IMPACT OF INDUSTRIAL SECTOR ON NIGERIA ECONOMY

Abstract

Successive administrations in Nigeria have initiated one policy or the other aimed at advancing the economy through industrialization. In spite of these industrial policies, Nigeria is still at the bottom rung of development ladder as the industrial sector which was at a time contributing about 13 per cent to the GDP, and second largest employer of labour is now in comatose. Owing to this fact, this research is centered on the impact of industrial sector on Nigeria economy. It covers a period of 31years from 1990-2021. The data used for the analysis are secondary data sources from Central Bank Nigeria (CBN) Statistical Bulletin and other sources. The method of analysis adopted for the study is Ordinary Least Square (OLS). Cointegration test was also used to check the long run relationship among the variables. From the result of the OLS, it is observed that industry value added, gross capital fixed formation, labor force participation rate and trade openness which are the explanatory variables have a positive impact on economic growth in Nigeria and a long run relationship exists among the variables. The study therefore recommends that the nation's industrial capacity should be utilized to avoid idle human and material resources. The study suggests that more labor should be employed and capital formation be encouraged to induce investment.

Keywords: Industrial Sector, Trade Openness, Economic Growth, OLS, Nigeria.

JEL Codes: C32, D2, J21, L26, O14.

1. Introduction

Industrialization acts as the catalyst that accelerates the pace of structural transformation and diversification of the economy, enabling the country to fully utilize its factor endowment, depending less on foreign supply of finished goods or raw materials for its economic growth, development and sustainability. Industrialization was perceived as an instrument of economic growth that will assist the country to its macroeconomic objectives (high income, improved standard of living, self-reliance, job creation and balance of payment stability) (Central Bank of Nigeria, 2018). Some economic analysts are of the view that industries play a vital role in the economic growth and development of any country.

The industrial pattern of Nigeria during political independence in 1960 was that of providing agricultural raw materials needs of advanced economies, particularly of Britain. The bulk of national income was from exports of primary agricultural products. Available data shows that the share of agriculture in Gross domestic product (GDP) was about 63% and about 80% of export earnings of the country came from agriculture (National Bureau of Statistics, 2020). The level of

industrial activities in the country was very low and mostly commercial activities owned and run by foreign companies like the United Africa Company (UAC) Ltd, John Holt, Peterson Zonhonis (PZ), Union Trading Company (UTC). These companies engaged in the importation and distribution of (foreign) manufactured goods. Laying solid foundation for an industrial economy for Nigeria was not part of the colonial economic policy rather making the colonies perpetual producers of primary raw materials for foreign industries and importers of manufactured goods (Egwaikhide et al, 2001 & Banjoko et al, 2012).

Over the years, Nigeria has experienced mixed results regarding industry and economic growth. The country's economy was initially focused on exporting primary agricultural products, and the industrial sector was underdeveloped. However, after gaining independence, Nigeria prioritized industrialization to promote faster economic growth and development. Despite this, the industrial sector accounts for a relatively small proportion of economic activity, with manufacturing contributing only 4% to GDP. Like already stated, the oil and gas sector is the primary driver of Nigeria's economy, accounting for over 95% of export earnings and 85% of government revenue (Ayeyemi, 2013). While the sector has contributed to considerable growth, poverty remains high, and the economy exhibits characteristics typical of an underdeveloped country. Additionally, the country's external dependence on uncertain world markets persists (United Nations Economic Commission for Africa, 2016). The government has implemented various policies and initiatives over the years to promote industrialization and economic growth, such as the Nigerian Industrial Revolution Plan (NIRP) and the National Enterprise Development Programme (NEDEP). Despite the government's efforts to promote rapid industrialization in Nigeria and achieve dynamic change in the country's economic structure, the desired level of industrialization with its attendant benefits has remained elusive.

Furthermore, despite numerous studies on the relationship between industrial sector and economic growth and development, there is still a lack of consensus on the nature and direction of this relationship. Some studies have argued that industrialization is a necessary condition for economic growth, while others have suggested that a focus on other sectors, such as services or agriculture, can be more effective in driving economic development. Moreover, the majority of previous studies have focused on developed countries, with little attention paid to the experiences of developing countries. This is a significant gap in the literature, as the challenges

and opportunities for industrialization in developing countries may differ significantly from those in developed countries. Therefore, this study aims to investigate the impact of the industrial sector on economic growth and development in a developing country context, with a particular focus on the challenges and opportunities for industrialization. By doing so, this study will contribute to the ongoing debate on the role of the industrial sector in economic development and provide insights for policymakers on the most effective strategies for promoting industrialization and economic growth in developing countries.

2. Review of Empirical Literature

Nora, Ubong and Michael (2022) obtained a time series data that cover the period of 1981 to 2019 to study the nexus between industrial sector and economic growth in Nigeria, using a disaggregated approach. The study employed OLS and ARDL approaches and the result of the OLS found that the three selected components of industrial sector (manufacturing, construction and mining and quarrying subsectors) have positive relationship with economic growth. The result further showed that government expenditure, trade openness and inflation have negative relationship with economic growth, while gross fixed capital formation and labour force have significant positive relationship with economic growth. The result of the ARDL on the other hand, showed that manufacturing, construction and mining and quarrying subsectors, and gross fixed capital formation have positive relationship with economic growth, while labour force, inflation rate and trade openness have negative relationship with economic growth in Nigeria.

Sahar (2020) investigated the effect of industrial sector on economic from 1976-2015 in Pakistan using autoregressive distributed lag (ARDL). In the study, the dependent variable is GDP, while the explanatory variables are industrial output, inflation, foreign direct investment (FDI) and savings. The result of the ARDL bounds tests revealed that there is a long-term relationship between industrial output and economic growth or GDP. This study also revealed a direct relationship between industrial output and GDP in Pakistan .CUSUM (cumulative sum) test also revealed the stability of results.

Ndiaya and Lv (2018) employed the OLS technique in their study (1960-2017) which showed that there is a significant and positive relationship between industrial output and economic growth in Senegal this implies that there is a significant impact of industrial development on

economic growth. Maryam and Bassey (2018) evaluated the effect of industrial sector on economic growth in Nigeria. The variables used in the study include; inflation rate, foreign direct investment (FDI) inflows and gross savings. The result of the OLS revealed that industrial output has an effect on economic growth in Nigeria.

Cantore et al. (2017) employed generalised method of moments to study the hypothesis of a positive relationship between industrialisation and economic growth in 80 countries between 1980 and 2013 and could not reject it. Su and Yao (2017) employing panel granger causality methods found a positive relationship between industrialisation and economic growth by analysing data from 1950 to 2013.The variables in the study are, service sector, gross private savings, total factor productivity, human capital.

Ugwuanyi and Nkem (2017) carried out a study to analyse the relationship between industrialization drivers and Nigeria economic growth from 1980 to 2014 using time series data. The methodology employed was Unit Root Test, Co-integration Test, Error correction model and Granger Causality Test in determining the objectives of the research. Findings revealed that Foreign Direct Investment (FDI), Financial system Development which is proxy with Aggregate Bank Lending (ABL) and Exchange Rate (EXR) significantly stimulate the Nigeria economy while trade openness negatively influences economic growth in the long run.

In a study of 88 developed countries over the period 1950-2005, Yamak *et al.* (2016) using quarterly data and the ARDL (autoregressive distributed lag) approach with the variables; industrial output, agriculture, service sector output confirmed that industry was an engine of growth in the economy. Enwerem, Jelilov and Isik(2016) researched on the impact of industrialization on economic growth in Nigeria for the period 2000-2013.Ordinary least square (OLS) technique was used as analytical technique. The study revealed that industrialization has a negative impact on economic growth in Nigeria in the long run.

Bennett, Anyanwu and Kalu (2015) employed the method of OLS to investigate the effect of industrial development on economic growth in Nigeria between 1973 and 2013. GDP was explained as a function of foreign direct investment, industrial output, total savings and inflation and the results found that industrial output and total savings have positive but insignificant impact on economic growth. The result further showed that FDI has positive and statistical

significance with economic growth. However, inflation rate has negative but significant effect on economic growth in Nigeria.

3. Data and Methodology

3.1. Model Specification

The model of this study incorporates relevant variables so as to reflect the objective of the current study. Hence, industry value added (INVA), Labour Force Participation Rate (LFP), Gross Fixed Capital Formation (GFCF) and Degree of Trade Openness (TROP) are used as the explanatory variables and Gross Domestic Product (GDP) is used as the dependent variable. Thus, the model for the study is specified in the functional form as:

$$GDP = f(INVA, LFP, GFCF, TROP) \quad 1$$

The econometric form is written as:

$$GDP_t = \beta_0 + \beta_1 INVA_t + \beta_2 LFP_t + \beta_3 GFCF_t + \beta_4 TROP_t + \mu_t \quad 2$$

Where; GDP= Gross Domestic Product; INVA= Industry Value added; LFP= Labor Force Participation Rate; GFCF= Gross Fixed Capital formation; TROP= Degree of Trade Openness; μ =Stochastic disturbance or error term; β_0 = constant term (the intercept); β_1- β_4 = coefficients of the explanatory variables.

3.2. Estimation Technique and Procedure

The estimation technique adopted in this study is Ordinary least square method. Before carrying out the technique, unit root test, using Augmented Dickey Fuller was conducted to ascertain that the variables are stationary. Then, cointegration test was carried out to know whether there is long run relationship among the variables in the model. The ordinary least square method was applied to check for the relationship between economic growth (the dependent variable) and the independent variables listed above. The OLS method is widely adopted as an analytical tool for statistical or econometric researches because it operates under certain assumptions that describe it as the Best Linear Unbiased Estimate.

3.3. Nature and Sources of Data

The data used in this research work has a range period of 1990-2021 (32 years) and are basically secondary data sourced from Reports and Bulletin of the National Bureau of Statistics (NBS), World Bank database, and Central Bank of Nigeria (CBN) Statistical Bulletin.

4. Data Presentation and Analyses

4.1. Descriptive Statistics

The descriptive statistics helps to understand times series data and its properties. It shows the mean, median, mode, standard deviation, skewness, and kurtosis. The descriptive statistics of the study is presented in Table 1

Table 1: Summary of Descriptive Statistics Result

	GDP	GFCF	INVA	LFP	TROP
Mean	11.19793	10.61310	9.759328	58.57446	-0.450430
Median	11.31104	10.69236	8.957096	59.91500	-0.423825
Maximum	11.75891	11.16420	11.15076	61.21000	-0.257587
Minimum	10.44404	10.09143	8.608227	53.91000	-0.786424
Std. Dev.	0.438435	0.291521	1.135846	2.485405	0.126566
Skewness	-0.214173	-0.016337	0.240548	-0.735901	-0.784917
Kurtosis	1.411060	1.841808	1.102167	1.793421	2.135038
Jarque-Bera	3.610947	1.789968	5.110967	4.829382	3.310154
Probability	0.164397	0.408614	0.077655	0.089395	0.191077
Sum	358.3338	339.6193	312.2985	1874.383	-14.41376
Sum Sq.Dev.	5.958975	2.634527	39.99453	191.4943	0.496589
Observations	32	32	32	32	32

Source: Researcher's computation using E-views 10

Table 1 shows the result of the descriptive statistics which examined the normality of the variables of the study and the time series properties within the period under study. The mean values of all the variables showed the average values of the variables over the years which incidentally lied between the maximum and minimum values. The values of the standard deviation revealed the measure of variability of the variables from their respective long-term mean values every year.

The skewness values show that GDP, GFCF, LFP AND TROP were negatively skewed, implying lower values than their sample mean values. On the other hand, INVA was positively

skewed, implying higher values than its mean value. However, it is worthy to note that GDP and GFCF were approximately, normally skewed, implying that the distribution is symmetric around its mean value and the skewness value are approximately zero.

Kurtosis measures the peakness or flatness of the distribution of the series. A distribution with a value of approximately 3 is termed mesokurtic distribution and it suggests a normal distribution; a value higher than 3 is termed leptokurtic (positive kurtosis), suggesting that the distribution is a peaked-curve, having more higher values than the sample mean and a value smaller than 3 is termed platykurtic (negative kurtosis), suggesting that the distribution is a flatted-curve, having more lower values than the sample mean. Thus, from the table, all variables are platykurtic, having more lower values than their sample mean values.

4.2. Stationarity Test

The study test for stationarity using Augmented Dickey-Fuller (ADF) tests on the data and the result is presented in Table 2.

Table 2: Summary of ADF Unit Root Test

Null Hypothesis: the variable has a unit root

		At Level				
		GDP	GFCF	INVA	LFP	TROP
With Constant	t-Statistic	-0.5141	0.3909	-0.5130	-1.1300	-2.3424
	Prob.	***0.8753***	***0.9793***	***0.8755***	***0.6905***	***0.1658***
		n0	n0	n0	n0	n0
With Constant & Trend	t-Statistic	-1.3509	-3.3720	-2.0175	-2.5830	-3.0290
	Prob.	***0.8554***	***0.0743***	***0.5693***	***0.2899***	***0.1408***
		n0	*	n0	n0	n0
Without Constant & Trend	t-Statistic	1.6687	1.5961	1.0550	-1.4647	-0.3377
	Prob.	***0.9741***	***0.9701***	***0.9199***	***0.1311***	***0.5553***
		n0	n0	n0	n0	n0
		At First Difference				
		d(GDP)	d(GFCF)	d(INVA)	d(LFP)	d(TROP)
With Constant	t-Statistic	-4.2901	-4.1504	-5.3808	-3.6686	-6.8588
	Prob.	***0.0021***	***0.0030***	***0.0001***	***0.0100***	***0.0000***
		***	***	***	**	***
With Constant & Trend	t-Statistic	-4.2244	-4.2526	-5.3238	-3.6005	-6.8763
	Prob.	***0.0118***	***0.0111***	***0.0008***	***0.0468***	***0.0000***
		**	**	***	**	***

Without Trend	Constant &	t-Statistic	-3.8133	-3.8416	-5.2369	-3.5628	-6.9368
		Prob.	***0.0004***	***0.0004***	***0.0000***	***0.0009***	***0.0000***
			***	***	***	***	***

Source: Researcher's Computation using E-Views 10

Notes:
a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

Evidence from the unit root tests in Table 1 shows that all the variables: GDP, GFCF, LFP and TROP were stationary at the first difference, since the decision rule is to reject the null hypothesis if the probability value is ≤ 5%.

4.3. Johansen Cointegration Test

Having obtained stationarity at first difference, the Johansen approach to co-integration test can now be conducted as this meets the condition under which the test could be applied. The result is presented in Table 3.

Table 3: Summary of Co-integration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.682681	74.56028	69.81889	0.0099
At most 1	0.497275	40.12485	47.85613	0.0081
At most 2	0.325253	19.49348	29.79707	0.0179
At most 3	0.169268	7.690963	15.49471	0.0390
At most 4	0.068461	2.127527	3.841466	0.0447

Source: Researcher Computation using E-Views 10

Given the results generated, the trace test indicates one cointegrating equations at the 0.05 level of significance. This denotes that the null hypothesis of no cointegrating equation is rejected at

0.05 level of significance. Thus, we conclude that a long run relationship exists among the variables.

4.4 Ordinary Least Squares (OLS) Result

The study subjects the model to ordinary least square to generate the coefficients of the parameters of the regression model. The result is summarized in Table 4.

Table 4: Ordinary Least Square (OLS) Result

Dependent Variable: GDP
Method: Least Squares
Date: 04/26/23 Time: 13:52
Sample: 1990 2021
Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.333246	0.115304	4.209013	0.003
INVA	0.073092	0.004061	161.2829	0.0171
LFP	0.028332	0.001860	172.3188	0.0230
GFCF	0.320513	0.001939	530.0447	0.0205
TROP	0.451822	0.009065	47.45273	0.0058

R-squared	0.946120	Mean dependent var	0.492500
Adjusted R-squared	0.938138	S.D. dependent var	0.033522
S.E. of regression	0.019048	Akaike info criterion	-4.053168
Sum squared resid	0.031069	Schwarz criterion	-3.824147
Log likelihood	56.22332	Hannan-Quinn criter.	-3.977254
F-statistic	3.125286	Durbin-Watson stat	1.847467
Prob(F-statistic)	0.033091		

Source: Researcher's Computation using E-Views 10

The OLS results show the relationship between gross domestic product (GDP) and several independent variables, including industry value added (INVA), labor force participation rate (LFP), gross fixed capital formation (GFCF), and trade openness(TROP).The coefficients of these variables indicate the magnitude and direction of their impact on GDP.

The intercept, represented by the coefficient of the constant term C, is 0.333246. This means that even when all other independent variables are equal to zero, GDP growth rate is expected to be 0.333246.

The coefficient of INVA is 0.073092, which means that a one-unit increase in INVA leads to a 7.3% increase in GDP. Similarly, a one-unit increase in LFP leads to a 2.83% increase in GDP, while a one-unit increase in GFCF leads to a 0.320513 increase in GDP.The study showed that industry value added has a positive and statistical significant impact on economic growth in Nigeria. This implies that a rise in industry value added, increases economic growth in Nigeria and vice versa under the period reviewed. The positive relationship between industrial sector and economic growth supports the findings of Nora et al. (2022) which also established a positive relationship between industrial sector and economic growth in Nigeria.

The study indicated that labor force participation rate has a positive and statistical significant impact on economic growth in Nigeria. This implies that a rise in labor force participation rate will increase economic growth in Nigeria and vice versa under the period reviewed. The implication of the finding also showed that a 1% increase in labor force participation rate will lead to 0.028 or 2.8% increase in economic growth in Nigeria. This finding also corroborates the findings of Nora et al. (2022).

The study also revealed that gross fixed capital formation has a positive and statistical significant impact on economic growth in Nigeria. This implies that a rise in gross fixed capital formation, increases economic growth in Nigeria and vice versa under the period reviewed. The implication of the finding is that a 1% increase in gross fixed capital formation will lead to 0.32 or 32% increase in economic growth in Nigeria. This positive relationship supports the findings of Nora et al. (2022).

The coefficient of TROP is 0.451822, indicating that a one-unit increase in TROP results in a 0.451822 increase in GDP. The t-statistic and p-value of each coefficient suggest that they are statistically significant at a 5% level of significance.The study disclosed that trade openness has a positive and statistical significant impact on economic growth in Nigeria. This finding also supports the findings of Nora et al. (2022).

The R-squared value of 0.946120 suggests that the independent variables explain 94.61% of the variation in GDP, while the adjusted R-squared value of 0.938138 indicates that the model is a good fit. The F-statistic of 3.125286 has a p-value of 0.033091, indicating that the overall model is statistically significant at a 5% level of significance. The Durbin-Watson statistic of 1.847467 indicates that there is no significant autocorrelation in the residuals.

5. Conclusion and Policy Recommendations

Conclusion

This study examines the impact of industrial sector on Nigeria economy, using time series data spanning from 1990 to 2021. The OLS technique of analysis was adopted and the findings from the study reveal that all the variables are positive and statistically significant with economic growth in Nigeria. The conclusion from this study therefore, is that the positive coefficient of all variables used is indicative of the fact that Industry value added, labour force participation rate, gross fixed capital formation and trade openness in Nigeria within the period under review ended up being appropriated.

Policy Recommendations

Given the above findings, we recommend that government should implement policies that will enhance industrial development in Nigeria. Specifically, we recommend that government should create enabling environment that will attract investments in the critical sectors of our industries. More so, there should be expansion and utilization of the nation`s industrial capacity that is currently under-utilized in order to avoid idle human and material resources. This will ensure that more labour will be employed thereby reducing the problem of unemployment. There should also encouraged capital formation to induce investment.

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