INDUSTRIAL DEVELOPMENT AND POVERTY REDUCTION: AN EMPIRICAL ASSESSMENT OF THE NIGERIAN HUMAN CAPITAL DEVELOPMENT

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Abstract

Nigeria's high poverty rate might be linked to the country's failure to develop its industrial sector over the past years. Against this background, this study examined the influence of industrial expansion on poverty reduction in Nigeria. Data from, 1990 to 2021 were estimated using completely modified ordinary least squares method and Pairwise Granger causality respectively. According to the study's findings, manufacturing value added and human capital development are inversely related in Nigeria but statistically not significant. This is an indication that industrial development has a less capacity to reduce poverty in Nigeria, which is contrary to the aprori expectation. The deficiency in industrial development in Nigeria might account for this result. Furthermore, there is no causal link between industrial value added and the human development index. This implies that the current level of industrial development in Nigeria could not reduce poverty in the country. Based on these findings, the study recommends for the Nigerian policymakers, among other things, that policies and programme

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that would drive industrial expansion should be embarked upon in the country, this would boost job creation, output growth, and eventually eliminate poverty in the country.

Keywords: Manufacturing Value Added; HDI; Poverty; Nigeria

1.   Introduction

Industrialization has a huge influence on employment, growth, and poverty eradication in developing countries (Aderemi *et al.,* 2022; Olanipekun *et al.,* 2022). When a developing country transforms from an agricultural to a modern economy, the manufacturing sector frequently has a better capacity to absorb more workers than the services sector, which is dominated by informal services in the average low-income country. It has been stated that a strong and effective industrial sector has a significant impact on raising and maintaining the standard of living for families and communities worldwide. This is mostly due to the fact that greater industrial investment has a multiplier impact on the economy as a whole, which may raise the GDP, generate jobs, and lower the degree of poverty.

The term "poverty" refers to a condition of total economic hardship in which a person cannot independently meet basic needs for clothing, food, security, and shelter. Poverty, according to Hussain *et al.* (2017), is described as a lack of products or income, as well as a lack of competence, confidence, empowerment, and access to national currency. According to a World Bank forecast of poverty in Nigeria (2022), up to four out of every ten Nigerians are estimated to be living below the poverty level. Particularly in the north of the country, many Nigerians lack access to basic necessities like power, potable water, and proper sanitary facilities. Only 17 percent of Nigerian workers have wage employment that can help individuals escape poverty, according to their research, which also shows that jobs do not help Nigerians who work hard to escape poverty. Instead, the bulk of employees work in small-scale domestic farm and non-farm businesses. Poverty exists in several dimensions, which might be based on socioeconomic and political factors. As a result, it may include all types of poverty, including generational, absolute, relative, and situational poverty. Poverty, however, can be either absolute or relative. Abject poverty, often referred to as extreme poverty, is the inability to meet basic needs for things like food, clean water, health, shelter, education, and information. This is the most common sort of poverty in emerging nations. Relative poverty, on the other hand, is the inability to meet the standardized economic status in a certain social setting, resulting in social exclusion. It is commonly used to calculate poverty rates in affluent or developed countries with a high level of industrialization.

Underdeveloped nations, such as Nigeria have the worst living conditions and the most severe poverty in the entire world, placing them at the bottom of the economic scale. For example, Nigeria was recently named the African country with the poorest population. 736 million, according to World Bank research, dwell in abject poverty, making $1.90 or less a day. Furthermore, it was claimed that half of the 736 million people who live in extreme poverty worldwide reside in only five countries: Bangladesh, Ethiopia, the Democratic Republic of the Congo, Nigeria, and India. In spite of this, 85% of the world's impoverished are found in South Asia and Sub-Saharan Africa. Nigeria now ranks among the world's poorest nations. Furthermore, Nigeria is characterized by wide discrepancies, particularly in income. This disparity has an impact on people's life, everyday interactions, capacities, chances of success, and empowerment, as well as their living conditions. Nigeria's high poverty rate might be linked to the country's failure to develop fast industrialization throughout the years. In order to build the industrial sector, Nigeria went through five phases of industrialization in succession. The post-civil war economy (1970–1975), the oil boom (1975–1983), the Structural Adjustment Programme (SAP) in 1986, and the Economic Liberalisation phase (1999) are the stages of post–independence history that Dagogo (2014) outlines. However, the trajectory of industrial contribution to national production has fluctuated since independence in 1960. For example, the average annual manufacturing production in 1980, 1990, 2000, and 2010 was $13.72 billion, $8.88 billion, $20.37 billion, and $42.14 billion, respectively (National Bureau of Statistics, 2020).

According to the Nigeria Poverty Profile Report by National Bureau of Statistics (2010), Aluko (2003), and Dauda (2006), among others, the federal government and its state equivalents have developed several strategies and implemented initiatives and policies to encourage industrialization and reduce poverty in the country. Nigeria's Vision 20, the Directorate of Employment (NDA), the National Poverty Eradication Programme (NAPP), the New Economic Empowerment and Development Strategy (NEEDS), the Seven Point Agenda, the National Accelerated Food Production Programmes, the establishment of Industrial Development Centres, the Indigenization Policy, Integrated Rural Development (IRD), Operation Feed the Nation, and The Green Revolution are a few of these programmes. Too bad the intended outcomes of these programmes and approaches haven't materialized. Their failure may be attributed mostly to corruption and ineffective execution. Industrial production in Nigeria is still small, and poverty is ubiquitous. Using the World Bank's $1.9 poverty level, the poverty rate approaches 50%. As a result, the country is now known as the "World Capital of Poverty".

There is very few prior research on the relationship between industry and poverty. To the best of our knowledge, no studies have been done on the relationship between poverty and industrialization in Nigeria. This demonstrates that this investigation is vital. Despite the claims made by Lavopa and Szirmai (2012), Athokorala and Sen (2015), and Islam (2004), industrialization has been shown to significantly reduce poverty by generating jobs. However, the research was conducted using old and non-current data. This study aims to address the gap by exploring how industrial expansion affected the decline in poverty in Nigeria between 1990 and 2022.

This introduction is followed by a review of relevant literature in part two and a discussion of materials and methods in part three. Part five of the study presents a few recommendations for more research after Part 4 of the study examines the empirical results.

2. Literature Review

Bennett et al. (2015) utilized the Ordinary Least Square method to analyze the impact of industrial development on Nigeria's economic growth from 1973 to 2013. The analysis's findings revealed that although industrial production influences economic growth favorably, this relationship is not statistically significant. The positive and significant influence that savings have on Nigeria's economy was also demonstrated. The relationship between inflation and economic growth is inverse, but the relationship between foreign direct investment and growth is substantial and positive. The findings suggest that in order to support the industrialization of the Nigerian economy and bolster GDP, the government and its agencies should ensure political stability, put in place strategic policies that will level the playing field for foreign investors, and encourage the establishment of industries, particularly manufacturing industries. Increased savings will boost the economy's access to capital through high interest rates and monetary policy changes to income. With Nigeria's distinct environment and conditions, the Bank of Industry (BOI) need to be ready to support the country's industrialization along its economic trajectory rather than adopting strategies that have proven successful outside.

The Economic Community of West Africa (ECOWAS) Experience member nations (2000–2013) that Jelilov, Enwerem, and Abdurahman studied were the Republic of Nigeria, Benin Republic, Cabo Verde, Cote D'voire, The Gambia, Ghana, Guinea Bissau, Mali, Niger, and Senegal. The study aimed to address three principal queries: what is the relationship between government spending and industry growth? What is the impact of fiscal and monetary policy on GDP? And how do investments and

job growth relate to the budget? Only secondary data from the National Bureau of Statistics and Central Bank of Nigeria's 2014 statistics bulletins were utilised in the study. GDP was the dependent variable in the study's useful model, while the independent variables were industrial production, foreign direct investment, interest rate, foreign exchange rate, and inflation rate. The F-test and the Ordinary Least Square (OLS) method were used in the study. The paper claims that industrialization has a negative impact on Nigeria's long-term economic growth. The outcome of the F-test supported this.

In their research "The influence of industrialization on economic growth: Experience of 10 nations in ECOWAS during the decades of (2000-2013)", Gylych et al. (2016) found that industrialization has a long-term detrimental impact on economic growth in Nigeria. The Ordinary Least Squares (OLS) technique was the name of the methodology used. Because their findings revealed an increase in exchange and inflation rates, as well as a decline in output, the researchers advised the government to refocus its industrial and investment policies in order to boost real GDP, maintain a flexible exchange rate, and control inflation. Furthermore, in order to boost productivity and GDP, industrial and investment strategies should be adaptable to new industries.

Baghebo and Emmanuel (2015) looked into how Nigeria's economic development changed as a result of reducing poverty from 1981 to 2013. Using the ARDL bounds testing approach for cointegration, the researchers discovered that increasing government expenditure decreases poverty and increases GDP, a critical indication of economic progress.

From 1980 to 2011, Nindi and Odhiambo (2015) explored the relationship between poverty reduction and Swaziland's economic success. They tested cointegration using the autoregressive distributed lag (ARDL) bounds testing approach. According to the data, economic development neither temporarily nor permanently reduces poverty. Granger, on the other hand, promotes economic growth through poverty alleviation.

From 1980 to 2013, Gangas (2017) examined the link between economic development and poverty alleviation in Nigeria. The findings of the ordinary least squares (OLS) estimator revealed that poverty alleviation is detrimental to economic growth.

In 26 Brazilian States between 1980 and 2015, Nakabashi (2018) examined how poverty affected economic growth. The results showed that reducing poverty is

critical for enhancing economic development when using the ordinary least square (OLS) estimator with robust standard errors.

Eneji *et al.* (2020) investigated the performance of Nigeria's industrial sector and efforts to reduce poverty using time series data that covered the years 1981–2018. The study employed econometric approaches such as the Granger causality test, Ordinary Least Squares (OLS), and multiple regressions. According to the estimated regression result, both aggregate industrial employment (INDEM) and production (INDQ) had a positive impact on poverty reduction in Nigeria. According to the Granger causality test, aggregate industrial output (INDQ) caused aggregate industrial employment (INDEM), and poverty rate (POVR) caused aggregate industrial employment (INDEM). All of these connections demonstrated unidirectional causation. The report suggests that Nigeria's government put in place the necessary mechanisms to guarantee that budgetary allocation to the industrial sector is raised for proper industrialization in order to intentionally enhance Gross Domestic Product (GDP) through greater industrial production. To prevent funds from being stolen or diverted by government personnel, government programs to reduce poverty should be enhanced and appropriately funded with good coordination. To ensure that unfinished industrial projects are funded and properly industrialized, the government should take the initiative to maintain consistency and continuity in its industrial strategy. The government, in collaboration with the private sector, should take technological development in the Nigerian industrial sector very seriously in order to face head-on the problems of antiquated, ineffective technology.

Emanuella *et al*. (2018) looked into how measures to combat poverty were impacted by Nigeria's economic progress. To examine the effects and interactions in the poverty-growth nexus in Nigeria, the study simulated a number of carefully chosen macroeconomic variables, such as consumption, per capita income, illiteracy rate, mortality, population, poverty, unemployment, and life expectancy. According to the data, Nigeria's poverty, unemployment, mortality rate, consumption, and GDP all had a substantial effect and link. The following recommendations are offered in light of the study's findings: Nigerian poverty reduction initiatives must be practical and measurable by concentrating on the perceived requirements and degree of employment of the population. Supervised capacity building is crucial both before and during the execution of the programs. This will assist in resolving the unemployment problem brought on by the collapse of enterprises receiving government backing. It is the leadership's responsibility to cultivate a strong sense of nationalism and patriotism, which will be reinforced by high levels of mutual

trust, stability, and development that will permit accountability, transparency, and openness—all of which will eventually contribute to the expansion of the economy and the reduction of poverty. Sustained expenditure on human capital, such using ICT to educate underprivileged students, may increase output, provide new job possibilities, draw in capital, and raise family income standards. Governments should also make a concerted effort to develop basic human welfare, such as health and social infrastructure, in order to progressively reduce the high incidence of child mortality and raise the standard of living.

3. Methodology

The primary purpose of this research is to look at how industrial expansion influences poverty reduction. This study conducts its analysis using secondary data from 1990 to 2022. The World Development Indicator (WDI) was used to collect data for the human development index, manufacturing value added, gross fixed capital formation, total money supply, and foreign direct investment. E-Views software was used to analyze the data.

Model Specification

In order to achieve the research objectives, two models are specified in this research work. These models are denoted by Model 1 and Model 2. Model 1 examines the extent to which industrial development impacts poverty alleviation in Nigeria, while Model 2 examines the causality between industrial development and poverty alleviation.

Model (1)

Following Aderemi *et al.* (2021: a), Olowookere *et al.* (2022) and Aderemi *et al.* (2021: a), the adapted form of the model can be written as follows:

$$HDI = F\ (MVA,\ GFCF,\ BMS,\ FDI) \tag{1}$$

The econometric model for this equation is;

$$LnHDI_t = \alpha + \beta_0 LnMVA_t + \beta_1 LnGFCF_t + \beta_2 LnBMS_t + \beta_3 LnFDI_t + \mu_i \tag{2}$$

Where;　　　　HDI = Human Development Index

　　　　　　　MVA = Manufacturing Value Added

　　　　　　　GFCF = Gross Fixed Capital Formation

　　　　　　　BMS = Broad Money Supply

FDI = Foreign Direct Investment

α = Intercept of the Model

β_0, β_1, β_2, β_3 = Coefficient of Parameters

U = Error Term

HDI = Dependent Variable

MVA, GFCF, BMS and FDI = Independent Variables

f = Functional Notation

Model (2)

Following Lawal *et al*. (2022), Opele *et al*. (2022), granger causality model is specified below to examine the causal relationship that exits among the key variables of interest in the study.

$MVA_t = \beta_0 + \sum_{i=1}^{m} \beta_1 MVA_{t-i} + \sum_{j=1}^{n} \beta_2 HDI_{t-j} + \sum_{k=1}^{O} \beta_3 GFCF_{t-k} + \sum_{l=1}^{P} \beta_4 BMS_{t-l} + \sum_{m=1}^{q} \beta_5 FDI_{t-l} + \mu_{1t}$

$HDI_t = \alpha_o + \sum_{i=1}^{m} \alpha_1 HDI_{t-i} + \sum_{j=1}^{n} \alpha_2 \quad GFCF_{t-j} + \sum_{k=1}^{O} \alpha_3 BMS_{t-k} + \sum_{l=1}^{p} \alpha_4 FDI_{t-l} + \sum_{m=1}^{q} \alpha_4 MVA_{t-l} + \mu_{2t}$

$GFCF_t = \gamma_0 + \sum_{i=1}^{m} \gamma_1 GFCF_{t-i} + \sum_{j=1}^{n} \gamma_2 BMS_{t-j} + \sum_{k=1}^{O} \gamma_3 FDI_{t-k} + \sum_{l=1}^{p} \gamma_4 MVA_{t-k} + \sum_{m=1}^{q} \gamma_4 HDI_{t-k} + \mu_{3t}$

$BMS_t = \delta_0 + \sum_{i=1}^{m} \delta_1 BMS_{t-i} + \sum_{j=1}^{n} \delta_2 FDI_{t-j} + \sum_{k=1}^{O} \delta_3 MVA_{t-k} + \sum_{l=1}^{p} \delta_4 HDI_{t-l} + \sum_{m=1}^{q} \delta_4 GFCF_{t-l} + \mu_{4t}$

$FDI_t = \lambda_0 + \sum_{i=1}^{m} \lambda_1 FDI_{t-i} + \sum_{j=1}^{n} \lambda_2 MVA_{t-j} + \sum_{k=1}^{O} \lambda_3 HDI_{t-k} + \sum_{l=1}^{p} \lambda_4 GFCF_{t-l} + \sum_{m=1}^{q} \lambda_4 BMS_{t-l} + \mu_{4t}$

A Priori Expectation

α, β_0, β_1, β_2, β_3, > 0

As stated in the above equation, it is expected that manufacturing value added (β_0), gross fixed capital formation (β_1), broad money supply (β_2), foreign direct investment (β_3) will have a negative effect on poverty rate.

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4. Result and Analysis

Table 1. Descriptive Statistics of Annual Data Series (1990-2022)

	MVA	HDI	GFCF	BMS	FDI
Mean	12.55810	0.474029	2.153386	18.40730	1.598208
Median	11.66709	0.475500	2.978241	17.59603	1.487050
Maximum	20.92708	0.539000	40.74386	27.37879	5.790847
Minimum	6.552817	0.400000	-22.79282	9.063329	-0.039128
Std. Dev.	4.368545	0.045619	12.23211	5.999655	1.227738
Skewness	0.473092	0.005973	0.440263	-0.020845	1.733335
Kurtosis	1.865659	1.575475	5.058369	1.351214	6.525936
Jarque-Bera	2.909322	2.705887	6.682944	3.626978	32.60004
Probability	0.233479	0.258478	0.035385	0.163084	0.000000
Sum	401.8593	15.16893	68.90837	589.0335	51.14265
Sum Sq. Dev.	591.6098	0.064513	4638.363	1115.872	46.72756
Observations	32	32	32	32	32

Source: Authors` Computation (2023)

The table above shows the results of the descriptive statics of the estimated data set. This test is used to check if the data set complies with the assumption of a normal distribution. The results indicated that the human development index, broad money supply, manufacturing value added, and foreign direct investment are all bigger than their corresponding standard deviations. This indicates that the data set is a little out of proportion to the mean. The standard deviations of gross fixed capital creation are greater than the mean. As a result, it seems that the data set is significantly skewed against the mean. Furthermore, the manufacturing value added, human development index, gross fixed capital formation, and foreign direct investment all have positive skewness values. However, only the manufacturing value added, human development index, and broad money supply have kurtosis values that are close to 3. Gross fixed capital formation and foreign direct investment are far from the assumed value of 3, so they don't fit the criteria. Since some of the data were in accordance with the symmetrical distribution assumption, these data may be used in future econometric studies.

Table 2. Unit Root Test

Variables	ADF Test		
	Level	1st Diff.	Remarks
MVA	-2.957110	-2.960411	I (1)
HDI	-2.971853	-2.971853	I (1)
GFCF	-2.960411	-	I (0)
BMS	-2.957110	-2.960411	I (1)
FDI	-2.957110	-2.963972	I (1)
Variables	PP Test		
	Level	1st Diff.	Remarks
MVA	-2.957110	-2.960411	I (1)
HDI	-2.963972	-2.971853	I (1)
GFCF	-2.957110	-	I (0)
BMS	-2.957110	-2.960411	I (1)
FDI	-2.957110	-2.960411	I (1)

Source: Authors` Computation (2023)

The stationarity issue with the time series data cannot be completely eliminated, as this could produce absurd or meaningless results. This study examined the stationarity of the data using the standard Augmented Dickey- Fuller (ADF) and Phillips Perron (PP) tests in order to solve the previously described problem. A mixture of I (0) and I (1) make up the variables' adopted data set, as table 2's result illustrates. This indicates that the variables are a combination of data that are level and first difference stationary. This merely indicates that different integration orders were combined with the data, which may have implications for the variables' short-term divergence. On the other hand, over time, the degree of divergence might revert to equilibrium. To investigate the long-term correlation between the variables, a co-integration test was used.

Table 3. Johansen Cointegration Test (Trace Statistics) and (Maximum Eigenvalue)

Hypothesised No. of CE(s)	Eigen value	Trace Statistics	Prob.	Max-Eigen Statistic	Prob.
None*	0.838329	109.8390	0.0000	51.02144	0.0002
At most 1*	0.711800	58.81761	0.0034	34.83482	0.0049
At most 2*	0.363516	23.98279	0.2012	12.65028	0.4849
At most 3*	0.299420	11.33251	0.1919	9.963698	0.2143
At most 4*	0.047710	1.368811	0.2420	1.368811	0.2420

Source: *Authors` Computation (2023)*

The table above showed the estimated result from the long run relationship between the variables after using the Johansen co-integration test. It could be deduced that the at least four co-integration vectors existed among the variables.

Table 4. Impact of Industrial Development on Poverty Reduction in Nigeria (1990-2022)

Dependent Variable: Human Development Index

Variable	Coefficient	t-Statistic	Prob.
MVA	-0.002087	1.584499	0.1252
GFCF	0.000257	0.689105	0.4969
BMS	0.005238	5.373711	0.0000
FDI	-0.009485	2.532621	0.0177
C	0.420168	13.00920	0.0000
R-squared			
Adjusted R-squared	0.815924		
	0.787604		

Source: Authors` Computation (2023)

The table above displays the results of the completely modified ordinary least square regression. The model's explanatory variables explained 81% of the systematic fluctuations in the dependent variable, the human development index, and the other 19% were the result of random chance. The model used is relatively good for this study. Upon accounting for the reduction in degree of freedom, the explanatory power decreased to 78%. Value addition in manufacturing and human capital development are inversely related in Nigeria but statistically not significant. Every unit change in manufacturing value added results in a 0.002% reduction in the proportion of the human development index. This is an indication that industrial development has a less capacity to reduce poverty in Nigeria, which is contrary to the aprori expectation. The deficiency in industrial development in Nigeria might account for this result.

Furthermore, the human development index and gross fixed capital formation have a favorable but insignificant relationship. This means that for every unit change in gross fixed capital creation, the country's human development index rises by 0.00025%. Conversely, there is a statistically significant positive relationship between the broad money supply and the human development index. Every unit change in the money supply results in a 0.005% increase in the nation's human development index. Not only does foreign direct investment negatively affect Nigeria's human development index, but its effect is statistically significant.

Table 5. Pairwise Granger Causality between Poverty Alleviation and Industrial Development in Nigeria

Null Hypothesis:	Obs	F-Statistic	Prob.
HDI does not Granger Cause MVA	28	1.54734	0.2342
MVA does not Granger Cause HDI		2.19599	0.1340
GFCF does not Granger Cause MVA	31	0.26075	0.7725
MVA does not Granger Cause GFCF		0.15913	0.8537
BMS does not Granger Cause MVA	31	2.68830	0.0869
MVA does not Granger Cause BMS		2.88220	0.0740
FDI does not Granger Cause MVA	31	0.14135	0.8688
MVA does not Granger Cause FDI		5.35268	0.0113
GFCF does not Granger Cause HDI	28	1.06079	0.3625
HDI does not Granger Cause GFCF		0.00912	0.9909
BMS does not Granger Cause HDI	28	0.21260	0.8101
HDI does not Granger Cause BMS		4.07788	0.0305
FDI does not granger cause HDI	28	0.33861	0.7163
HDI does not granger cause FDI		4.60894	0.0207
BMS does not granger cause GFCF	31	0.52275	0.5990
GFCF does not granger cause BMS		1.93881	0.1641
FDI does not granger cause GFCF	31	0.25230	0.7789
GFCF does not granger cause FDI		0.16871	0.8457
FDI does not granger cause BMS	31	1.92045	0.1668
BMS does not granger cause FDI		1.91296	0.1679

Source: Authors` Computation (2023)

The findings of Pairwise Granger Causality are displayed in the table above. It demonstrates the one-sided relationship that exists between FDI and industrial value addition. The broad money supply and the human development index in Nigeria have a one-way relationship. Foreign direct investment and the human development index are also one-way causally related. Furthermore, there is no link between industrial value added and the human development index.

5.   Summary, Recommendation and Conclusion

From 1990 through 2021, this study examined the influence of industrial expansion on poverty reduction in Nigeria. The Augmented Dickey Fuller and Phillips Perron tests were performed to determine the degree of stationarity in the data set, and descriptive statistics were employed to assess the normal distribution's validity. To examine the data's convergence over the short and long term, the Johansen Cointegration test was performed. The completely modified ordinary least squares

method was used to examine the influence of industrial growth on poverty reduction in Nigeria. Pairwise Granger causality was used to determine the direction of causation between the variables in the research. According to the study's findings, manufacturing value added and Nigeria's human development index are adversely connected and statistically insignificant. Furthermore, there is no link between industrial value added and the human development index. This implies that the current level of industrial development in Nigeria could not reduce poverty in the country. Based on these findings, the study recommends for the Nigerian policymakers, among other things, that policies and programme that would drive industrial expansion should be embarked upon in the country, this would boost job creation, output growth, and eventually eliminate poverty in the country.

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