# Impact of Infrastructural Development, Institutional Quality and Industrial Sector Performance in Nigeria

**Umaru Musa, Abu Regina Aloho, Aliyu Rilwan Saad, Ndigefa Ernest Johnson Oluwaseum Adeniran Sunday**
Department of Economic, Federal University Wukari, Taraba State.
Department of Economic, University of Calabar, Cross River
Department of Banking and Finance, Federal University Wukari, Taraba State.
Department of Economic, Federal University Wukari, Taraba State.
Department of Economic, Federal University Wukari, Taraba State
DOI: 10.56201/ijssmr.vol.11no7.2025.pg51.59

***Abstract***
*This* study *examined the impact of infrastructure, institution on industrial performance in Nigeria. The annual time series data was collected from world development indicator and Central bank of Nigeria respectively, covering 38 years span from 1986 to 2023 were used. The expost factor research design was used for this work. The study employed the econometric estimation technique of Autoregressive Distribution Lag (ARDL) model was used for the analysis, adopting annual data method of analysis. The findings from the result estimated, all explanatory variables were consistent with a prior expectation. This implies that a unit increase real interest rate (RINT), inflation (INFL), and employment (EMPL), will lead to decrease in industrial performance by about 0.2588, 0.07145, and 0.24175. Also, the result show that a one percent increase in the log of foreign direct investment foreign direct investment result to about 1.56 increase in an industrial performance ceteris paribus. The study indicated that the study recommended that the government should intensify efforts towards creating a conducive and friendly environment for investors and combat the level of insecurity to attract the foreign direct investor into economic.*

## INTRODUCTION

Nigeria like many other Sub-Saharan African countries has been plagued with the lack of functional infrastructure in order to grow. This poor state of infrastructure has now engaged the attention of many African governments, especially in attracting foreign investments, as the development of infrastructural facilities is one of the determinants of foreign direct investments inflow into any economy. Infrastructure contributes to raising the quality of life by creating amenities, providing consumption goods (transport, energy and communication services and contributing to macroeconomic stability. In the sub-Saharan region, Nigeria in particular traffic congestion, power black outs in major cities, bad quality of roads, access to capital and market, inadequate telecommunication services, shortage of drinking, irrigation and industrial water, all bear witness to the inadequate existing infrastructure facilities. Even schools are not equipped with basic infrastructure that enhances human capital development. Infrastructures in certain remote areas can serve as an incentive to attract certain levels of industrial activities in such places, in that wise, infra structure provision facilitates investment in less developed areas. With electricity for example, farmers in rural areas can easily process their harvested cassava roots into gain flour. Infra structure provision is therefore fundamental for successful rural transformation and

agricultural development. The role of infrastructures has renewed attention over the years. According to Calderon and Serven (2004) and Estache et al. (2005), from the policy point of view, the renewed concern with infrastructure can be traced to the world-wide developments that took place over the last two decades.

One of the prerequisites for sustainable industrial development is the existence and functioning of strong institutions. These institutions play a key role of creating enabling environment and facilitating and supporting the industrial development and growth process. Supporting institutions need to be efficient, capable and contributing development agents through their quality services using a vibrant civil service. Most of the current infrastructural facilities in Nigeria were developed during the second national development plan between (1970 1974). According to Ekundare (1971), it is no surprise that the main emphasis of the second national plan is on social change, which is to lay the foundation for the development of public infrastructure for productive, and consumption purposes due to the oil-boom accruing to the country. The transmission mechanisms of infrastructure to growth are abundant in the economic growth literatures. The first transmission mechanism is given by Aschauer (1989) and Barro (1990). They opined that investments in public infrastructure enhance private sector productivity. They argued that increase in public capital stocks has a positive but decreasing impact on the marginal product of all factor inputs. Thus, the cost of production inputs falls and the level of private production increases.

**Statement of Problems**

It is believed that an adequate supply of social amenities and infrastructure services has long been Viewed as a key ingredient for economic development, but in Nigeria ranks at the bottom of all developing regions in virtually all dimensions of infrastructure performance (World Bank, 2017a). World Bank (2017a) observes that there are varying trends in the region's infrastructure performance across key sectors. In telecommunications, Sub-Saharan Africa has seen dramatic improvement in the quantity and quality of infrastructure, and the gains are broad-based.

Access to safe water has also risen, of the population having access to water in 2015, from 51 percent in 1990, but disparities between rural and urban access rates persist. Also, the bank further observes that in the power sector, by contrast, the region's electricity-generating capacity has changed little in more than 20 years. At about 0.04 megawatts per 1,000 people, capacity is less than a third of that of South Asia and less than one-tenth of that of Latin America and the Caribbean. There is some variation by country, with little progress in electricity-generating capacity per capita in the region's low-income countries (LICs) and lower-middle-income countries (LMCs), but more than a doubling of capacity among upper-middle-income countries (UMCs). Access to electricity is low, at 35 percent of the population, with rural access rates at less than one-third of urban ones. Per capita consumption of energy in Sub-Saharan Africa (excluding South Africa) is 180 kWh, against 13,000 kWh per capita in the United States and 6,500 kWh in Europe.

The African Development Bank (2018a) estimates that electricity costs three times more in Africa than in comparable developing regions, and most manufacturers operating in West and East Africa have to rely on expensive backup generators as a primary energy source, which adversely affects their profit margins. At the same time, weak transportation networks hinder manufacturers' ability to capitalize on regional economies of scale. Transport infrastructure is likewise lagging, with the region registering the lowest road and railroad densities among developing regions. Nigeria is one of the sub-Sahara African country where road density has declined over the past 20 years (1990–2011). Despite a doubling in access to improved sanitation

facilities, the access rate remains low, at about 30 percent in 2015; the largest gain in access has been in rural areas and LICs.

Infrastructural deficit adversely affects manufacturing output and depletes the contribution of the sector to the Gross Domestic Product of the nation. In 2023, a lack of foreign exchange forced 18 to 20% of manufacturing enterprises to close, resulting in significant unemployment. Also, the price of diesel had risen from N847 to N900 per litre, which has raised the cost of manufacturing astronomically. Other issues confronting the manufacturing sector include multiple taxation, government use of touts to harass enterprises, rising insecurity, failure to tackle concerns raised about the African Continental Free Trade Area (AfCFTA), and repatriation of funds. (MAN, 2023).

This development is perhaps attributed to over concentration on crude oil which shifted attention of Nigerian economy away from non-oil sector resulting to low level of the GDP growth rate evidenced in decayed infrastructure and attendant low level of investment (Kareem 2015).

**Theoretical Framework**

**Endogenous Growth Model**

According to Romer (1990), technological progress increases the growth of capital stock. This increases the level of output, which raises the proportion of output allocated to saving and investment, accelerating economic growth even further. Technological progress is the result of economic agents' investments. The output generated per hour worked rises as capital accumulation and technological change combine. People intentionally respond to market incentives to bring about technological change, so it is assumed that technological change is endogenous. Technology is also assumed to have a fixed cost because it may be used repeatedly without incurring additional costs after the initial development cost is incurred. Human capital, according Romer (1990), is a major determinant of economic progress. Since technological change exists independently of the individual, human capital is assumed to be separate from the technological component. Individuals with higher of education are more productive and have more skills. As a result of differences in human capital formation can be utilized to explain differences in labor productivity and per capita income.

**Institutional Theory of Governance**

Institutional theory was propounded by John Meyer and Brian Rowan in the late 1970s to explain the influence of the society in shaping the organizations interaction with the global environment Institutional theory is used to explain the underlining and more resilient nature of social structure. The theory seeks to explain the processes by which organization structures, rules, norms and schemes are entrenched as authoritative guidelines for social behavior (Scott 2004). According to Di Maggio and Powell (1991) the institutional theory to believe that institutional environment exerts significant influence in development of formal structures of organizations, more then, the market pressures. Institutional theory emphasizes the importance of self-interest motives of individuals, and focus instead on institutional factors or pressure surrounding organizational boundary (Hoffman 1999). The theory considers organization as operating within a varied norm, value

**Infrastructure as a Constraint to Growth Theory**

The theory was found by Eliyahu M. Goldratt in his 1984 book The Goal, the Theory of Constraints. This theory highlights that inadequate infrastructure can act as a constraint on

economic growth and development. Insufficient infrastructure, including transportation bottlenecks and inadequate power supply, can hinder productivity and discourage private investment. The World Bank's perspective underscores the importance of addressing infrastructure deficiencies to promote economic development. This theory is relevant as it emphasizes the significance of overcoming infrastructure challenges to foster sustainable economic growth (World Bank, 1994).

## Empirical Literature

### Infrastructure and industry

Umofia et al (2018) analysed the effects of infrastructure on the performance of the industrial sector of the Nigerian economy using time series from 1980-2016. One of the results of this work shows that electricity supply has a positive and insignificant impact on the value added of the industrial sector while gross capital formation as well as government expenditure have a positive and significant impact. By examining links between infrastructure and value added in the manufacturing sector of Sub-Saharan African countries.

Azolibe and Okonkwo (2020) examined whether the state of infrastructure development in sub-Saharan Africa actually drives industrial sector productivity using panel data techniques on 17 countries over the period 2003-2018. Their results indicate that the main factor influencing industrial sector productivity in sub-Saharan Africa remains the quality and volume of telecommunications. It also shows that low productivity in the industrial sector is largely due to low levels of electricity infrastructure and underutilised water and sanitation infrastructure. f

Ekundayo and Amarachi (2016). They examined the impact of social and economic infrastructure variables on the performance of the manufacturing sector and whether rampant inflation is responsible for the depression of the sector. The results show that teledensity, government expenditure affect positively and significantly the performance measured by the value added of the manufacturing sector. However, the authors also find that health expenditure, electricity production and consumption, and inflation have a negative and insignificant impact on the performance.

Antle in Uwagboe (2011), for example estimated a Cobb-Douglas production function for 47 developing countries and 19 developed countries. Infrastructure was specified as gross national output from transportation and communication industries per square kilometer of land area. Antle found that transportation infrastructure was an effective factor of production.

### Institution and Industry

Barron (1999) examined democracy's determinants using a panel analysis of over 100 industrialized and developing nations from 1960 to 1995. Per capita GDP, primary schooling, and a smaller gender gap in elementary school attainment improve democracy. The Lipset–Aristotle hypothesis, which claims that higher per capita income and primary school completion strengthen democracy as measured by electoral rights and civil liberties, is supported by the data. Democracy declines when urbanization and natural resource dependence rise. It showed that democracy rises with middle-class income, not country size.

Robinson (2001) examined how institutions affect economic performance in 64 developing nations. By using panel ordinary least squares (OLS), institutions and economic performance are robust to controlling variables like climate, ethnolinguistic fragmentation, latitude, religion, health condition, soil quality, natural resources, and current racial composition. They further stated that colonial practices did not predetermine institutions and could be modified.

Uddin, Ali, and Masih (2021) examined human capital, institutions, and economic growth in 120 developing nations between 1996 and 2014. The dynamic system GMM shows that human development and institutions boost economic growth. Institutions and human development interact to negatively impact emerging countries' economic progressing of high inflation, not real growth.

Aiyedogbon and Anyanwu (2015) examined the macroeconomic factors of Nigerian industrial productivity from 1981 to 2013. Using the OLS method, they found that the exchange rate boosts Nigerian industrial productivity. The study also found that the interest rate, foreign direct investment, and real GDP directly affect the industrial production index. However, broad money supply, consumer price index, and manufacturing sector loans hurt Nigerian industrial sector development. Otalu and

Anderu (2015) examined Nigerian industrial sector growth variables. Industrial growth was determined by capacity utilization, gross capital creation, labor, education as assessed by school enrollment, inflation rate, exchange rate, trade openness, and power generation. The results from the cointegration and ECM approaches reveal that all factor determinants have a persistent effect on industrial output growth. Capital and labor have a big impact, and the exchange rate is positive and considerable, suggesting that currency appreciation may hurt industrial sector growth.

Sokunle and Chase (2016) examined how government incentives and foreign direct inflows affected manufacturing and economic growth in 26 sub-Saharan African nations between 2008 and 2010. They found that interest rates, inflation, government incentives, and FDI did not affect manufacturing sector development. The report reveals that corruption and political instabilities in several African countries have slowed manufacturing sector expansion in sub-Saharan African countries.

Mohsen, Chua, and Che Sab (2015) examined Syria's 1980–2010 industrial output factors. The following estimators were used in the study: the Johansen co-integration test, the Granger causality test, impulse response functions, variance decomposition analysis, and stability tests. Industrial production is positively associated with manufactured exports, capital, agricultural output, and population but adversely related to oil prices. Industrial output depends most on agricultural output growth. In the short and long run, oil prices, capital, population, manufacturing exports, and agricultural output were bi-directionally causative of industrial output. seeking undertones that hurt economic performance.

Udah, Ubi, and Efiom (2016) examined Nigeria's economic performance and institutional quality between 1970 and 2010 using the co-integration and error correction models. Property rights and governance efficacy are crucial to the country's economic performance. Property rights and governance structure, along with strong reform programs and political leadership, define macroeconomic reform outcomes, economic performance, and sustainable development.

Olayungbo and Adediran (2017) used autoregressive distributed lag to look at the growth effects of institutional quality and oil revenue in Nigeria from 1984 to 2014. The results showed that Nigeria's corruption score (indicating poor institutional settings) boosts output growth in the short term but slows it in the long term. Oil revenue boosts short-term economic growth but slows long term growth. The findings validated Nigeria's resource curse, or Dutch disease. Thus, oil revenue affects Nigeria's growth compared to the institutional framework. Institutional settings are more essential to understanding oil revenue's impact on economic growth.

**Research designed**

This study adopts ex-post facto research (after the fact) design. This is because the events had already taken place before the investigation was carried. The choice of this method is made

because the researcher has no direct control of the independent variables, and inference about the link or relationship between domestic debt and investment on economic growth in Nigeria are made without the current interaction between the dependent and independent variables ( Ndiyo, 2005). The study uses the framework of Ordinary Least Square which involves testing of unit root using techniques like ADF and Philip Perron to test for the unit root and ARDL for estimation.

**Model specification**

This study is based on the use of an equation with the growth rate and institution as a dependent variable and, infrastructure, institution as independent variables. The equation is anchored on an eclectic theoretical Infrastructure anchor as a Constraint to Growth Theory, endogenous model

because a single theory cannot link the relationship between, infrastructure, institution and industry. The theories adopted comprises endogenous growth theory. The endogenous growth model posits that the main driver of economic growth is investment by firms in research and development and the resultant diffusion of the knowledge created from such efforts throughout the economy. The theory also identifies the quantity of capital, and by implication capital accumulation and therefore investment, as one of the determinants of economic growth in the long run.

This identification of investment as a major determinant of economic growth in the long-run by the endogenous growth theory provides the basis for the inclusion of investment as an independent variable in the two study equations as shown below:

$$Q = f\left(A, L^{\beta}, K^{\varphi}\right)$$

Where

Q = Output (economic growth)
A = Technology
L = Labour input
K = Capital input
$\beta$ & $\varphi$ = Returns to scale

**Data estimation techniques**

The equations for this study were estimated using the ordinary least squares (OLS) method within the framework of Autoregressive Distributed Lag Model (ARDL). ARDL is used when there is mixed order of integration (i.e. combination of I (0) and I (1)) from the unit root test result. It equally involves just a single-equation set up, making it simple to implement and interpret; and different variables can be assigned different lag lengths as they enter the model. The choice of the ARDL model in this study was justified by the mixture of I(0) and I(1) order of integration in the unit root test results. This method is suitability for small sample investigation and the fact that it provides an unbiased estimate of the long run model.

**LONG RUN ARDL RESULT FOR INDUSTRY (IND) EQUATION.**

From the result estimated, all explanatory variables were consistent with a prior expectation. This implies that a unit increase real interest rate (RINT), inflation (INFL), and employment (EMPL), will lead to decrease in industrial performance by about 0.2588, 0.07145, and 0.24175. Also, the result show that a one percent increase in the log of foreign direct investment LOG FOREIGN DIRECT INVETMENT result to about 1.56 increase in an industrial performance ceteri paribus.

Judging from probability values 0.0009, 0.0265 and 0.0445 for RINT, FDI and EMPL respectively show that they are statistically significant because their probability values are respectively less than five percent level of significant.

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| IND(-1) | 0.871495 | 0.091205 | 9.555383 | 0.0000 |
| RINT | -0.258768 | 0.070734 | -3.658306 | 0.0009 |
| INFL | -0.071450 | 0.041689 | -1.713873 | 0.0965 |
| FDI | 1.56E-13 | 6.69E-14 | 2.330586 | 0.0265 |
| EMPL | -0.241748 | 0.123481 | -1.957773 | 0.0593 |
| C | 7.268092 | 3.469516 | 2.094843 | 0.0445 |

| | | | |
|---|---|---|---|
| R-squared | 0.818718 | Mean dependent var | 29.36474 |
| Adjusted R-squared | 0.789479 | S.D. dependent var | 5.489711 |
| S.E. of regression | 2.518818 | Akaike info criterion | 4.832850 |
| Sum squared resid | 196.6778 | Schwarz criterion | 5.094080 |
| Log likelihood | -83.40773 | Hannan-Quinn criter. | 4.924946 |

Author`s Computation 2025

**Long run result for institution (INST) Equation**

From the result estimated, all explanatory variables were consistent with a priori expectation. This implies that a unit increase gross domestic product (GDP), real exchange rate (REXCH), infrastructure (INFR), technology (TECH) will lead to increase of about 1.89, 0.00608, 0.031140 and 5.26 percent increase in industrial output in Nigeria respectively, all things been equal.

Judging from the probability values 0.0736, 0.9602, 0.8926 and 0.9760 for GDP, RECH, INFR and TECH respectively show that they are statistically insignificant because their probability values are greater than five percent level of significant

**Discussion of Finding**

Infrastructure and institution are assumed to be relevant for achieving economic growth since the provide economic activities in almost all the sector of the economy. However, this study was aimed at investigating the impact of infrastructure, institution on industry performance in Nigeria. in order to achieve to achieve the objective of the study, annual series data from 1986 – 2023 was used for the analysis. The unit root test revealed that some of the variables were stationary at levels and others were stationary at first differences. Based on the outcome of unit root test, autoregressive distribution lag model was adopted for the analysis.

Finding of the study revealed that the result estimated of Foreign Direct Investment (FDI) was consistent with a prior. In the long run, this implies that a unit decrease in industrial output in Nigeria, all things been equal. This result is in line with Maruf and Masih (2019). Investigated the relationship between infrastructure and economic growth symmetric or asymmetric between 1990 – 2016. The method employed for the study was ARDL. The paper finds a long-run asymmetric relationship between infrastructure and economic growth but symmetric relationship in the short run. The paper also suggests the expansion of investment in the infrastructural industry to boost

the growth of the Indonesian economy. The study also urges the policy makers to design robust infrastructure policies guiding the infrastructure and country's economy in both the short run and long run.

**Conclusion**

This work examined the impact of infrastructure, institution on industrial performance in Nigeria. the arguments on how increased or decreased in infrastructure affect the institution by extension economic growth, has been the main connection of the background to this study. The study formulated three specific objectives which: To determine impact of infrastructure on industry in Nigeria, to investigate the impact of institution on industry in Nigeria, and finally, to identify the impact of infrastructure on institution in Nigeria.

**Reference**

Aiyedogbon, J. O., & Anyanwu, S. O. (2015). Macroeconomic determinants of industrial development in Nigeria. Nile Journal of Busi ness and Economics, 1(1), 37–45. [CrossRef]

Aschauer, D. (1989). Is public expenditure productive*? Journal of Monetary Economics*, 23, pp. 177 200.

Barro, R.J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economics,* 98(5), pp. 103–125.

Ekundare, R.O (1971). Nigeria's second national development plan as a weapon of social change. African Affairs*, Journal of Political Science,* vol 70(279). pp146-158

Hoffman, A, J. & Ross, S. M. (2000). Institutional evolution and change: environmentalism and the us chemical industry. School of business University of Michigan Ross school of business working Paper No. 1349 February 2000 Academy of Management Journal, 42 (4)

Kareem, R.O (2015), Employment level and economic growth in Nigeria. *Journal of Sustainable development studies.* Pp. 8,53-70..

Manufacturers Association of Nigeria (2023). Uncertainty beclouds manufacturing sector in 2023. 21stCentury Chronicle of January 19, 2023. Retrieved from https://21stcenturychronicle.com/uncertainty-beclouds-manufacturing-sector-in-2023-man-chairman.

Mohsen, A. S., Chua, S. Y., & Sab, C. N. C. (2015). Determinants of indus trial output in Syria. *Journal of Economic Structures,* 4(1), 1–12. [CrossRef]

Olayungbo, D. O., & Adediran, K. A. (2017). Effects of oil revenue and institutional quality on economic growth with an ARDL approach. Energy and Policy Research, 4(1), 44–54. [CrossRef

Romer, P. M. (1990). Endogenous technological change. *The journal of political economy, 98* (5), 71-102.

Scott, W. R. (2004). Institutional theory." in Encyclopedia of social theory, George Ritzer, ed. Thousand Oaks, CA: Sage. 408-414

Sokunle, R. O., & Chase, M. (2016). The determinants of manufacturing sector growth in Sub-Saharan African countries. *Research in Business and Economics Journal*, 12, 1–9.

Udah, E. B., Ubi, P., & Efiom, L. (2016). Macroeconomic reforms, institu tions and economic performance in Nigeria*. Journal of Sustainable Development in Africa*, 18(1), 83–98.

Uddin, M. A., Ali, M. H., & Masih, M. (2021). Institutions, human capital and economic growth in developing countries. Studies in Econom ics and Finance, 38(2), 361–383. [CrossRef]

World Bank (2017a), "Africa's pulse", World Bank Group, Washington, DC, available at: http://documents.worldbank.org/curated/en/348741492463112162/Africas-pulse(accessed 21 July 2019).

World Bank (2017b), World Development Indicators, World Bank, Washington, DC.

World Bank. (1994). Infrastructure Finance in the Developing World: Potential and Challenges. Retrievedfrom https://www.worldbank.org