Econometrics Analysis of the Impact of Some Selected Economic Services Spending on Nigeria Economy

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Abstract
This study focused on econometrics analysis of the impact of Road and Construction Spending (RCS) as well as Transport and Communication spending (TCS) as selected Economic Services Spending on Nigeria Economy proxy by Gross Domestic Product (GDP) during the period 1981-2022. The study used time series data like GDP, RCS and TCS sourced from the Central Bank of Nigeria (CBN) Statistical bulletin and National Bureau of Statistics. The data were subjected to Unit root diagnostic test to determine whether they are stationarity or otherwise. The data were integrated of order 1(0) and 1(1), hence, the need for Autoregressive Distributed Lag (ARDL) model and the Error Correction Model (ECM) technique was also adopted to check for the speed

of adjustment. The finding reveals that Road and Construction Spending (RCS) as well as Transport and Communication Spending (TCS) have positive and insignificant impact on GDP. Therefore, the researchers recommend that more still need to be done by all ties of government to improve road and communication networks that will enhance sustainable economic growth in Nigeria.

Key words: *GDP, RCS, TCS, ARDL, ECM*

INTRODUCTION

Government expenditure remains an important instrument utilized in the process of development. It plays a pivotal role in the functioning of any economy at almost all stages of growth and development. Most developing and developed countries today use public expenditure to improve income distribution, direct the allocation of resources in desired areas, and influence the composition of national income (Assi
et al.,2019; Vtyurina, 2020; World Bank, 2008). As a way of encouraging investment, redistributing income and ensuring equitable distribution of wealth, most developing and developed nations of the world usually spend judiciously on infrastructural facilities such as good roads (Jhingan, 2011). Expenditure on road and construction can boost trade and facilitate smooth movement of goods and services from one place to another. Good road network encourages investment, reduces unemployment, brings about competition which would help reduce the prices of goods and services, and helps to stimulate economic growth (Rostow, 1959). A good road network can also help to open up more areas for development and increases private sector investment and profitability of firms, thus fostering economic growth. The road and construction as well as transport and communication sectors serve as a means of job creation to millions of Nigeria workforce. They have strong relationships with other sectors of the economy as they lay the foundation for economic growth by providing the needed infrastructural facilities for growth to take place. Good roads tend to reduce the costs of production and save time of movement of goods and services (National Bureau of Statistics [NBS], 2020).

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 (Oladipo et al., 2023). 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 varieties of outfits such as television, radio, mobile phones, internet, and 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, and provision of raw materials etc. 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).

The general view on government spending on infrastructures is that it can enhance sustainable growth if effectively and efficiently utilized. The high level of mismanagement of the resources affects infrastructural development. Nigeria government has continued to intensify efforts to increase spending on infrastructure with a view to gain economic growth in the country in order to ease the hardship of the citizens (Jude et al., 2021). Meanwhile, advanced economies provided efficient transportation, communication, good road, basic healthcare facilities, standard education etc. But, ironically this is not the case in Nigeria. Hence, investment in infrastructures and productive activities is assumed to positively contribute to the growth of the economy whereas spending on consumption by the government retard growth. It is argued that the country will benefit socially and economically from government investment in health, roads, education, communication etc. Nigeria economy is challenged with poor infrastructural facilities, ranging from poor roads networks, poor transport and communication system, lack of educational facilities and healthcare facilities, unstable power supply etc. (Jibir & Aluthge, 2019a). These complex problems affected the economic growth of the nation. The few basic government infrastructures available in the country are depreciated especially with regards to the road networks.

There have been mixed results across the globe on how road and construction as well as transport and communication spending impacts economic growth in Nigeria. Researchers like Amadi and Alolote (2020), Omokaro and Ikpere (2019), and Ekiran and Olasehinde (2019) found that government expenditure on road and construction contributes positively to economic growth while the likes of Charles et al. (2018) and Ogunlana (2017) revealed that government expenditure on road and construction is unfavorable to the growth of any economy. More so, 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 on transport and communication and economic growth in Nigeria. It is against this backdrop that this study attempts to analyze the impact of road and construction as well as transport and communication spending on economic growth in Nigeria. The remaining part of this paper include, empirical literature; materials and method; results and discussion as well as conclusion and recommendation.

EMPIRICAL LITERATURE

Ekiran and Olasehinde (2019) studied the impact of infrastructure spending on economic growth in Nigeria. The study covered the period from 1981 to 2017, using vector autoregressive estimation technique. The result revealed that road and construction expenditure has a positive and significant impact on economic growth in Nigeria.

Mugambi (2016) carried out research on the impact of road infrastructure investment on economic growth in Kenya. The scope of the study covered the period of 35 years, that is, 1980 to 2014 and the method of analysis employed was simple linear regression model. It was however found that both government and private spending on road infrastructure in Kenya have a positive impact on the growth of their economy.

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.

Oladipo et al. (2023) adopted the Autoregressive Distributed Lag (ARDL) Model to analyze the Impact of Road and Construction Capital Expenditure on Economic Growth in Nigeria from 1981 to 2020.The finding reveals that government capital expenditure on road and construction has a negative and statistically insignificant impact on economic growth in Nigeria.

Ogunlana (2017) empirically investigated the impact of government expenditure on economic growth from 1970 to 2015. The study used an Error Correction Model (ECM) and it was found that government capital expenditure on road and construction has a negative impact on economic growth in Nigeria.

Longe and Omozuawo (2012) see spending on road and construction infrastructure as one of the fiscal tools of achieving speedy economic growth and then examine its impact on economic growth in Nigeria between 1980 and 2009. The study employed an Error Correction Model (ECM) as a method of analyzing the impact. From the findings, it was found that expenditure on road and construction in Nigeria has a negative but significant impact on economic growth during the period covered by the study.

Oladipo et al. (2024) 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 (ARDL) Model as the method of analysis and the result reveals that in the long run and short run, government capital expenditure on transport and communication exert positive and significant impact on economic growth in Nigeria.

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.

Oyejide (2013) used panel data for 14 developed countries (1970-1990) and applied a method of OLS. 5-year moving average. The study took various functional types of expenditure (health, education, transport, etc) as explanatory variables and found that health, transport and communication have significant positive effect while education and defense have a negative impact on economic growth.

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.

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 (VECM). The results show that government spending on transport and communication has significant effects on economic growth in Nigeria. Narudeen and Usman (2010) found that government expenditure on transport and communication, and health were found to positively impact on economic growth.

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.

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.

Amadi et al. (2013) examined the effect of public spending on transport infrastructure and economic growth in Nigeria from the period1981 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.

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.

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.

Danlami and Umar (2023) employed Autoregressive Distributed Lag (ARDL) model to evaluate the Impact of Public Expenditure on Infrastructural and Economic Development in Nigeria during the period from 1986 to 2022.The study reported a long run relationship between public expenditure on infrastructural and economic development. The result further shows that Public expenditures on health and construction infrastructures negatively affect economic development in Nigeria while public expenditures on education, transportation and communication, and economic and services infrastructures positively affects economic development in Nigeria.

MATERIALS AND METHODS

In this study, a systematic time series econometrics approach is used to evaluate impact of Road and Construction Spending (RCS) as well as Transport and Communication spending (TCS) as selected Economic Services on Nigeria Economy proxy by Gross Domestic Product (GDP) during the period 1981-2022. The time series data such as GDP, RCS and TCS were sourced from the Central Bank of Nigeria (CBN) Statistical bulletin and National Bureau of Statistics. In order to ensure that the variables are stationary, Augmented Dickey-Fuller (ADF) unit root test was adopted in order to have reliable and unbiased results. The ARDL Bounds test for cointegration test was conducted to test for the long run relationship among the variables. This kind of cointegration test does not require that the variables exert the same order of integration. It can be applied when there are mixed orders of integration in the stationarity tests conducted. Thus, the decision rule for using long run elasticities based ARDL is that the value of the computed F-statistic must be greater than the upper bound. This shows that there is cointegration. On the other hand, the short run ARDL model can be applied if the value of computed F-statistics is lower than the lower bound.

The functional form of this study's model is thus specified as;

$$GDP = F(RCS, TCS) \quad \text{.....(1)}$$

Thus, the functional relationships between endogenous and the exogenous variables in the study are stated as follows:

$$GDP = F(RCS, TCS) + e_t \quad \text{……(2)}$$

The econometric form of the model is written as thus:

$$GDPt = a_0 + a_1 RCSt_{-1} + a_2 TCSt_{-1} + e_t \quad \text{.....(3)}$$

Where:
GDP = Gross Domestic Product (Proxy of Economic Growth)
RCS = Road and Construction Spending
TCS = Transport and Communication Spending
t_{-1} = Lagged value of the variables
a_1, a_2, a_3 = Estimators/Coefficients
a_0 = Constant
e_t = Stochastic error term(It explains other variables that cannot be captured in the model)
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 (SRE)

$$\Delta \ln GDP_t = a_0 + \sum_{i=1}^{k} \alpha_1 \Delta \ln GDP_{t-i} + \sum_{i=1}^{k} \alpha_2 \Delta \ln RCS_{t-1} + \sum_{i=1}^{k} \alpha_3 \Delta \ln TCS_{t-1} + \lambda ecm_{t-1} + e_t \quad \text{‘……. (4)}$$

Where:
ECM = Error Correction Term

Long Run Equation (LRE)

$$\Delta lnGDP_t = a_0 + \sum_{i=1}^{k} \alpha_1 \Delta lnGDP_{t-i} + \sum_{i=1}^{k} \alpha_1 \Delta lnRCS_{t-i} + \sum_{i=1}^{k} \alpha_2 \Delta TCS_{t-1} + \mu_t \ldots\ldots(5)$$

RESULTS PRESENTATION AND DISCUSSION

This part covers the Descriptive statistics, Augmented Dickey Fuller (ADF) unit root test, ARDL Bounds test for cointegration, Error Correction Model and Discussion.

i. 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 below:

Summary of Descriptive Statistics Result

	GDP	RCS	TCS
Mean	41477.63	52.63548	17.18500
Median	9867.970	11.17500	8.935000
Maximum	202365.0	218.4700	90.03000
Minimum	139.3100	0.090000	0.030000
Std. Dev.	55934.02	69.97894	20.84467
Skewness	1.336249	1.117917	1.450108
Kurtosis	3.703000	2.893602	5.107647
Jarque-Bera	13.36380	8.767972	22.49350
Probability	0.201253	0.112476	0.170013
Sum	1742060.	2210.690	721.7700
Sum Sq. Dev.	1.28E+11	200779.1	17814.51
Observations	42	42	42

Source: Authors' Computation, 2025.

Table 1 above contains summary of statistics: the Mean, Median, Maximum, Minimum, Standard Deviation, kurtosis, and Jarque-Bera values for the variables under consideration. The table shows that Gross Domestic Product (GDP) has the highest mean value of 41477.63, while the Transport and Communication Spending (TCS) has the lowest mean value of 17.18500.

GDP has the highest level of discrepancy, as shown in the standard deviation result. This means that GDP was found to be more volatile and unpredictable having the highest standard deviation of 55934.02. TCS shows the lowest level with the standard deviation of 20.84467 respectively.

Skewness is a measure of the rate of asymmetry or discrepancy of the variables. The skewness values for the variables reveal that all the variables are positively skewed.

Kurtosis measures the peakedness and flatness of the series. Thus, the Kurtosis statistics for the variables show that GDP and TCS are leptokurtics relative to their normal distribution because their values of 3.703000 and 5.107647 respectively are greater than three, while RCS is platykurtic because its kurtosis value of 2.893602 is lesser than three.

The Jarque-Bera statistic which determines whether the series are normally distributed or not shows the probability value of 0.201253, 0.112476 and 0.170013 for GDP, RCS and TCS respectively. This indicates that all the variables are normally distributed since their probability values are greater than 5 percent significance level.

ii. Augmented Dickey Fuller (ADF) Unit Root Test

Time series data are prone to spurious regression and usually exhibit unit root, hence, ADF unit root test was employed to test for stationarity. The result is presented in the table 2 below:

Table 2. Summary of ADF Unit Root Test Result

Variables	ADF Statistics	5% Critical Value	Order of integration	Probability
GDP	-3.778932	-3.526609	1(1)	0.0282
RCS	-4.866174	-3.523623	1(0)	0.0436
TCS	-8.475152	-3.526609	1(1)	0.0000

Source: Authors' Computation, 2025.

Non-stationarity data usually exhibit spurious regression which may produce misleading results. In order to avoid this, a stationarity test, using Augmented-Dickey Fuller (ADF) test was employed. The result of the ADF test as presented in Table 2 above shows that the endogenous variable (GDP) and exogenous variable (TCS) are stationary after the first difference, that is, integrated of order one l(1). While another exogenous variable (RCS) is stationary at level. This means RCS is integrated of order zero l(0), all at 5% level of significance. The null hypothesis of the presence of unit root in the series is therefore rejected as indicated by the values of their calculated ADF test statistics, in absolute terms, are greater than their critical values at 5 percent level. Based on this, it is clear that the series are integrated of mixed orders, that is, order one and zero. Thus, the ARDL Bounds test is appropriate to determine the long run relationship among the variables.

iii. Autoregressive Distributed Lag (ARDL) Bound Test Result

The long run dynamic relationship among the variables in the model was tested using the ARDL modelling approach in line with Pesaran and Pesaran (1997) procedure. The test (F-statistics) tested for joint (overall) significance of the co-efficient of all the variables in the model. The decision rule is that if the computed F-statistics exceeds the upper bound value I(1), then the null hypothesis is rejected which indicates that there is co-integration. Otherwise, if computed F-statistics falls below the lower bound value I(0), the null hypothesis of no co-integration is accepted. If the computed result falls between the lower and upper bound values, the test is inconclusive.

Table 3: ARDL Bounds Test for Cointegration

Significance	Lower Bound 1(0)	Upper Bound 1(1)
10%	2.37	3.2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66
Test Statistic	Value	**K**
F-statistic	62.90766	3

Source: Authors' Computation, 2025.

The result of the ARDL test presented in Table 3 above reveals that the value of F-statistics (62.90766) of the test is greater than the lower bound (2.79) and upper bound (3.67) at 5 percent level of significance. Thus, there is a long run relationship among the variables. This leads to the rejection of the null hypothesis which states that there is no long run relationship among the variables of the model. That is, there is cointegration in the model.

iv. ERROR CORRECTION MODEL (ECM)

ECM (ecm_{t-1}) is the short-run dynamic error correction factor which measures the speed of adjustment in the short-run into the long-run.If the coefficient of ecm_{t-1} is negative we then conclude that there exist short-run relationship between the independent variables and dependent variable. As a result, the study analysis will rely on short run results because of the advantages short-run results have over long-run results. Short-run results have the following advantages over long-run results:

i. Short run results give multiplier effect of the independent variables on the dependent variable
ii. Short-run is a convenient model that corrects disequilibrium in short-run into long-run.
iii. Short-run results resolves the problem of spurious regression by taking into account the lag of error correction model (ECM) which eliminates trends from the model.
iv. ECM fits into both general and specific approach to econometric model.
v. The error term in Short-run result is a stationary variable etc (Gujarati. 2004).

Table 4: Error Correction Model Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)*	0.103663	0.028857	3.592262	0.0011
RCS**	3.105314	21.01128	0.147793	0.8834
TCS**	17.17475	27.34578	0.628059	0.5343
C	587.9252	617.9335	0.951438	0.3483
ECM01(-1)**	-0.246861	0.242459	-1.018155	0.3160

Source: Authors' Computation, 2025.

The result in **table 4** above shows that the Error Correction Model (ECM) coefficient is negatively signed and insignificant. This implies that approximately 25% deviation from the long-run equilibrium relationship between GDP and its determinants are corrected every one year. There is therefore empirical evidence that there exist a long-run relationship between GDP and exogenous variables (RCS and TCS).

vi. Discussion

The result in **table 4** above revealed that the coefficient of the lagged value of Gross Domestic Product (GDP(-1)) is approximately 0.103663 and the p value (Probability) is 0.0011. The implication is that a percent increase in the value of GDP of the previous year will increase the current value of GDP by 0.1 per cent. The result further finds that Road and Construction Spending (RCS) as well as Transport and Communication Spending (TCS) have positive and insignificant impact on GDP. This meets the a priori expectations that a percentage increase in RCS and TCS will lead to an approximately 3.105314 and 17.17475 percentage increases in GDP respectively. These results conform the findings of Mugambi (2016), Omokaro and Ikpere (2019) and Danlami and Umar (2023).

CONCLUSION AND RECOMMENDATION

This study focused on the econometric analysis of the impact of Road and Construction Spending (RCS) as well as Transport and Communication spending (TCS) as selected Economic Services Spending on Nigeria Economy proxy by Gross Domestic Product (GDP) during the period 1981-2022. The Autoregressive Distributed Lag (ARDL) Model was adopted based on the mixed order of integration that the study exhibits. The result from the study reveals that Road and Construction Spending (RCS) as well as Transport and Communication Spending (TCS) have insignificant positive impact on GDP. Therefore, the study recommends that more still need to be done by all ties of government to improve road and communication networks that will enhance sustainable economic growth in Nigeria.

REFRESNCES

Amadi, K.C., & Alolote, I.A. (2020). Government expenditure on infrastructure as a driver for economic growth in Nigeria. *Journal of International Business Research and Marketing, 5*(2), pp. 20-26.

Amadi, C., Amadi, N.N., Nyenke, C.U. (2013). Public spending on transport infrastructure and economic growth in Nigeria, 1981-2010. *Journal of Sociological Research, 4*(2), pp. 438-446.

Assi, R., Dimson, J. Goodman, A. & Andersen, J. S. (2019). Spending Reviews: A more Powerful Approach to ensuring value in Public Finances. Public and Social Sector Insights, London: McKinsey & Company.

Babatunde, S.A. (2018). Government Spending on Infrastructures and Economic Growth in Nigeria. *Economic Research-Ekonomska Istrazivanja, 3*(1), pp. 997-1014.

Barilee, B.N., & Benvolio, J. (2021). Government Expenditure on Transportation and Economic Development in Nigeria. *World Bulletin of Management and Law, 5*, pp. 120-134.

Central Bank of Nigeria (2022).Central Bank of Nigeria Statistical Bulletin. https://www.cbn.gov.ng.

Central Bank of Nigeria (2019). Central Bank of Nigeria Statistical Bulletin. https://www.cbn.gov.ng.

Central Bank of Nigeria (2017). Economic report fourth quarter. https://www.cbn.gov.ng.

Charles, D., Onuchuku, O., & Tamuno, S.O. (2018). Government expenditure on construction,transportation and communication on economic growth in Nigeria. *International Journal of Scientific Research, 3*(2), pp. 39-47.

Danlami, V. & Umar, Y. S. (2023). The Impact of Public Expenditure on Infrastructural and Economic Development in Nigeria (1986-2022). *Gusau Journal of Economics and Development Studies (GUJEDS), 4*(1), pp.125-139.

Ebiringa, O.T., & Charles-Anyaogu, N.B. (2012). Impact of Government Sectoral Expenditure on the Economic Growth of Nigeria. *International Journal of Economic Research, 3*(6), pp. 82-92.

Ekiran, J.O., & Olasehinde, I.O. (2019). Infrastructural development and economic growth in Nigeria. *Journal of Economics and Sustainable Development, 10*(24), pp. 67-73.

George-Anokwuru, C.C. (2023). The Effect of Transport and Communications Expenditure on Economic Growth in Nigeria. *International Journal of Economics, Commerce and Management, 11*(6), pp. 262-279.

Gujarati, D. N. (2004). Basic Econometrics. 4th Edition, McGraw-Hill Companies.

Jhinghan, M.L. (2011). The Economics of Development and Planning. Vrinda Publications Limited.

Jibir, A., & Aluthge, C. (2019a). Modelling the Determinants of Government Expenditure in Nigeria. *Cogent Economics & Finance,7*(1), 10.1080/23322039.2019.1620154.

Jude, I., Richard, C. O., Adamu, J., & Aisha, A.H. (2021). Impact of Government Infrastructural Expenditure on Economic Growth: Evidence from Nigeria. *International Journal of Economics and Development Policy (IJEDP), 4* (1), pp. 26 –39.

Longe, J.B., & Omozuawo, M.B. (2012). The Impact of Government Spending on Road Infrastructure in Nigeria (1980-2009). *The Intuition*, 1-12.

Mugambi, A.M. (2016). Roads Infrastructure Investment and Economic Growth in Kenya: The Role of Private and Public Sectors. A Masters Thesis submitted to the School of Economics, University of Nairobi, Kenya.

Mustapha, Y., Sunday, E., & Muhammad, U. (2018). Impact of Government Expenditure on Transportation Sector and Economic Growth in Nigeria (1980-2016). *Bingham Journal of Economics and Allied Studies, 1*(2), pp. 1-12.

Narayan, P.G. (2021). Public Expenditure in Nepal: A Case of Transportation Sector. *Journal of Management and Development Studies, 30*(1), pp. 24-36.

National Bureau of Statistics (2020). Nigerian Gross Domestic Product Report-Q4 & full year 2019.www.nigerianstat.gov.ng.

National Bureau of Statistics (2017). Annual Abstract of Statistics, www.nigerianstat.gov.ng.

Narudeen, A., & Usman, A. (2010). Government Expenditure and Economic Growth in Nigeria , 1980-2007: Disaggregated Analysis. *Business and Economics Journal,* Volume 2010: BEJ-4.

Ogunlana, O.F. (2017). An empirical exposition of government spending on economic growth in Nigeria. *Arabian Journal of Business and Management Review (Nigerian Chapter), 4*(4), pp. 41-51.

Oladipo, A. O., Saheed, Z. S., Egwaikhide, C. I., & Alexander, A. A. (2024). Impact of Transport and Communication Capital Expenditure on Economic Growth in Nigeria, 1986-2022. *African Journal of Social Sciences and Humanities Research, 7*(1), 38-54. DOI: 10.52589/AJSSHR-STD9XN1J.

Oladipo, A.O., Nkamnebe, O.E., Nwokocha, A.F., Saheed, Z.S., Egwaikhide, C.I., & Alexander, A.A. (2023). Empirical Analysis of the Impact of Road and Construction Capital Expenditure on Economic Growth: Evidence from Nigeria. *African Journal of Economics and Sustainable Development 6*(2), 106-120. DOI: 10.52589/AJESD-SOJWOI4C.

Omokaro, B.E., & Ikpere, O.C. (2019). The Role of Public Spending on Construction, Transport and Communication on Economic Growth in Nigeria. *International Journal of Research andScientific Innovation, 6*(4), pp. 293-295.

Oyejide, T. (2013). The Challenges of Monetary Management in an Environment of Fiscal Dominance, Third Annual Monetary Policy Conference Proceedings on Issues in Fiscal Management: Implications for Monetary Policy in Nigeria. *Central Bank of Nigeria ublications*, 11-12.

Pesaran, M.H., Shin, Y., & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), pp. 289-326.

Pesaran, M. H., & Pesaran, B. (1997). Microfit 4.0. Interactive Econometrics Analysis. Oxford University Press.

Razi, B. (2020). Transport and Communication: Definition and Importance/Advantages. www.jotscroll.com.

Rostow, W.W. (1959). The stages of economic growth. *The Economic Review, New Series, 12*(1), pp.1-16.

Vtyurina, S. (2020). Effectiveness and equity in social spending: the case of Spain. *IMFWorking Paper*, No. WP/20/16.

World Bank (2008). Public Expenditure Management Handbook. Washington, D.C.: The World Bank Group.