a positive and significant relationships between transport and communication expenditure and economic growth, whereas Charles et al. (2018), and Amadi et al. (2013) established negative impact of government expenditure and economic growth in Nigeria. It is against this backdrop that this study attempts to examine the impact of transport and communication capital expenditure on economic growth in Nigeria. The paper is structured into five sections. Section one provides the introduction to the study. Section two expresses the review of literature, while section three discusses the data and methodology adopted for the study. The findings of the study are expressed in section four while the conclusion and recommendations for the study are discussed in section five.

LITERATURE REVIEW

Conceptual Review

Transportation is the means of moving people and goods from one place to another. This means can be through roads, railways, water air and pipelines. On the other hand, communication is a medium of sending and receiving information through various means such as mobile phone, television, radio, internet and many more (Razi, 2020). Transport and communication capital expenditures are expenditures made by the government to provide road, rail, water and air transports and also telecommunication services such as publishing, radio and television programmes (NBS, 2014). BudgiT (2020) refers to transport and communication capital expenditure as funding for numerous railway, waterways, road and air projects, provision of information and communication working tools and capacity building, broadcasting services, development of cellular market and so on. The definition of BudgiT (2020) forms the working definition for this study because the essence of spending on the transport and communication sector is well explained.

World Bank (2020) defines economic growth as the value of all the final output of goods and services produced by all sectors of the economy within a country's boundaries, in a single year. It is measured by using gross domestic product and serves as an indicator of the scale of a country's economy. Economic growth is an expansion in a country's economy. The Central Bank of Nigeria (2017) also describes economic growth as the monetary value of goods and services produced in an economy during a period of time irrespective of the nationality of the people who produced the goods and services. It is calculated without making deductions for depreciation. On the other hand, Jhingan (2011) defines economic growth as quantitative sustained increase in a country's per capita income which is as a result of expansion in the labor force of a country, level of consumption, capital formation and volume of trade. Thus, economic

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growth is operationalized by this study as the value of all the production made in the economy over a period of one year.

Theoretical Review

Keynesians' Theory of Public Expenditure

This theory was propounded by Keynes (1936) after the great depression. He sees government expenditure as a driving force that can contribute positively to sectoral growth in the economy which will in turn foster economic growth. According to the theory, government intervention through fiscal policy will lead to an increase in government spending which will in turn increase employment, production and output. Keynes regards public spending as an exogenous factor that can be used as a policy instrument to promote growth. He believed that government intervention would help correct market failures. Keynes emphasized that during depression, increased saving would not help but spending. He further asserts that depression could be avoided, if government spending is increased. This will automatically result in a rise in aggregate demand. Keynes believed that during recession, the economy can progress only if the government could increase its spending on both social and economic services. Keynesians argued that because prices and wages are not flexible, thus, fluctuations in any of the components of spending which include consumption, investment or government expenditures would lead to output changes. If government spending increases, and all other spending components remain constant, then output will increase.

This theory has however been criticized that government should not be involved in economic activities, and that markets have a mechanism for self-adjustment which will quickly bring back the economic activities to its normal or previous level (Keynes, 1936).

The implication of this theory however, is that if government increases public expenditure, and applied the resources in an efficient manner, its multiplier effects will trickle down to investors and the society at large, thereby, increasing the rate of employment opportunities, per capita income, production, as well as output (Keynes, 1936).

This theory is relevant to this study because of its emphasis on government intervention in enhancing growth by increasing government expenditure. It is a fact that government spending to the sector is small and that no individuals can singlehandedly provide the needed infrastructures in the transport and communication sub sectors without government involvement. Government expenditure on transport and communication will reduce cost of production, encourage investment in the private sector and increase profitability of firms, and consequently promote economic growth. This is one of the reasons why government expenditure in the subsectors is very important.

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Empirical Literature

A lot of empirical works abound in the literature on the impact of government expenditure on economic growth across the globe. However, this study reviewed the ones that are most relevant to the study and these are presented below.

George-Anokwuru (2023) employed ARDL to investigate the effect of transport and communications expenditure on economic growth in Nigeria. The study covered the period 1980 to 2023. The results however revealed a long run impact between capital expenditure on transport and communication and economic growth, while inflation has a negative but significant impact. In the short run, it further revealed that capital expenditure on transport and communication and inflation have a positive and significant impact on economic growth in Nigeria.

Narayan (2021) examined the impact of public expenditure on the transportation sector in Nepal using ordinary least squares method (OLS). The study used time series data collected between 1975 and 2016, and the result reveals that government capital expenditure on transportation has a positive and significant impact on economic growth in Nepal. Barilee and Benvolio (2021) assessed the relationship between government expenditure and economic development in Nigeria. The study used an ordinary least squares method to analyze the impact and covered the period from 1990 to 2020, a period of 31 years. The results however indicate a positive and significant impact between transportation expenditure, per capita income and economic development in Nigeria. Omokaro and Ikpere (2019) focused on the role of public spending on construction, transportation and communication on economic growth in Nigeria, covering the period from 1989 to 2013. The study employed multiple regression techniques and the results showed that public spending on construction has a significant positive impact on economic growth, while public spending on transportation and communication has a positive but insignificant impact on economic growth in Nigeria.

Mustapha et al. (2018) examined the impact of government expenditure on the transportation sector on economic growth in Nigeria for a period spanning from 1980 to 2016, using error correction model (ECM). The study found that government expenditure on transportation, capital expenditure and interest rate all have a positive impact on economic growth in Nigeria, but only government expenditure on transportation is statistically significant. Babatunde (2018) studied the impact of government spending on infrastructures and economic growth in Nigeria between 1980 and 2016, using a vector error correction model. The results show that government spending on transport and communication has significant effects on economic growth in Nigeria. Charles et al. (2018) also examined the impact of government expenditure on construction, transport and communication on economic growth in Nigeria from 1980 to 2016. The study employed an error correction technique of analysis and it was revealed that government expenditure on construction, transport and communication have a negative and insignificant impact on economic growth in Nigeria.

Umeh et al. (2018) empirically investigated the impact of sectoral spreads of government expenditures on economic growth in Nigeria from 1980 to 2017. The study employed an error

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correction model and it was found that government expenditures on agriculture and defense have a positive and significant impact on economic growth. The study revealed that government expenditures on education, transport and communication, and health have positive but insignificant impact on economic growth in Nigeria.

Amadi et al. (2013) examined the effect of public spending on transport infrastructure and economic growth in Nigeria from the period 1981 to 2010. The study employed an ordinary least squares method to analyze the impact and the results show that public spending on transport infrastructure has a negative and insignificant impact on economic growth in Nigeria. Ebiringa and Charles-Anyaogu (2012) critically evaluated the impact of government sectoral expenditure on economic growth in Nigeria between 1977 and 2011. A Cochrane-Orcutt and error correction methods were adopted to measure the long run effect of the selected macroeconomic variables on economic growth. The result shows that expenditures on telecommunication, defense and security, education and health sectors have a positive impact on Nigeria's economic growth. It further shows that transportation and agricultural expenditures have a negative impact on economic growth in Nigeria.

Having reviewed lots of empirical works on government expenditure on transport and communication and economic growth in Nigeria, it was revealed that studies have not specifically focused on transport and communication capital expenditure in Nigeria. While some studies focused on both recurrent and capital expenditure, some examined the impact using the disaggregated approach by selecting from each component of government expenditure. Hence, this study specifically examined the capital expenditure on transport and communication and economic growth in Nigeria. The study also included commercial banks' credit to the transport and communication sector and government revenue as variables. The inclusion of these variables makes this study different from what other studies have done, owing to the importance of these variables in enhancing economic growth through government capital expenditure on transport and communication. These variables are useful in this study because; first, it is the revenue generated by the government that will determine the amount of capital expenditure that will be made available for the development of the transport and communication sector. The commercial banks' credit to the transport and communication sector is also useful because it is another source of financing capital projects in the transport and communication sector, which gears towards enhancing economic growth.

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METHODOLOGY

Model Specification

The Keynesians theory of public expenditure forms the theoretical foundation of this study. Keynes argued that increased government expenditure would increase economic growth. Consequently, the theory models economic growth as a function of government expenditure, investment, consumption and net exports. Thus, in line with theoretical underpinning of the study, this study modifies the model of George-Anokwuru (2023). The George-Anokwuru (2023)'s model was adopted for this study because it employed the ARDL model which this study also utilized, and because some of the variables in the study of George-Anokwuru (2023) are used in this study. The model explains economic growth as a function of government capital expenditure on transport and communications sector, government recurrent expenditure on transport and communications sector, interest rate and inflation rate.

The model is thus specified mathematically as;

$$RGDP = f(GCETC, GRETC, INR, INF) \quad (3.1)$$

The model is expressed econometrically as;

$$LnRGDP_t = \varphi_0 + \varphi_1 LnGCETC_t + \varphi_2 LnGRETC_t + \varphi_3 INR_t + \varphi_4 INF_t + £_t \quad (3.2)$$

Where, RGDP = Real Gross Domestic Product; GCETC = Government Capital Expenditure on Transport and Communications Sector; GRETC = Government Recurrent Expenditure on Transport and Communications Sector; INT = Interest Rate and INF = Inflation Rate

Meanwhile, based on the focus of this study, the model modified that of George-Anokwuru (2023) to incorporate government capital expenditure on transport and communication, commercial banks' credit to transport and communication sector, government revenue and inflation rate. Some variables in the model of George-Anokwuru (2023) were dropped because this study is specifically on capital expenditure on transport and communication expenditure. Thus, the variables that affect the transport and communication sector are included. The study therefore expresses the functional form of this model as;

$$RGDP = f(CEXTRC, CBCTRC, GOVR, INFR) \quad (3.3)$$

The econometric form of the model is written as;

$$RGDP_t = \beta_0 + \beta_1 CEXTRC_{t-1} + \beta_2 CBCTRC_{t-1} + \beta_3 GOVR_{t-1} + \beta_4 INFR_{t-1} + \mu_t \quad (3.4)$$

Where, RGDP = Real Gross Domestic Product, CEXTRC = Government Capital Expenditure on Transport and Communication; CBCTRC = Commercial Banks' Credit to transport and communication sector; GOVR = Government Revenue; INFR = Inflation Rate; t-1 is the lagged value of the variables, μ is the stochastic error term which explains other variables that cannot be captured in the model. β_0 is the intercept, while β_1, β_2, β_3 and β_4 are the slopes of the coefficients.

In accordance with Pesaran et al. (2001), the ARDL model can be specified as:

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$y_t - y_{t-1} = c + (\lambda-1).\ y_{t-1} + (\beta_0 + \beta_1).\ X_{t-1} + \beta_0\ .\ \Delta X_t + \upsilon_t$ 3.5

$\Delta y_t = c + \varphi\ .\ (y_{t-1} - Ø\ .\ X_{t-1}) + \beta_0\ .\ \Delta X_t + \upsilon_t$ 3.6

Where, $\varphi = (\lambda-1)$ is the coefficient of the error correction term, $\beta = (\beta_0 + \beta_1)$ and $Ø = -\frac{\beta}{\varphi}$ are the long run coefficients of X_t. The speed of adjustment is $-\varphi$.

In this study, the ARDL model which estimates both the long run and short run relationship is presented as in accordance with Pesaran et al. (2001):

Short run Equation

$$\Delta RGDP_t = \beta_0 + \sum_{i=1}^{q} \alpha_1 \Delta lnRGDP_{t-1} + \sum_{i=1}^{q} \alpha_2 \Delta lnCEXTRC_{t-1} + \sum_{i=1}^{q} \alpha_3 \Delta lnCBCTRD_{t-1} + \sum_{i=1}^{q} \alpha_4 \Delta lnGOVR_{t-1} + \sum_{i=1}^{q} \alpha_5 \Delta lnINFR_{t-1} - ØECM_{t-1} + \mu_t \quad 3.7$$

Long run Equation

$$\Delta RGDP_t = \beta_0 + \sum_{i=1}^{q} \alpha_1 \Delta lnRGDP_{t-1} + \sum_{i=1}^{q} \alpha_2 \Delta lnCEXTRC_{t-1} + \sum_{i=1}^{q} \alpha_3 \Delta lnCBCTRD_{t-1} + \sum_{i=1}^{q} \alpha_4 \Delta lnGOVR_{t-1} + \sum_{i=1}^{q} \alpha_5 \Delta lnINFR_{t-1} + \mu_t \quad 3.8$$

Nature and Sources of Data

This study is time series in nature and the data for capital expenditure on transport and communication were sourced from National Bureau of Statistics, while the data for gross domestic product, commercial banks' credit to transport and communication sector, government revenue and inflation rate were obtained from Central Bank of Nigeria Statistical Bulletin.

Estimation Techniques and Procedures

Since the data collected for this study are time series, unit root test was conducted using Augmented Dickey Fuller unit root test. This method is chosen because it can handle bigger and more complex time series models and also adjusts for serial correlation. The ARDL Bounds test for co-integration was also conducted to establish a long run relationship among the variables. Thereafter, the ARDL model was adopted to obtain the long run and short run estimates of the variables. This method is employed because it can handle data with small sample sizes and even be applied when there are mixed orders of integration in the stationarity tests conducted, that is, I(1) and I(0).

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PRESENTATION AND DISCUSSION OF RESULTS

Descriptive Statistics

The descriptive statistics was conducted for this study to show the behavior of the data set. The result is presented in Table 1.

Table 1: Descriptive Statistics Result

	RGDP	CBCTRC	CEXTRC	GOVR	INFR
Mean	4.427167	0.921018	0.601013	2.202647	2.695260
Median	4.308633	-0.026872	0.064458	1.991669	4.030001
Maximum	4.805792	3.143649	2.151982	3.895787	7.170500
Minimum	4.182928	-0.214670	-0.552842	1.021189	5.390000
Std. Dev.	0.228615	1.474742	1.031374	1.118574	1.318680
Skewness	0.695658	0.777276	0.430352	0.457308	1.187110
Kurtosis	1.736695	1.637366	1.487180	1.567624	2.889485
Jarque-Bera	2.795929	3.383110	2.398303	2.286508	4.547729
Probability	0.247099	0.184233	0.301450	0.318780	0.102914
Sum	84.11618	17.49935	11.41925	41.85030	59.21003
Sum Sq. Dev.	0.940765	39.14757	19.14718	22.52174	38.86353
Observations	19	19	19	19	19

Source: ***Eviews 10 Output***

The result in Table 1 shows the mean values of 4.4272 for real gross domestic product (RGDP), 0.6010 for government capital expenditure on transport and communication (CEXTRC), 0.9210 for commercial banks' credit to transport and communication sector (CBCTRC), 2.2026 for government revenue (GOVR) and 2.6952 for inflation rate (INFR). The standard deviation shows that the variables have low variability with the values of 0.2286 for RGDP, 1.0314 for CEXTRC, 1.4747 for CBCTRC, 1.1186 for GOVR and 1.3187 for INFR. This implies that the estimated values for all the variables are as close as possible to their true values. The skewness values for the variables reveal that all the variables are positively skewed. The kurtosis shows that RGDP, CEXTRC, CBCTRC and GOVR are platykurtic as their values are lower than 3, meaning that the distribution is flat. On the other hand, INFR has a value that can be approximated to 3. This means that the distribution is mesokurtic, meaning the distribution is long-tailed. The distribution also shows that the series do not deviate from normal distribution as the Jarque-Bera probability values of 0.2470, 0.3015, 0.1842, 0.3188 and 0.1029 for RGDP, CEXTRC, CBCTRC, GOVR and INFR respectively are greater than the critical value at 5

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percent. This asserts that all the variables are normally distributed. Therefore, the null hypothesis that the variables are normally distributed cannot be rejected.

Test of Stationarity

The test of stationarity is necessary in a time series data because if the series are not stationary, it can produce spurious regression which will make the estimations unreliable. To avoid the spurious regression, the ADF test was conducted and the result is presented in Table 2.

Table 2: Summary of the ADF Unit Root Test

Variables	ADF @Level	Critical Value @5%	ADF@ Ist Diff.	Critical Value @5%	Order of Integration
RGDP	-0.79945	-2.94113	-3.99408	-2.94113	I(1)
CEXTRC	-0.87363	-2.94113	-9.08437	-2.94113	I(1)
CBCTRC	-0.73495	-2.94115	-5.01542	-2.94115	I(1)
GOVR	-1.42927	-2.93899	-6.19497	-2.94115	I(1)
INFR	-3.57007	-2.94115	-6.46503	-2.94343	I(0)

Source: ***Eviews 10 Output***

The Augmented Dickey Fuller test presented in Table 2 shows that the variables such as RGDP, CEXTRC, CBCTRC and GOVR are stationary at first difference, while INFR is stationary at level. This is seen in the ADF statistics against the critical values at 5 percent as the ADF values in absolute terms are greater than the critical values at 5 percent level. This leads to the rejection of the null hypothesis that the variables have unit root. It is then concluded that the variables are stationary and the estimates can produce consistent and unbiased results. Based on this mixed order of integration, the ARDL Bounds test was conducted to show the long run relationship.

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Lag Length Selection

This section presents the appropriate lag length for this study before estimating the long and short run coefficients of the model.

Table 3: VAR Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-64.92005	NA	0.002573	8.225889	8.470952	8.250249
1	31.17592	124.3595*	7.02e-07*	-0.138343*	1.332033*	0.007815*

* indicates lag order selected by the criterion
Source: ***Eviews 10 Output***

Table 3 presents the lag length criteria used to select the optimum lag length for the model of this study. From the result, lag one is chosen as the appropriate lag length, since all the criteria chose lag one.

ARDL Bounds Test for Cointegration

The ARDL Bounds test for cointegration was employed in this study to ascertain the presence of long run relationship amongst the variables. The result is presented in Table 4.

Table 4: ARDL Bounds Test for Cointegration

Test Statistic	Value	K
F-statistic	14.81169	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.12	3.23

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5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: ***Eviews 10 Output***

Table 4 presents the summary of ARDL Bounds test for cointegration to establish a long run relationship among the variables. The result however shows that there is cointegration among the variables since the F statistics value of 14.8117 is greater than the upper and lower bound at 5 percent critical level. This leads to the rejection of the null hypothesis which states that there is no long run relationship among the variables. It is therefore concluded that there is a long run relationship amongst the variables.

Autoregressive Distributed Lag Result

Based on the bounds test for cointegration which shows a long run relationship among the variables, the long run and short run estimates are conducted and the results are presented in Tables 5 and 6 respectively.

Table 5: Long Run Estimate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.952125	0.493077	1.930985	0.0774
CBCTRC(-1)	0.025339	0.038074	3.034212	0.0061
CEXTRC(-1)	0.019529	0.129678	2.255343	0.0344
GOVR(-1)	0.065130	0.004169	2.422643	0.0395
INFR(-1)	-0.156313	0.000231	-0.272552	0.7898
RGDP(-1)	0.227378	0.123708	3.444599	0.0018

The result of the long run estimate in Table 5 shows that the coefficient of the lagged value of real gross domestic product (RGDP) is 0.2274 with the p value of 0.0018. This shows that there is a positive and significant relationship between the past value of RGDP and its current value. The result also shows that commercial banks credit to transport and communication sector (CBCTRC), government capital expenditure on transport and communication (CEXTRC) and government revenue (GOVR) have positive and significant impact with RGDP. The coefficients stand at 0.0253 for CBCTRC, 0.0195 for CEXTRC and 0.0651 for GOVR. This implies that 1 percent increase in CBCTRC, CEXTRC and GOVR on average, will lead to the increase of RGDP by 0.03 percent, 0.02 percent and 0.07 percent respectively. The p values for the variables (CBCTRC, CEXTRC, GOVR) which are lower than 5 percent critical level indicates that the variables are statistically significant at 5 percent level. The coefficient of the lagged value of

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inflation rate (INFR) shows a negative value of -0.1563, meaning that 1 percent increase in INFR will decrease RGDP by 0.16 percent in the long run.

Table 6: Short Run Estimate

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.003338	0.010966	0.304391	0.7686
D(RGDP(-1))	0.743849	0.364952	4.632336	0.0000
D(CEXTRC(-1))	0.022830	0.071220	4.001993	0.0001
D(CBCTRC)	0.040689	0.049409	0.823515	0.0021
D(GOVR(-1))	0.211759	0.932825	2.501941	0.0138
D(INFR(-1))	-0.280205	0.000211	-0.214234	0.8357
ECM(-1)	-0.642753	0.166795	-3.802506	0.0002

R-squared	0.793795	Mean dependent var	0.019057
Adjusted R-squared	0.614141	S.D. dependent var	0.015119
S.E. of regression	0.014230	Akaike info criterion	5.362220
Sum squared resid	0.001620	Schwarz criterion	5.031796
Log likelihood	47.21665	Hannan-Quinn criter.	5.365739
F-statistic	7.933146	Durbin-Watson stat	2.209840
Prob(F-statistic)	0.000037		

Source: ***Eviews 10 Output***

The short run estimate in Table 6 reveals that CEXTRC is positive and statistically significant. The coefficient value is 0.02280 and the p value is 0.0001. This implies that 1 percent increase in government capital expenditure on transport and communication will increase the real gross domestic product by 0.022 percent. This conforms to the a priori expectation because it is expected that when the government spends money on transport and communication sectors, time, distance and costs of delivering goods will be reduced. It will also drive a lot of investments and employment generation, thereby enhancing output growth. The findings of this study corroborate the findings of Omokaro and Ikpere (2019) and Umeh et al. (2018) who found that public spending on transport and communication has a positive impact on economic growth in Nigeria.

The coefficient of commercial banks' credit to transport and communication also exerts a positive and significant impact on economic growth. The coefficient value is 0.0407 with the p value of 0.0021. This suggests that 1 percent increase in commercial banks' credit to transport and communication sectors will increase real gross domestic product by 0.041 percent. This is expected as it conforms to the a priori expectation. The implication of this is that, despite the

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inconsistency of the commercial banks in giving credits to the transport and communication sector, the funds have been widely utilized and have contributed to the growth of the economy during these years.

The coefficient of government revenue stands at 0.2118 with the p value of 0.0138. This suggests a positive and significant impact and it implies that 1 percent increase in government revenue will increase real gross domestic product by 0.212. This is expected as it conforms to the a priori expectation, because any increase in government revenue will lead to an increase in government spending in the critical sector like transport and communication.

Furthermore, the coefficient of inflation rate shows a value of -0.2802 with the p value of 0.8357 which is greater than the critical value at 5 percent. This implies that 1 percent increase in inflation rate will decrease real gross domestic product by 0.28 percent. The finding conforms to the a priori expectation because when there is persistent increase in the prices of goods and services, the worth of government spending in transport and communication sector reduce, and this will affect the contribution of transport and communication sector to real gross domestic product. The finding supports the findings of George-Anokwuru (2023) who also revealed in his study that high inflation rate is detrimental to the growth of the economy.

The error correcting term as indicated by ECM, has the expected negative sign of -0.6428 with the p value of 0.0002. This implies that any disequilibrium in the previous years would be corrected for in the current year with a speed of about 64 percent. Based on the rule of thumb which states that the closer the value is to 1, the faster the speed of adjustment, hence, any disequilibrium will quickly be corrected for.

The R^2, that is, the goodness of fit is 0.7938 and it means that 79 percent variations in real gross domestic product are explained by government capital expenditure on transport and communication, commercial banks' credit to transport and communication sectors, government revenue and inflation rate while the remaining 21 percent variations are explained by error term. Thus, the estimates are reliable and can be used for economic predictions.

The F-statistic value of 7.933146 shows that the variables are jointly statistically significant at 5 percent level of significance. The Durbin- Watson (DW) statistic suggests that the model is free from autocorrelation since the value of DW (2.2098) is approximately 2.

Post-Estimation Diagnostic Tests

The post estimation tests are carried out to ascertain the reliability and robustness of the estimates. Hence, Breusch-Godfrey serial correlation and Breusch-Pagan-Godfrey heteroskedasticity tests are conducted in this regard.

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Table 6: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.092209	Prob. F(1,15)	0.7656
Obs*R-squared	0.116085	Prob. Chi-Square(1)	0.7333

Source: ***Eviews 10 Output***

The test of Breusch-Godfrey was conducted to establish if there is serial correlation in the model or not. The result as indicated in Table 6 shows that the probability value of F-statistic (0.7656) is greater than the critical value at 5 percent. The null hypothesis which states that there is no serial correlation in the model is thus accepted.

Table 7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.285058	Prob. F(2,16)	0.3037
Obs*R-squared	2.629611	Prob. Chi-Square(2)	0.2685
Scaled explained SS	1.653735	Prob. Chi-Square(2)	0.4374

Source: ***Eviews 10 Output***

The result in Table 7 shows that there is no heteroscedasticity in the model. This is because the probability value of F-statistic of 0.3037 is greater than the critical value at 5 percent. This therefore leads to the rejection of the null hypothesis and the study concludes that the model is homoscedastic.

CONCLUSION AND RECOMMENDATIONS

The study empirically investigates the impact of government capital expenditure on transport and communication on economic growth in Nigeria from the period spanning 1986 to 2021. The autoregressive distributed lag (ARDL) model was employed to estimate the parameters of the model. The findings however reveal that both in the long and short run, government capital expenditure on transport and communication, commercial banks' credit to transport and communication and government revenue are significantly and positively related to economic growth in Nigeria. The result further reveals that the inflation rate is negative and insignificant to economic growth in Nigeria. Based on these, the study concludes that transport and communication sectors are crucial to the growth of Nigeria's economy. The following recommendations are therefore made by this study:

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i. Government should prioritize the transport and communication sector by allocating more funds in order to provide good transport and communication systems such as railways, roads, waterways, internet, incubation hub, Information and Communication Technology (ICT) working tools and so on;

ii. Nigerian commercial banks should make it a priority by extending more credits to transport and communication sectors as this would help to stimulate the growth of Nigeria economy;

iii. Government should cut down on administrative costs and also extend the tax base so as to increase revenue. This would help the government to increase capital expenditure on the transport and communication sector; and

iv. Government should also ensure that inflation is reduced to a single digit. This can be achieved if the government can encourage industrial production by creating an enabling environment for investors to invest in industries.

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