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Road And Construction Capital Expenditure's Impact on Economic Growth of Nigeria

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Abstract

The importance of road and construction sector as an integral part of any economy cannot be overemphasized. However, the challenges of road and construction sector are not only limited to bad and dilapidated roads, but also lack of adequate funding to provide better infrastructure, corruption, poor quality control and construction projects taking longer than planned. Therefore, this study investigates how capital investments in roads and construction affect economic growth in Nigeria. The study used the Autoregressive Distributed Lag Model (ARDL) to evaluate the annual time series data obtained from the National Bureau of Statistics (NBS) and Central Bank of Nigeria Statistical Bulletin (CBN). The analysis encompassed the years 1981 to 2020. The statistics for capital spending on roads and construction came from the NBS, whereas the data for the GDP, government revenue, inflation, and commercial bank credit to the construction sector came from the CBN Statistical Bulletin. According to the findings, government capital spending on roads and construction, commercial bank credit to the construction sector, and government revenue all contribute to Nigeria's economic growth. The outcome also demonstrates that the inflation rate impacts Nigeria's economic growth negatively yet statistically significantly. Accordingly, the report suggests that in order to promote economic growth, the government should make sure that funding for this sector is raised and well supervised. By lowering the bank rate, the government should also encourage commercial banks to extend more loans for the construction of infrastructure.

Keywords: Road, Construction, Economic Growth, Nigeria, ARDL.

Introduction

The relationship between government capital spending on road and construction has been widely debated amongst scholars. Some are of the opinion that increased government capital expenditure on this sector can enhance economic growth through the various investments that would be encouraged, while some are not in support. Theoretical propositions by Rostow (1959), Keynes (1936), Musgrave (1959) amongst others support the argument that any country's and development depend on capital expenditure. Road and construction capital expenditure can help provide good road construction, bridges, canals, culverts and flyovers. Road construction provides strong connections with various sectors in the economy. It is a foundation through which other sectors of the economy can grow, because without good roads, movement of people as well as goods and services from one location to the other cannot be possible (National Bureau of Statistics [NBS], 2020).

The economic effect of good road investment will reduce the travel hours meant to be covered in transporting raw materials, both finished goods and people, thereby, reducing the cost of transportation. Therefore, it makes movements cheaper, faster and safer for both individuals and businesses (Welsh Assembly Government [WAG], 2010). The effect of reduction in the cost of transportation on businesses will therefore reduce the cost of production. When this is achieved, businesses will be able to produce more at cheaper prices and this tends to contribute to economic growth of a nation. Thus, reducing the cost of production is the mechanism through which investments in road and construction through public expenditure can increase economic growth (WAG, 2010).

Globally, government capital expenditure, especially in the road construction sector is seen as a growth-inducing catalyst in both advanced and some developing economies. Owing to the importance of good and adequate road construction in contributing to economic growth, the Government of United Kingdom always face the pressure from both local and sector bodies to ensure that government spending on road projects is increased. The belief is that these roads projects provide national economic development (WAG, 2010). According to the report made by World Economic Outlook [WEO], 2014], every dollar

spent on capital projects brings economic benefits of 5 to 25 percent. This will help stimulate growth and development across all sectors of the economy.

The theoretical proposition by Musgrave (1959) which asserts that economic efficiency would be achieved if revenue generated by the government is efficiently allocated and utilized does not seems to hold in Nigeria. This is because Nigeria still indulges in mismanagement and/or diversion of public funds, and has resulted in provision of substandard roads and construction, road projects taking longer than the agreed time and abandonment of some roads' projects by contactors. Inadequate capital funding in construction sector to provide better infrastructure, corruption, poor quality control are some of the problems of this sector. Available statistics show that budget allocation to road and construction sub-sector was recorded as NGN26598.7 million in 1998 and NGN126.9 billion in 2008 (Central Bank of Nigeria [CBN], 2021). Also in 2011 and 2020, it was recorded as NGN150.7 billion and NGN315.56 billion respectively. This figure is low compared to what other developed and some developing economies allocate to this sector (CBN, 2021).

The commercial banks' credit to construction sector is seen as one of the means of financing capital projects. However, the meagre and inconsistencies in the amount of credits made available to the construction sector resulted to the sector's inability to enhance economic growth since government usually runs deficit budget over the years due to the shortfall of revenue over expenditure. The evidence from the Central Bank Statistical Bulletin (2021) shows that bank credit to the sector was NGN1.75 billion in 1981 and NGN5.41 billion in 1993. However, in 2015 and 2020, commercial banks gave NGN531.74 and NGN965.19 billion credits to constructor sector respectively (CBN, 2021).

The amount of revenue the government generates is also a major factor in determining how much is spent on capital projects. This helps to determine whether or not to increase capital expenditure on road and construction subsector (PricewaterCooper [PwC], 2014). The Nigeria government revenue in 2010 and 2020 were NGN7303.7 billion and NGN9276.1 billion respectively (CBN, 2021). Statistics have shown that in 2021 83.2 percent of the revenue was used to service debt (CBN, 2021). With this percentage used in

servicing debt, increased government capital expenditure on some critical sector like road and construction is likely not to be possible. The effect of increase in inflation rate on government capital expenditure cannot also be neglected as it increases the cost of providing good roads, thereby reducing the number of roads that can be provided when inflation is reduced. This has serious implications on economic growth as increased travel hours due to bad, inadequate and dilapidated roads result to increase in transportation costs of raw materials, finished goods as well as people, thereby making businesses to cut down on production (NBS, 2020).

In an effort to bolster the economic growth through capital expenditure on road and construction sector, the government implemented the National Transport Policy of 2010, Belt and Road Initiatives of 2018. Despite all these efforts made by the government, the problems of this sector still persist (Africa Development Bank Group [AFDB], 2020). Given this, the main purpose of this study is to investigate if capital investments in roads and construction affect Nigeria's economic growth.

The study makes a valuable contribution to existing literature by incorporating government revenue as a control variable, an aspect that has not been explored in research on the relationship between Nigeria's road and construction capital expenditure and the country's economic growth in Nigeria. This variable is included owing to its importance in determining how government expenditure is prioritized. Consequently, the inclusion of this variable is anticipated to bolster the robustness and credibility of this study's findings.

The remaining sections of this article are structured into four different sections. Section two reflects the review of literature, and Section three presents the data and methodology used for the study. In part four, the study's findings are presented, and in section five, the study's conclusion and suggestions are covered.

Literature Review

Theoretical Literature

Musgrave Theory of Public Expenditure

Richard Abel Musgrave developed the Musgrave's theory of public spending. In his 1959 book "The Theory of Public Finance," Musgrave makes the assumption that public spending serves three distinct purposes. These tasks include distributing revenue, allocating public goods, and stabilizing the economy. The criticisms of his earlier works were the inspiration for this book. The challenge of achieving full employment was the focus of the first branch on economic stabilization. According to Musgrave, the overall magnitude of employment and prices in the economy is determined by the aggregate demand in respect to the potential output which is valued at current prices. The second branch deals with the distribution of resources. Musgrave believes that the type of public goods that is supported impact on people. Furthermore, Musgrave (1959) stated that income redistribution is necessary to promote economic efficiency and equality. Above all, Musgrave argues that the effectiveness and efficiency of government funding would guarantee economic growth and progress.

The weakness of this theory is basically on the distribution of income argued by Musgrave. Musgrave emphasized that budget distribution should respect equity. However, he failed to realize that some sectors are more paramount and have the potentials of putting the economy on the path of development than some. For instance, Nigeria as a nation is experiencing bad, dilapidated and insufficient road networks amongst others. This requires allocating more to the sector to help provide good and adequate road networks owing to the importance of this sector in opening more areas for development. Thus, the idea of equity in budget redistribution cannot stand. On the aspect of allocation of resources, Musgrave failed to recognize the fact that provision of good roads can influence individuals and businesses to develop their social environment, thereby contributing to the nation's economic growth.

The relevance of the theory to this study is based on Musgrave's emphasis on efficiency on the implementation of public spending in promoting growth. As it is in Nigeria, the problem of inefficient implementation of public funds needs to be tackled in order to restore growth in the economy.

Empirical Literature

This section discusses the empirical literature that is most pertinent to this topic.

Onoja et al. (2023) investigate the nexus between the capital aspect of government spending and Nigeria economic growth. The study examines the years 2012 through 2021 and use OLS as an estimating method. Government capital expenditure on roads and education was found to have a positive and considerable impact on economic growth. In Tanzania between 1990 and 2020, Tillya and Cairo (2022) looked at the effects of public spending on road development on economic growth. To evaluate the impact, the study used descriptive and inferential statistics. According to the findings, government spending on constructing new roads has a marginally positive effect on economic growth, whereas the inflation rate has a negligible but insignificant impact. The study further revealed that Tanzania's economic growth is positively and significantly impacted by government spending.

The government infrastructure spending and its impact on economic growth in Nigeria was examined by Amadi and Alolote (2020) between 1981 and 2017, employing the weighted least square approach. The findings indicated that public investment on infrastructure and building, transportation and communications, as well as education and health, have a major impact on Nigeria's economic growth. Praise (2020) used an error correction method of analysis to analyze the effects of sectoral bank loans allocation of on economic growth in Nigeria from 1985 to 2019. The results show that bank credit to construction is beneficial to Nigeria’s economic growth. Praise's (2020) empirical work was reviewed because one of the variables of interest is commercial banks' credit.

The effects of developing road infrastructure on economic growth were examined by Ng et al. (2019) in 60 different nations. The study spans the years 1980 to 2010. Fixed effect panel regression was used as the analysis technique. According to the findings, the countries' economies are growing as a result of increased road length per thousand people, per capita export, per capita education spending, and physical stock of capital per worker. Omokaro and Ikpere (2019) used the multiple regression technique to analyze empirically how government expenditure affects on Nigeria’s economic growth between 1989 and

2013. The study's findings indicate that while spending on transportation and communication is beneficial but small for Nigerian economic growth, spending on roads and construction has a positive and significant influence.

Empirical research was conducted by Ekiran and Olasehinde (2019) on the effect of infrastructure spending on economic growth in Nigeria. The study included the years 1981 to 2017, and the model's parameters were estimated using the vector autoregressive estimation technique. The results revealed that Nigeria's economic growth is positively and significantly impacted by road and construction spending. In a study by Agbanike et al. (2018), the effect of bank lending on economic growth in Nigeria between 1981 and 2014 was examined using the apparently unrelated regression (SUR) technique of analysis. However, the study found that the impact of bank lending on Nigeria's economic growth is negative and insignificant.

The impact of government spending on transportation, communication, and road development in Nigeria from 1980 to 2016 was estimated by Charles et al. (2018) using Engle-Granger co-integration and the Error Correction Mechanism. According to the study's findings, Nigeria's economic growth is negatively and insignificantly impacted by spending on transportation and communication as well as road infrastructure construction. In Nigeria between 1970 and 2011, Isiaka and Abiodun (2018) looked at the impact of government revenue on Nigeria economic growth. The study used the Granger causality test in addition to the error correction method. The findings show that government spending increases economic growth in Nigeria. The study of Isiaka and Abiodun (2018) was reviewed in this study because it is one of the control variables used in this study.

The relationship between investments in road infrastructure and economic growth in South Africa between 1960 and 2013 was examined by Moeketsi (2017) in his Master of Science dissertation using a vector autoregressive model. The outcome demonstrates a favorable relationship between investment in South Africa's road infrastructure, ICT investment, and labor input. The effect of public spending on economic growth from 1970 to 2015 was empirically examined by Ogunlana (2017). An error correction technique was

employed, and it was shown that Nigeria's government capital expenditure on road and construction has a detrimental effect on the country's economic growth.

Mugambi (2016) conducted a study to see the effect of road infrastructure investment on Kenyan economic growth. The study's scope included 35 years, from 1980 to 2014, and the type of analysis used was a basic linear regression model. It was discovered, however, that both government and private spending on road infrastructure in Kenya has a direct relationship with the country's economic growth. As a technique of analyzing the impact, the study used an error correction model. According to the data, road and construction spending in Nigeria has an inverse but significant relationship with economic development during the studied period. Ibrahim (2010) used a two-step efficient generalized technique of moments estimator to investigate the impact of road sector expansion on economic growth in Ethiopia from 1971 to 2009. The regression results demonstrate that Ethiopia's overall road network has a considerable impact on growth.

Methodology

Model Specification

The model used in this study is specified in accordance with the model of Tillya and Cairo (2022). A slight modification was done to investigate the relationship between road and construction capital expenditure and Nigeria's economic growth. Tillya and Cairo (2022) included in their model, gross domestic product, government expenditure on road construction, inflation rate, and government spending, foreign direct investment, industrial value added and manufacturing value added. The model is thus functionally specified as;

GDP = f(ERC, GVS, MVA, IVA, FDI, INF) (1)

Where, GDP = Gross Domestic Product, ERC = Government Expenditure on Road and Construction Capital, GVS = Government Spending, MVA = Manufacturing Value Added, IVA = Industrial Value Added, FDI = Foreign Direct Investment, INF = Inflation Rate.

The model of this study therefore modified the model of Tillya and Cairo (2022) to include government capital expenditure on road and construction, commercial bank credit to construction sector, inflation rate and government revenue. Some of the variables in the

model of Tillya and Cairo (2022) because this study focuses on road and construction capital expenditure and thus, inflation and government revenue are included as control variables. The functional form of this study's model is thus specified as;

GDP = f(RCEX, CBCC, GOVR, INFR) (2)

The econometric form of the model is written as;

$GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 RCEX_{t-1} + \beta_3 CBCC_{t-1} + \beta_4 GOVR_{t-1} + \beta_5 INFR_{t-1} + \mu_t$ (3)

Where, GDP stands for Real Gross Domestic Product and it is used as a proxy for economic growth; RCEX depicts Road and Construction capital spending, CBCC is Commercial Banks' Credit to Construction sector; GOVR is Government Revenue; INFR is Inflation Rate, μ is the stochastic error term; β_0, β_1, β_2, β_3, β_4, β_5, are the coefficients' slopes.

In this study, the short run ARDL model is presented as:

ARDL Equation

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^{p} \alpha 1 i GDPt-1 + \sum_{i=1}^{p} \alpha 2 i RCEXt-1 + \sum_{i=1}^{p} \alpha 3 i CBCCt-1 + \sum_{i=1}^{p} \alpha 4 i GOVRt-1 + \sum_{i=1}^{p} \alpha 5 i INFRt-1 \sum_{i=1}^{p} \alpha 1 i \Delta lnGDPt-1 + \sum_{i=1}^{p} \alpha 2 i \Delta lnRCEXt-1 + \sum_{i=1}^{p} \alpha 3 i \Delta lnCBCCt-1 + \sum_{i=1}^{p} \alpha 4 i \Delta lnGOVRt-1 + \sum_{i=1}^{p} \alpha 5 i \Delta lnINFRt-1 - \emptyset ECM_{t-1} + \mu_t$$

Data Source

The paper evaluates the impact of road and construction capital spending on Nigeria's economic growth from 1981 to 2020, using data from the Central Bank of Nigeria Statistical Bulletin and the National Bureau of Statistics (NBS). The variables of interest include GDP, government capital expenditure on roads and construction (RCEX), commercial bank lending to the construction industry (CBCC), government revenues (GOVR), and the inflation rate (INFR).

Techniques of Estimation

In order to assess the effect of government capital spending on roads and construction on

economic growth in Nigeria, this study used Autoregressive Distributed Lag (ARDL). The ARDL Bounds test was carried out to determine the long-run relationship. The reason ARDL was selected is that it supports mixed order of integration, or I(1) and I(0). Without sacrificing the long-term information, it can also integrate short-term modifications with long-term equilibrium (Pesaran et al., 2001). ARDL is effective even with small sample sizes.

Data Analysis and Discussion of Findings

Descriptive Statistics

Table 1: Summary of Descriptive Statistics

	GDP	RCEX	CBCC	GOVR	INFR
Mean	4.479698	0.920351	1.058721	2.871197	9.000254
Median	4.388548	0.884808	0.457108	3.259333	12.72000
Maximum	4.853624	2.173769	2.984613	4.045980	72.84000
Minimum	4.139226	-0.545765	0.000000	1.021189	5.390000
Std. Dev.	0.252263	0.930549	1.239414	0.078141	0.686964
Skewness	0.253539	-0.131480	0.668893	-0.524823	1.823522
Kurtosis	1.525662	1.486207	1.561878	1.784639	5.158846
Jarque-Bera	4.051335	3.934527	6.429774	4.298097	29.93591
Probability	0.131906	0.139839	0.040160	0.116595	0.000021
Sum	179.1879	36.81402	42.34885	114.8479	760.0100
Sum Sq. Dev.	2.481836	33.77091	59.90972	45.33312	11098.81
Observations	40	40	40	40	40

Source: E-views 10 Output

Table 1 shows the detailed result of the descriptive statistic of the variables. The table shows that inflation rate (INFR) has the highest mean value of 9.0002, next to Gross Domestic Product (GDP) with the mean value of 4.4797. The result also shows that road and construction capital expenditure (RCEX) has the lowest mean value of 0.9204. The standard deviations of these variables show the values of 0.2523 for GDP, 09305 for RCEX, 1.2394 for commercial banks' credits to construction sector (CBCC), 0.0781 for government revenue (GOVR) and 0.6869 for inflation rate. This implies that the estimated values for all

the variables are as close as possible to their true values, meaning that the error that is due to the estimate is statistically negligible. In order words, the estimated results are reliable. The Jarque-Bera statistic which determines if the series are normally distributed or not shows the probability value of 0.1319 for GDP, 0.0402 for CBCC, 0.1398 for RCEX, 0.1166 for GOVR and 0.0000 for INFR. This indicates that GDP, RCEX and GOVR are normally distributed since their probability values are greater than 5 percent significant level, while CBCC and INFR are not normally distributed. The decision rule is that, for a null hypothesis to be accepted, the probability value for Jarque-Bera must be greater than 5 percent, if otherwise, the null hypothesis must be rejected.

Test of Stationarity

Table 2: Summary of the ADF Unit Root Test

Variables	ADF @Level	Critical Value @5%	ADF@ Ist Diff.	Critical Value @5%	Order of Integration
GDP	-0.41491	-2.94115	-3.32705	-2.94115	I(1)
RCEX	-0.70291	-2.94115	-8.85370	-2.94343	I(1)
CBCC	-0.66861	-2.93899	-5.75284	-2.94115	I(1)
GOVR	-1.42927	-2.93899	-6.19497	-2.94115	I(1)
INFR	-3.57007	-2.94115	-6.46503	-6.46503	I(0)

Source: E-views 10 Output.

Augmented-Dickey Fuller (ADF) was used to prevent performing a bogus regression because non-stationary data frequently displays spurious regression, which can lead to misleading conclusions. Thus, Table 2 presents the ADF test's outcome. Inflation Rate (INFR) is integrated of order one, that is stationary at level, while the Gross Domestic Product (GDP), Road and Construction Expenditure (RCEX), Commercial Banks Credit to

Construction Sector (CBCC), and Government Revenue (GOVR) exhibit stationarity at first difference. This indicates that INFR is integrated at order l(0). Since the values of the estimated ADF statistics, in absolute terms, are bigger than their critical values, the null hypothesis that unit root exists in the series is hence rejected.

Lag Length Selection

Table 3: VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: GDP RCEX CBCC GOVR INFR
Exogenous variables: C
Date: 07/26/23 Time: 07:36
Sample: 1981 2020
Included observations: 37

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-197.6534	NA	0.039357	10.95424	11.17193	11.03098
1	-24.80504	289.6377*	1.35e-05*	2.962434*	4.268584*	3.422913*
2	-0.997712	33.45894	1.56e-05	3.026903	5.421511	3.871115
3	17.18578	20.64072	2.78e-05	3.395363	6.878429	4.623307

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

From the result presented in Table 3, the appropriate lag length for this model is one, since all criteria for selecting optimum lag length choose one as the lag length. Thus, Akaike information criterion was used in this study.

ARDL Bounds Test

Table 4: ARDL Bounds Test Result

ARDL Bounds Test
Date: 07/26/23 Time: 07:41

Sample: 1982 2020
Included observations: 39
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.019416	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	3.23	4.35
2.5%	3.25	4.49
1%	3.74	5.06

Source: Eviews 10. Output

The ARDL test result shown in Table 4 demonstrates that F-statistics (5.019) exceed both the lower bound (3.23) and upper bound (4.35) at 5% level of significance. Therefore, there is a long-run relationship amongst the variables. As a result, the null hypothesis is rejected.

Autoregressive Distributed Lag (ARDL) Model

Table 5: ARDL Result

Dependent Variable: D(GDP)
Method: Least Squares
Date: 07/26/23 Time: 07:45
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Long Run ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.445402	0.226692	1.964788	0.0579
GDP(-1)	0.887014	0.056598	15.67222	0.0000
RCEX(-1)	0.002702	4.446452	6.077204	0.0001
CBCC(-1)	0.003941	0.010567	0.372952	0.7116
GOVR(-1)	0.024508	0.010835	2.261939	0.0304
INFR(-1)	-0.023685	0.268859	-3.881057	0.0006

Short Run ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
--				
C	-0.001074	0.004693	-0.228888	0.8205
D(GDP(-1))	1.014804	0.226682	4.476769	0.0001
D(RCEX(-1))	0.026730	0.007346	3.638749	0.0013
D(CBCC(-1))	0.003576	0.005470	0.653702	0.5181
D(GOVR(-1))	0.013939	0.016401	0.849848	0.4019
D(INFR(-1))	-0.000367	0.000164	-2.239923	0.0324
ECM(-1)	-0.609829	0.272418	-2.238582	0.0325

R-squared	0.791236	Mean dependent var	0.017747
Adjusted R-squared	0.592765	S.D. dependent var	0.017798
S.E. of regression	0.013869	Akaike info criterion	-5.553441
Sum squared resid	0.005963	Schwarz criterion	-5.251780
Log likelihood	112.5154	Hannan-Quinn criter.	-5.446112
F-statistic	11.98866	Durbin-Watson stat	2.019777
Prob(F-statistic)	0.001115		

Source: Eviews 10 Output

According to Table 5, the long-run ARDL findings indicate that the lagged value of the gross domestic product (GDP) has a positive and significant influence on the GDP's current value. The result is 0.887, which means that if GDP were to expand by 1% in the prior year, it would likely increase by 0.89 % in the current year as well. Road and construction capital expenditure (RCEX) has a coefficient of the lagged value of 0.0027 and a p value of 0.0001. Accordingly, 1% increase in RCEX will raise GDP by 0.003%. A 5% level of significance indicates that the variable is statistically significant as well. The outcome also demonstrates that the government's revenue (GOVR) and commercial banks' loans to the construction sector (CBCC) have favorable relationships with GDP. The coefficients have values of 0.0039 and 0.025, indicating that a 1% rise in CCBC and GOVR will raise GDP by 0.0039 and 0.025 percent respectively. However, the coefficient value of inflation rate (INFR) displays a negative value of -0.0237. According to this, a long-term 1% increase in INFR will result in a 0.024% decline in GDP. But the value is statistically significant.

Table 5 reveals that the coefficient of the lagged value of GDP (-1) has a positive value of 1.0148 and a p value of 0.0001. This means that a 1% rise in the past value of GDP will result in a 1.015% increase in the current value of GDP. The consequence is that previous year's actions influence current year's activities, increasing output growth. This is to be expected and adheres to the presumption.

The coefficient value of the road and construction expenditure (RCEX) stands at 0.0267, with a p-value of 0.0013. This means that a 1% rise in RCEX will improve the gross domestic output by 0.0267% on average. The variable is also statistically significant in relation to GDP, owing to the p value which is less than the 5% level of significance. The positive link implies that government spending on roads and construction contributes to economic growth during the research period. The study's findings are consistent with a priori expectation since it is predicted that any kobo spent on roads and construction will convert into economic growth through other investments that will be encouraged. This conclusion contradicts the findings of Charles et al. (2018) and Ogunlana (2017), who

found that road and construction expenditures are negative and statistically unimportant to Nigeria's economic growth. It does, however, support Tillya and Cairo (2022)'s findings.

The lagged value of commercial banks' credits to the construction sector is 0.00358 with a p value of 0.5181. Based on the p value, this link is positive but statistically insignificant at the 5% level of significance. According to the findings, a 1% increase in commercial bank credit to the construction sector will enhance GDP by 0.0036 percent in the short run. The positive impact is envisaged because when banks lend to a specific sector, cautious spending is necessary to meet the targeted goals while also fostering economic growth. The finding supports the findings of Oyebowale (2019) and Praise (2020), who discovered a favorable association between commercial bank lending to construction and economic growth in their research area.

Furthermore, the p value for the coefficient of the lagged value of government revenue is 0.4019 and it has a positive value of 0.01394. The variable's positive value suggests that, on average, a 1%rise in government revenue will raise gross domestic product by 0.014% in the short run. The variable is statistically insignificant at the 5% level. This result confirms the findings of Isiaka & Abiodun (2018) and is consistent with the a priori expectation. The inflation rate coefficient's lagged value is -0.00037, and its p value is 0.0324. According to research, a 1% increase in inflation will result in a 0.0004% drop in GDP. The p value, which is less than 5%, indicates, according to the findings, that the variable is statistically significant. The inflation finding is consistent with that of Tillya and Cairo (2022), who conducted their research in Tanzania.

Additionally, since p value of 0.0325 is lower than 5%, the value of the error-correcting component, at -0.6098, exhibits the predicted sign and is statistically significant. This suggests that any unbalance from prior years will be remedied at a pace of about 61% in the current year. The R^2 of 0.7912 indicates that government capital expenditure on roads, construction, and commercial banks' credits to the construction sector, government revenue, and inflation rate account for 79% of the variation in the gross domestic product. The variables are jointly statistically significant at the 5% level of significance, according to the F-statistics of 11.9887. The variables are statistically significant, as shown by the

prob(F-stat) of 0.00112, which is significant. A value of 2.019 on the Durbin-Watson test shows that the model is autocorrelation-free.

Post Estimation Diagnostic Tests

Table 6: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.839426	Prob. F(4,33)	0.5101
Obs*R-squared	3.509373	Prob. Chi-Square(4)	0.4765
Scaled explained SS	12.00627	Prob. Chi-Square(4)	0.0173

Source: Eviews 10 Output

The Breusch-Pagan-Godfrey heteroscedasticity test result is shown in Table 6, and it shows that the probability value of F-statistic is greater than the 5% level of significance. This implies that this model's mean and variance are both constant throughout time. Therefore, it is determined that the null hypothesis is true and that the model does not contain heteroscedasticity.

Table 7: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.448290	Prob. F(2,29)	0.6431
Obs*R-squared	1.139596	Prob. Chi-Square(2)	0.5656

Source: Eviews 10. Output

Since the probability value of the F- statistic is larger than 5%, the Breusch-Godfrey Serial Correlation LM Test results likewise show that there is no serial correlation in the model. Therefore, the null hypothesis is accepted.

Conclusion and Recommendations

The study looks at the impact of capital investments in roads and construction on economic growth in Nigeria over a 40-year period, from 1981 to 2020. Based on the fact that the stationarity test exhibits mixed order of integration, Autoregressive distributed lag was

used. According to the study's findings, INFR has long-term negative effects on economic growth in Nigeria, whereas RECX, CBCC, and INFR have beneficial effects. While other factors (RCEX, GOVR, and INFR) are statistically significant, only CBCC is statistically insignificant. The findings also show that government capital spending on road and construction has a favorable and considerable short-term influence on Nigeria's economic growth. The study also shows that government income and commercial bank lending to the building industry have short-term favorable, but negligible effects on economic growth. This demonstrates that the credit given by commercial banks to the construction industry in the short term is capable of supplying the essential facilities that might boost production development, such as good and accessible highways among others. Furthermore, it suggests that government funding for the road and construction industries will aid in attracting investments. However, Nigeria's economic growth is being negatively but significantly impacted by the inflation rate. According to these results, the study suggests the following.

i. Government should make sure that allocations to this sector are increased, effectively monitored, and sparingly used in order to enhance the output growth of the Nigerian economy since government capital expenditure on roads and construction both in the long and short run, has a positive impact on economic growth. Government should make sure that the money paid by car owners to obtain a driver's license is only directed to road construction in order to achieve the rise in government capital expenditure on roads and construction. This would go a long way toward assisting the government in building more highways that would ensure simple linkages and the circulation of goods and services.

ii. The impact of commercial banks' credit on Nigeria's output growth was determined to be favorable but statistically negligible. Hence, commercial banks should give more loans to construction sector at a reduced rate. This would help to provide more and durable roads. Additionally, it is advised that the money be used wisely in order to record a stimulating effect on economic growth in the long run.

iii. The government should make sure that administrative expenses are reduced in all government parastatals, in order to boost revenue. As a result, the government would be able to spend more money on important areas like development and roads.

iv. Since the high cost of production which results from the price of imported raw materials for industrial production is the root of the inflation we are currently experiencing; the government should give priority to the industrial and agricultural sectors of the economy. Additionally, certain farm inputs are imported commodities. All of these have a significant impact on Nigeria's prices for goods and services.

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