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DOES INFRASTRUCTURAL DEVELOPMENT PROMOTES ECONOMIC GROWTH IN NIGERIA?

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Abstract

Over 40 years, this research studied the influence of infrastructure development on Nigeria's economic growth (1981-2019). The World Bank's World Development Indicators provided the annual time series. An infrastructure-modeling Cobb-Douglas production function is given. To test for stationarity, long-run connection, causal link, and short and long-run equilibrium, the research utilized the unit root test, Johansen co-integration test, Granger causality test, and Ordinary Least Square (OLS) approaches. The study's findings found that Nigeria's economic development may be attributed to factors including infrastructure, currency, and inflation. Except for the labour force, all of the study's factors were statistically significant in explaining Nigeria's economic development. According to the investigation findings, the independent variables have a 96 per cent correlation with the R^2*. On the other hand, the author advocated for the government and policymakers to put these principles into action to improve infrastructure. In addition, emphasis should be paid to the construction of high-quality infrastructure.*

Keywords: *Capital expenditure, economic growth, gross domestic product, infrastructural development, Nigeria*

Introduction

Nigeria's economic production has been negatively impacted by its inability to build its infrastructure. A lot of talk about infrastructure development has taken place since then, but little or no action has been taken in the actual world. There is a constant search by government policymakers for innovative ways to boost the production of products and services in their countries. The feasibility of a country's infrastructural facilities determines its industrial growth. According to Sawada (2015), infrastructure requires industrialisation and economic development. A firm, region, or country's core physical system is referred to as its "infrastructure." Infrastructure includes, but is not limited to, public transit, telecommunications, sewage, and electric water systems. It also involves developing and upgrading essential services to stimulate economic growth and enhance living standards. Water, ICT, roads, and sanitation are some of the infrastructural components that may be improved upon.

Oke (2013); Fung, Garcia-Hervero, Lizaka, & Sin (2005) distinguished complex infrastructure and soft infrastructure. Human capital and educational institutions like universities are examples of "soft" infrastructure, which deals with the development of infrastructure in the form of things like roads, bridges, and sewers. Social infrastructure (e.g., schools, waste disposal plants and sports facilities) is another kind of infrastructure that improves the quality of life (human capital) and economics. Innovation, creation, and increased production are all made possible by building up one's human capital.

Without a well-functioning infrastructure sector, it is almost impossible for the economy to expand and thrive. Today, West African economies are among the least competitive in the world and have the lowest levels of production among low-income countries.

Infrastructure development has a strong impact in stimulating FDI and also serves as an encouragement for foreign investors to operate effectively, according to Movisset (2000), Asiedu (2002); Sekkar, &Varoudakis (2005); John (2018). Third-world countries benefit significantly from the availability of physical facilities such as ports, roadways, trains and communication networks and a stable government.

The World Bank's infrastructure for development report (1994) correctly stated that social and economic infrastructure might aid in socio-economic development. An appropriate supply of infrastructure services is widely acknowledged as a necessary component for productivity and growth. Developing a new area will be very difficult without this infrastructure and services. In the long run, this will have a detrimental impact on the economy's ability to produce, which will result in a decreased production capacity and a shortage of products and services.

Economists and policymakers feel that adequate investments in infrastructure are critical to the growth and development of society and the economy. To make industry and agriculture more successful, the "wheel of economic activity" that infrastructure plays is critical, according to the World Bank (2007), to meet the Millennium Development Goals. Small and medium-sized businesses, in particular, are affected by it, as is profitability, production, and employment. Additionally, it influences the international trade cost and service equalization that is crucial to determining market competitiveness. According to Patunola-Ajayi (2011a), this is a primary reason why Nigerian products are so costly, which weakens the country's capacity to compete in the global market.

According to the goal 20:20 established by the Nigerian government to become one of the world's top 20 economies by 2020 with a minimum GDP of $900 billion and a per-capita income of not less than $4000 per year, infrastructure development is vital to its success. There are about 206,802,324 people in Nigeria, 52.11% of whom live in urban areas (107,112,526), a population density of 220 people per km2 (586 people per miles), and a total land area of 910,770 square kilometres (351,650 sq miles). They were joined by Obasanmi, Igbato, and Nedozi (2014). In Nigeria, 84% of the population lived on less than $2 a day in 2009, while the urban population was estimated to be 51% in 2011. After India and China in 2050, Nigeria will be the third most populous nation globally, behind only India and China.

One of Nigeria's critical economic issues stems from the country's low level of infrastructure services. An economic and social infrastructure that supports the growth of small and medium-sized businesses (SMEs) may positively impact the Nigerian economy's productivity. Corruption, consolidation of previous development initiatives by succeeding administrations, efficient usage, effective management, upkeep of assets, and inflation are further problems limiting Nigeria's ability to build out its infrastructure. Nigeria's economic growth is a primary focus of this study, which examines the influence of infrastructure development. Consequently, the article is broken up into five parts, each of which deals with a different aspect of the study: the introduction, the literature review, the research technique, or the findings and conclusions.

Literature Review

Theoretical Framework

Empirical literature

Several academics have attempted to explain the link between infrastructure development and economic growth in Nigeria, but their conclusions have been mixed. Different periods, methods, and factors were to blame for the research findings discrepancies. According to economic development literature, investment in infrastructures such as a well-developed transportation system, schools, and hospitals is essential for an economy to expand and flourish. Between 1970 and 1980, Ascharter (1989) studied the U.S. economy to see how infrastructure influenced economic development. The findings, which showed a high correlation between GDP and public capital in industrialized nations, sparked a lot of attention. Total factor productivity was found to grow by 0.39 per cent if public money increased by 1 per cent. He pointed out that the private production elasticity concerning public capital stock was 42 per cent. In 1993, he looked at whether public investment in infrastructure could be considered a component of production on par with labour and private capital in the production process of the private sector.

Between 1980 and 1998, Awogbemi (2006) studied the influence of Nigeria's private capital stock on economic development. Non-military, net investment; private capital stock; one-year lag GDP and electricity supply versus GDP were regressed by the researcher. According to his findings, GDP was positively correlated with the private capital stock by one year and inversely correlated with recurrent and capital expenditure technological change.

The link between government spending and economic development in Nigeria was investigated by Nurudeen and Usman (2010) between the years 1970 and 2008. They used cointegration and the Error Correction Method (ECM) to achieve their results. As a consequence of the research, it was discovered that government overall capital spending, overall recurrent expenditure, and government investment in education harmed economic development. Increasing government investment in transportation and communication, on the other hand, leads to a rise in economic growth.

Using simultaneous analysis, Nedozi, Obasanmi, & Ighata (2014) examined the development of infrastructure and economic growth in Nigeria between 1981 and 2013 using a variety of methods. The Ordinary Least Square (OLS) approaches were used to specify and assess the two models in the dataset. It was discovered from the findings that infrastructure is an important component of the development process. Babatunde, Salisu, & Oseni (2012) used a multivariate model of simultaneous equations to examine the influence of infrastructure on economic development in Nigeria between 1970 and 2010. They found that infrastructure had a positive impact on growth between 1970 and 2010. The research team used least square approaches in three steps to capture the transmission routes via which infrastructure had an influence on growth in the study. In the end, it was discovered that infrastructure investment had a direct influence on the entire production while also indirectly stimulating the development of other industries.

Using Unit Root, Johansen Co-integration and Error Correction Model (ECM) approaches, Anochiwa & Maduka (2014) evaluated the influence of human capital and infrastructure on economic development in Nigeria between 1970 and 2010. Growth was shown to be positively influenced by human capital, which was statistically significant. Electricity is a positive infrastructural variable, although it is statistically inconsequential.

Owolai - Merus (2015) examined the growth of Nigeria's infrastructure and economy from 1983 to 2013. Dickey-Fuller and Granger Causality tests were used in the study. According to the findings, economic development in Nigeria is positively impacted by infrastructure (as measured by Gross Fixed Capital Formation). The Granger Causality test found no link between the two variables in Nigeria.

Between 1970 and 2014, Ogunlana, Yaqub, & Alhassan (2016) used Co-integration and Error Correction Method (ECM) to study the influence of governmental and private investment on infrastructure on economic development. The unit root establishes the long run connection and long-run parameters: infrastructure and total labour force associated inversely with economic growth.

Using the Ordinary Least Square (OLS) method, Michael (2016) asserted that the relationship between infrastructure development and economic growth in Nigeria between 1981 and 2013 employed two models, one of which is a Cobb Douglas production function, into a single model that he estimated using the Ordinary Least Square (OLS). The findings indicated that infrastructure (as assessed by the road component alone) is critical for Nigeria's economic development.

Orji, Worika, & Umofia (2017) used Ordinary Least Squares (OLS) analysis to examine the impact of Nigeria's industrial infrastructure from 1990 to 2015. Index of energy consumption, gross capital formation, and federal government expenditure on transportation and communication were utilized as indicators for infrastructural development in Nigeria's industrial sector. This study demonstrated an insignificant but considerable influence on industrial value-added from the energy consumption index, whereas a negative but negligible impact from the index of gross capital formation and federal government expenditure was found.

Ogbaro, & Omotosho (2017) explored the importance of infrastructure development in fostering economic growth in Nigeria between 1980 and 2015, adopting the Cobb-Douglas production function, which represents infrastructure as a stock variable is defined and estimated using the OLS approach. The study demonstrated the positive and substantial benefits of total air transport, communication, electricity infrastructure and complete rail lines on economic growth with an estimated elasticity of 0.035, 0.016, 0.141 and 0.132.

Analyzing the influence of infrastructure improvement on Nigeria's economic growth and poverty, Mustapha, Tukur, & Ajayi (2018) used OLS. Government capital spending was also employed as a proxy for infrastructure development in the research. SURE approaches were used to examine the data. They seemed to be unrelated regression estimates. Consequently, economic growth, employment, and actual earnings all contribute to reducing poverty. Studies suggest that factors such as population increase and education spending significantly impact economic development. There was a strong correlation between the employment model's results and factors such as economic development, education in health, agriculture, and transportation. On the other hand, an accurate salary is positively correlated with capital expenditures in education, health, and transportation.

Ebuh, Ezike, Shitile, Smith, & Haruna (2019) studied the relationship between infrastructure and Nigeria's economic development between 1997 and 2017 for policy design and execution. The time series vector error correction Granger causality approach was used in this work (VECM). According to the research, a more robust financial infrastructure and a more extensive stock of physical infrastructure in

Nigeria would lead to a larger, more robust real economy in the long term.

In summary, the literature analysis revealed that social services such as roads, schools, hospitals, and agriculture all contribute to economic development. Additionally, the study indicated that the consequences varied significantly between countries due to various policies implemented. Agriculture, rural education, transportation, and communication all have a significant beneficial effect on economic development. Several studies examined the influence of infrastructure development on economic growth but could not give precise information. Thus, this report advances past research by examining the impact of various infrastructure amenities on Nigeria's economic growth and development.

Data and Methodology

The time-series data utilized in this research covers 1981 to 2019. Gross Domestic Product, Infrastructure, Exchange Rate, Labour Rate, and Inflation Indicators from the Central Bank of Nigeria Statistical Bulletin (CBN), as well as World Development Indicators (WDI), were utilized as dependent and independent variables, respectively (WDI). This research examines the causal association between GDP, INFR, EXTR, LBR, and INFL using the multiple linear regression statistical method using Ordinary Least Square (OLS) approaches.

Model Specification

This study employed Cobb-Douglas production function.

$Q = f(K^{\alpha} L^{\beta})$ ……………………………………………..

From the main Cobb-Douglas production function

$Q = f(K^{\alpha} L^{\beta})$ ……………………….. (1)

$K^{\alpha} = g(Infr, Extr, Infl, Q)$ ……………….. (2)

From equation (1)

$Q = \pi_0 + \pi_1 K^{\alpha} + \pi_2 L^{\beta} + \mu$………………… (3)

From equation (2)

$K^{\alpha} = w_0 + w_1 Infr + w_2 Infl + w_3 Extr + w_4 Q + e$ ….. (4)

Using the reduced form of structural equation of simultaneous model.

Equation (4) is substituted into equation (3)

$Q = \pi_0 + \pi_1(w_0 + w_1 Infr + w_2 Inf + w_3 Extr + w_4 Q + e) + \pi_2 L^{\beta} + \mu$……. (5)

$Q = \pi_0 + \pi_1 w_0 + \pi_1 w_1 Infr + \pi_1 w_2 Infl + \pi_1 w_3 Extr + \pi_1 w_4 Q + \pi_1 e + \pi_2 L^{\beta} + \mu$……. (6)

Collect the like terms

$Q = \pi_1 w_1 Q = \pi_0 + \pi_1 w_0 + \pi_1 w_1 Infr + \pi_1 w_2 Infl + \pi_1 w_3 Extr + \pi_1 e + \pi_2 L^{\beta} + \mu$……….. (7)

$Q(1-\pi_1 w_4) = \pi_0 + \pi_1 w_0 + \pi_1 w_1 Infr + \pi_1 w_2 Infl + \pi_1 w_3 Extr + \pi_2 L^{\beta} + \pi_1 e + \mu$…………(8)

Divide through by $1-\pi_1 w_4$

$Q = \delta_0 + \delta_1 Infr + \delta_2 Infl + \delta_3 Ext + \delta_4 L^{\beta} + V$………… (9)

Linearize equation (9)

$InQ + \delta_0 + \delta_1 InInfr + \delta_2 InInfl + \delta_3 InExtr + \delta_4 InL^{\beta} + V$……….. (10)

In order to investigate the impact of infrastructural development on the economic growth of Nigeria. The model for this study was specified thus:

GDP = f(INFR, EXTR, LBR, INFL)…………………………….(1)

Where;

GDP = Gross Domestic Product

INFR = Infrastructure

EXTR = Exchange rate

LBR = Labour rate

INFL = Inflation

The model in its econometric linear form can be written as:

$GDP = \alpha_0 + \alpha_1 INFR + \alpha_2 EXTR + \alpha_3 LBR + \alpha_4 INFL + \mu$…………. (2)

μ = stochastic random error term

α_0 = constant intercept

$\alpha_{1-}\alpha_4$ = coefficients of associated variables

DATA ANALYSIS AND RESULTS

The theoretical expectations about the signs of the coefficients of the parameters are as follow:

$\alpha_1 > 0$, $\alpha_2 < 0$, $\alpha_3 > 0$, $\alpha_4 > 0$

Empirical Results

Table 1.1 Summary of Descriptive Statistics of the Variables in the study model

	GDP	INFR	EXTR	LOG(LBR)	INFL
Mean	3.10E+13	420.6169	94.14346	17.51721	19.14646
Median	7.06E+12	257.6900	101.6973	17.53975	12.55496
Maximum	1.46E+14	1059.270	306.9210	17.96224	72.83550
Minimum.	1.39E+11	170.2800	0.617708	17.02855	5.388008

Std. Dev.	4.20E+13	270.3798	92.82186	0.269790	17.06283
Skewness	1.290715	0.758261	0.810180	-0.191225	1.783591
Kurtosis	3.430924	2.146608	2.854578	1.812647	4.997667
Jarque-Bera	11.13040	4.920688	4.300915	2.528620	27.16262
Probability	0.003829	0.085406	0.116431	0.282434	0.000001
Sum	1.21E+15	16404.06	3671.595	683.1713	746.7120
Sum Sq.Dev.	6.72E+28	2778000.	327404.1	2.765892	11063.33
Observations	39	39	39	39	39

Source: Author's Computation, (2021)

The summary of the descriptive statistics of data used in modeling the impact of infrastructural development on economic growth in Nigeria (1981-2019) are represented in the table 1.1 above. The average mean and median value of INFR (420.6169) i.eINFR is the highest among others (i.e GDP = 3.10E+13, EXTR = 94.14346, LOG (LBR) = 17.51721 and INFL = 19.14646 respectively. Also, it confirms that 1059.270 is the maximum and 0.617708 the minimum. It is clear that INFR is highly volatile with the highest standard deviation. The values of skewners and kurtosis were also computed for 39 observations. Result exhibit that all positively skewed which implying that they are left long tail. Evidence from the Jarque-Bera (JB) statistical test indicated that none of the variables shown a departure from normality, thus, the variable is considered to have a normal distribution.

Unit Root Test Analysis

Considering that the data for the study is a time series, the Augmented Dickey-Fuller (ADF) unit root test was used to check that the data was stationarity and to prevent the issue of false regression from occurring. When attempting to determine whether or not there is a long-run link between the variables in the model, the Johansen test for co-integration is used. To determine the rate of adjustment from short-run equilibrium to long-run equilibrium, the Ordinary Least Square (OLS) model was also used.

Table 1.2. Result of Augmented Dickey- Fuller unit root test result

Variables	ADF test statistic (At level)	ADF test statistic.	5% critical value	Order of Integration
GDP	3.5359	-7.9387	0.0000	I(0)
INFR	3.1787	-4.0387	0.0033	I(0)
EXTR	1.4000	-4.2576	0.0018	I(0)
LBR	2.4386	-0.9553	0.7548	I(0)
INFL	-2.9156	-5.6726	0.0000	I(0)

Source: Author’s Computation, (2021)

Table 1.3. Result of Phillip- Perron unit root test result

Variables	ADFtest statistic (At level)	ADF test statistic	5% critical value	Order of Integration
GDP	10.4157	-8.4103	0.0000	I(0)
INFR	2.7645	-3.9803	0.0039	I(0)
EXTR	1.3487	-4.1577	0.0024	I(0)
LBR	1.2345	-2.2703	0.1865	I(0)
INFL	-2.7850	-9.6693	0.0000	I(0)

Source: Author’s Computation, (2021)

The Augmented Dickey-Fuller unit root test result presented on table 1.1 and Phillip- Perron unit root test result presented on table 1.2 indicated that all the variables are stationary in their levels. However, with their first differences, growth rate of GDP, INFR, EXTR, LBR and INFL, that is, they are I(0) since ADF value of each of these variables are greater than the 5% critical value in table 1.2 and 1.3. With these results all variables are regressed at their non stationary level. This development further necessitates a co-integration.

Johansen Co-integration Test

Having established that the variables are stationary at level, then, proceed to co-integration test using Johansen and Juselius (1990) techniques to determine whether there is at least one linear combination of the variables that has long run relationship. As can be seen from the trace statistics, here only the absolute values of GDP is greater than 5% critical value [i.e GDP (97.0168 > 69.8189)], also its Eigen-value is greater than 5% level of significance, signifying the presence of long-run relationship among the variables employed in the analysis. The test statistics strongly reject the null hypothesis of co-integration in favour of four co-integration relationship.

Long run relationship between the variables

Johannes co-integration

The Johannes co-integration test is conducted with the purpose of examines the presence or absence of co-integration among the variables. The presence co-integration will then be an indication or confirmation of a long-run econometric relationship among the variables.

Table 1.4 Johansen Co-integration Test

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.6855	97.0168	69.8188	0.0001
At most 1 *	0.4606	54.2140	47.8561	0.0112
At most 2 *	0.3611	31.3699	29.7970	0.0327
At most 3	0.2326	14.7895	15.4947	0.0637
At most 4 *	0.1262	4.99356	3.84146	0.0254

Source: Author’s computation, (2021)

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

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 1.5 Johansen Co-integration Test

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.6855	42.8028	33.8768	0.0033
At most 1	0.4606	22.8440	27.5843	0.1802
At most 2	0.3611	16.5803	21.1316	0.1927
At most 3	0.2326	9.79602	14.2646	0.2257
At most 4 *	0.1262	4.99356	3.84146	0.0254

Max-eigenvalue test indicates 2 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Both the trace and the maximum Eigen value tests results in table 1.4 and 1.5 respectively reject the null hypothesis of no co-integration. The results for trace statistic test indicate three co-integrating equation while maximal eigen statistic tests indicate two co-integrating equation which imply that there exists a long-run relationship among the variables used in the model.

According to Gujarati et al (2009), as the critical values increase, the p-values decrease. Given that the p-values in table1.4 and 1.5 are closer to zero the null hypotheses is rejected with increasing confidence, Since all the variables are I(0) and there is evidence of co-integration, the Granger causality.

Table 1.6 Result of Ordinary Least Square (OLS)

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	7.83E+14	2.44E+14	3.212864	0.0029
INFR	1.38E+11	1.59E+10	8.688190	0.0000
EXTR	1.81E+11	5.17E+10	3.492536	0.0013
LOG(LBR)	-4.74E+13	1.42E+13	-3.345354	0.0020

INFL	1.46E+11	9.64E+10	1.516891	0.1385

R-squared 0.9551 Ajusted R-squared 0.9498, F-statistic 180.6163, Pro (F-statistic) 0.0000

Durbin-Watson stat 0.3791

Source: Author's computation, (2021)

Table 1.6 summarizes the findings, conclusions, and recommendations based on the examination of the data. The findings reveal that independent variables had an influence on Nigeria's GDP, which includes factors like infrastructure, the currency rate, the labor force, and inflation. In this part, the regression analysis was given using the Ordinary Least Squares (OLS) test.

There are also different statistical tests shown in table 1.6 to confirm the findings such as standard error, t-statistics, adjusted R^2 and Durbin-Watson (DW). All of these factors were at a constant 1% and 10% in terms of GDP and the exchange rate correspondingly.

The modified R2, standard error test, and DW statistics in table 1.6 demonstrate the relevance of the parameter estimations. This demonstrates that all of the calculated parameter values are statistically significant. The model's adjusted R-squared (R^2) has a value of 90%. This is a very high result. This means that the systematic variables in the level of GDP in Nigeria's economy over the observed years were GDP, infrastructure, exchange rate, labor rate, and inflation, with an indication of strong goodness of fit, and that the remaining less than 1 percent variation was explained by other determining variables represented by white noise in the model. in the GDP model.

Durbin Watson has a value of 0.3791. A positive first order serial autocorrelation among the model's explanatory variables is shown by this location in the determinate area. The coefficients reveal that GDP, Infrastructure rate, and Exchange rate are the most important variables. The GDP of a nation is strongly influenced by the size of the labor force and the inflation rate. As these factors rise, so does the country's overall GDP and its rate of economic development. In the meanwhile, the findings demonstrated that GDP is negatively impacted by labour force.

Table 1.7 Result of test for serial correlation

Breusch-Godfry Serial Correlation LM Test

F-statistics	52.2188	Prob. F(1,33)	0.0000
Obs*R-square	23.8977	Prob. Chi-Square(1)	0.0000

Source: Source: Author's computation, (2021).

The result of the serial correlation shows a probability value of 0.0000 which is less than 0.05 indicating the rejection of HO_0. However, the study concludes that there is serial correlation in the model.

Granger Causality Test

Table 1.8 Result of Granger Causality Test

Null Hypothesis:	Observations	F-Statistic	Prob.
INFR does not Granger Cause GDP	38	9.44030	0.0041
GDP does not Granger Cause INFR	38	0.95426	0.3353
EXTR does not Granger Cause GDP	38	25.4226	1.E-05
GDP does not Granger Cause EXTR	38	2.76684	0.1052
LBR does not Granger Cause GDP	38	10.3053	0.0028
GDP does not Granger Cause LBR	38	2.01992	0.1641
INFL does not Granger Cause GDP	38	0.00525	0.9426
GDP does not Granger Cause INFL	38	0.86791	0.3579
EXTR does not Granger Cause INFR	38	23.3420	3.E-05
INFR does not Granger Cause EXTR	38	0.71644	0.4031
LBR does not Granger Cause INFR	38	10.0797	0.0031
INFR does not Granger Cause LBR	38	0.12965	0.7210
INFL does not Granger Cause INFR	38	0.00022	0.9883
INFR does not Granger Cause INFL	38	1.28141	0.2653

LBR does not Granger Cause EXTR	38	1.48985	0.2304
EXTR does not Granger Cause LBR	38	17.5598	0.0002
INFL does not Granger Cause EXTR	38	0.60227	0.4429
EXTR does not Granger Cause INFL	38	1.18830	0.2831
INFL does not Granger Cause LBR	38	0.09344	0.7617
LBR does not Granger Cause INFL	38	1.30663	0.2608

Source: Source: Author's computation, (2021).

According to the findings in table 1.8, INFR was found to be a granger cause of GDP, whereas LBR was shown to be a granger cause of GDP. During the time span under consideration, LBR was also discovered to be a granger cause of INFR. However, since the likelihood of LBR is significant at 5%, we do not accept the null hypothesis that LBR does not granger cause INFR; in other words, INFR does granger cause INFR, but INFR does not granger cause GDP. LBR was discovered to be the granger cause of EXTR, implying one-way causation in this situation ceteris paribus. Please see the brief note on Granger causality below for a more in-depth explanation of the idea of causality. Correlation does not always indicate causation in any meaningful sense of the term in economics (Granger, 1969). As a consequence, the econometric cemetery is littered with spectacular relationships that are either erroneous or meaningless.

Conclusion and Recommendations

Ordinary Least Square (OLS) methodology was used to evaluate infrastructure improvement and its influence on economic growth in Nigeria during the period 1981-2019. When conducting the study, the OLS approach was used after doing various preliminary tests, such as determining the stationarity of the variables using the ADF statistic, Johansen Co-integration, and the Granger causality test. According to the findings of the OLS, infrastructure, the exchange rate, and inflation all have a positive influence on economic development in Nigeria; however, the labour force has a negative impact on economic growth in the country. Using econometric methods, the researchers discovered a unidirectional causation link between INFR, GDP, LBR, and EXTR.

According to the research findings, it is required to build a policy framework that promotes the development of the power supply, agricultural, transportation, and communication sectors to achieve fast growth. As an additional component of this strategy, the private sector must be actively engaged via public-private partnerships (PPPs), with the government providing an enabling climate for this to flourish.

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