INTERNATIONAL JOURNAL OF WOMEN IN TECHNICAL EDUCATION AND EMPLOYMENT (IJOWITED)

International Journal of Women in Technical Education and Employment
ISSN: 2811-1567. Volume 5 – Issue 1. July 2024
https://fpiwitedjournal.federalpolyilaro.edu.ng

Driving Economic Prosperity through the Influence of Industrialization: Evidence from Nigerian Economy

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ARTICLE HISTORY

Received: May 31, 2024
Revised: June 12, 2024
Accepted: June 19, 2024

Abstract

This study examines the relationship between industrialization and economic growth in Nigeria from 1981 to 2020, with a specific focus on variables such as Gross Domestic Product (GDP), industrial output, Foreign Direct Investment (FDI), interest rates, and inflation rates. Data for this period were sourced from the Central Bank of Nigeria and the World Bank. Through a rigorous econometric analysis employing the Autoregressive Distributed Lag (ARDL) bound test, a significant long-term relationship among these economic indicators was established. The Error Correction Model (ECM) indicated that past GDP levels significantly affect economic growth, with a positive and statistically significant impact. However, industrial output and interest rates exhibited a negative influence on long-term economic growth, while the impact of FDI was minimal. In contrast, inflation demonstrated a positive effect. Granger causality tests suggested a bidirectional causality between industrial output and GDP, highlighting a reciprocal predictive relationship. The study achieved an R-squared of 0.708747, indicating that about 71% of the variations in GDP can be explained by the model's independent variables. Based on these findings, the study recommends enhancing the industrial sector, promoting foreign investment, and managing inflation effectively to foster sustainable economic growth.

Key words: *Foreign Direct Investment (FDI), Gross Domestic Product (GDP), industrial output, inflation rates, interest rates.*

Citation
Ogunsanwo, A. M.; Oyelekan, A. A. & Popoola, I. A. (2024). ODriving Economic Prosperity through the Influence of Industrialization: Evidence from Nigerian Economy. *International Journal of Women in Technical Education and Employment*, 5(1), 170 – 182.

Introduction

Economic growth is intricately tied to the progressive fulfillment of essential needs and the advancement of various sectors crucial for providing goods and services. A pivotal aspect of this advancement is industrialization, which is marked by the comprehensive use of machinery, extensive wage labor, and high production levels facilitated by advanced technologies and labor division. Tsuwa (2011) defines industrialization as a process characterized by the establishment of robust transportation and communication systems, a formal education framework, and organizational bureaucratization. This systematic development is crucial for transitioning an economy from primary production to a more diversified industrial base, reflecting a significant shift in economic structure and capacity.

Modern industrialization processes involve the transformation of raw materials into finished products, effectively utilizing information and resources to

optimize production and market operations. This transformation is integral to economic growth as it enhances productivity, generates employment, and fosters regional development, thereby reducing poverty and advancing technological innovation (Effiom & Udah, 2014). The role of industrialization in economic development has become a central focus of policy and scholarly attention due to its profound impacts on environmental, economic, and social spheres (David, 2015).

The relationship between industrialization and economic growth is not merely correlational but causal, with each phase of industrial advancement playing a critical role in defining the economic milestones of a nation. As industries evolve, they catalyze structural changes that contribute to a broader economic transformation from an agrarian to an industrial and eventually to an information-driven economy. This evolution is predominantly driven by technological advancements, particularly in the dissemination of information (Stewart, 2012).

Given these dynamics, industrialization is not just a contributor to economic growth but a necessary condition for sustainable development. It demands a well-coordinated policy framework that strategically allocates resources to productive industrial activities, ensuring a continuous and balanced growth trajectory. Thus, understanding the mechanisms and impacts of industrialization is crucial for devising effective strategies that support long-term economic stability and growth.

Industrialization marks a significant transformation in an economy's structure, shifting from agriculture-based activities to manufacturing and service-oriented industries. This shift is crucial for economic diversification, which reduces a country's vulnerability to external shocks and enhances economic stability. According to Opoku & Yan (2018), industrialization significantly boosts economic growth by fostering a more diverse economic base and creating more stable employment opportunities. This diversification is enhanced by trade openness, which further propels industrial sectors.

Industrialization is intrinsically linked to technological advancement. As economies industrialize, they often adopt new technologies that increase productivity. These advancements are not only limited to manufacturing processes but also include improvements in logistics, communication, and infrastructure, which support industrial activities and contribute to broader economic growth. Franck & Galor (2015) discuss how regions that experienced early industrialization benefited from rapid technological adoption, leading to significant economic advancements. However, they caution that without simultaneous investments in human capital, the long-term benefits of industrialization can be compromised, suggesting that the nature of technological change influences long-term economic trajectories

The environmental impact of industrialization is a critical aspect of its relationship with economic growth. As Cherniwchan (2012) points out, the shift from agricultural to industrial production typically results in increased pollution and environmental degradation, which can have deleterious effects on public health and the economy's sustainable growth. Effective management of environmental impacts is essential to ensure that industrialization contributes positively to sustainable economic development. The role of policy and governance in facilitating industrialization and deriving economic benefits from it cannot be overstated. Governments play a pivotal role in creating conducive environments for industrial growth through policies that encourage investment, protect property rights, and promote innovation. The governance framework must also include measures to mitigate the adverse effects of industrialization, such as pollution and inequality, to ensure inclusive economic growth.

Despite extensive scholarly focus on the nexus between industrialization and economic growth, critical gaps persist in the literature, particularly regarding the effects of industrialization on specific economic development criteria such as local production enhancement, rural

development, and employment opportunities within the context of Nigerian states. Previous research, including Adebosin & Toriola's (2019) study on economic growth and Kida's (2020) econometric analysis, predominantly concentrates on national-level impacts, often overlooking the granular influence at the state level. This oversight can lead to an underestimation of how industrialization affects diverse regions and sectors within Nigeria.

Moreover, there is a noticeable deficiency in survey-based research assessing the perceived impacts of industrialization on economic advancement from the perspectives of local stakeholders. Such research is crucial for understanding the subjective interpretations and community-specific impacts of industrialization, which can differ significantly from macroeconomic indicators and econometric models. The significance of addressing these gaps is underscored by the challenges currently facing Nigeria's industrial sector, including policy fluctuations between deregulation and regulation, the economic repercussions of recent recessions, and global pandemics. These factors have collectively contributed to industrial closures, unemployment, declining living standards, and deteriorated infrastructure, underscoring the urgent need for targeted economic policies.

This study aims to bridge these gaps by conducting a comprehensive analysis of the impact of industrialization on the Nigerian economy from 1981 to 2020, with a particular focus on local production development, rural advancement, and employment prospects. By examining these areas, the research seeks to provide a deeper understanding of industrialization's role in fostering economic development and informing policy decisions at both national and state levels.

The primary aim of this study was to investigate the relationship between industrialization and economic growth in Nigeria from 1981 to 2020. The specific objectives were to:

- analyze the patterns of industrialization components and GDP in Nigeria from 1981 to 2020.
- investigate the impact of industrial output (INDO) on GDP.
- evaluate the effect of foreign direct investment (FDI) on GDP.
- determine the relationship between interest rates and GDP.
- examine the influence of the inflation rate on GDP.
- ascertain the causal relationship between industrialization components and GDP.

This study enhances the understanding of economic mechanisms underpinning rural resilience and informs policy formulation to boost industrialization and economic growth. It provides a theoretical, conceptual, and empirical basis for future research in industrialization and economic development, covering the period from 1981 to 2020.

The review examines industrialization's relationship with economic growth, using GDP as a key indicator. Industrial output (INDO) measures the production within a country's industrial sector and indicates industrialization levels. High industrial output supports GDP growth. Foreign Direct Investment (FDI) enhances GDP by bringing capital, technology, and jobs (Hansen & Rand, 2006). Interest Rates (INR), set by central banks, influence borrowing costs and economic activity, affecting growth. The Inflation Rate (INFR) reflects price level changes; moderate inflation suggests growth, while high inflation or deflation can hinder it. GDP represents the total value of goods and services produced, indicating economic growth. The interconnectivity of the concepts plays a significant role in shaping the economic landscape, influencing everything from policy decisions to investment strategies.

The theoretical review explores the shift from agrarian to industrial economies, driven by mechanization and technological innovation, resulting in socio-economic changes and urbanization, and necessitating sustainable policies. Industrialization is key to economic development, typically increasing GDP and living standards. Classical Economic Theory (Smith, 1776;

Ricardo, 1817) highlights labor specialization and comparative advantage in manufacturing. Schumpeter (1942) emphasizes technological innovation and entrepreneurship. Rostow (1960) views industrialization as vital for sustained growth, while Lewis (1954) focuses on labor reallocation to industry. New Growth Theory (Romer, 1990; Lucas, 1988) underscores technological advancements and knowledge spillovers. Onwumere (2010) and Tsuwa (2011) highlight broader sectoral advancements. Environmental and social impacts are noted by Stewart (2012) and Brundtland (2017). Effiom & Udah (2014) discuss job creation and regional growth. Industrialization is essential for developing nations, impacting productivity and revenue (Ogbonna, 2014; Uzochukwu, 2018), despite challenges like policy inconsistency and economic instability (Uzochukwu, 2018).

The empirical review investigates the relationship between industrialization and economic growth through various studies. Ajidele and Ekpo (2014) emphasized the need to reassess Nigeria's industrial strategies due to under-utilization despite structural changes. Obioma et al. (2015) found that while industrial output positively influences economic growth, its impact was not statistically significant; however, savings and FDI positively contributed to growth. Iya *et al*. (2016).

Materials and Methods

This methodology provides a framework for analyzing the impact of industrialization on economic growth in Nigeria from 1981 to 2020, focusing on the interactions between industrial output, FDI, interest rates, inflation, and GDP. Data from the Central Bank of Nigeria and the World Bank were analyzed using descriptive and inferential statistics. Key econometric techniques included the Augmented Dickey-Fuller (ADF) test for stationarity, Cointegration Test to examine long-run relationships, and the Autoregressive Distributed Lag (ARDL) approach with Bounds testing for cointegration. An Error Correction Model (ECM) was used to capture both short-term and long-term dynamics, while Granger Causality Tests identified causal directions. Diagnostic tests, including heteroskedasticity, serial correlation LM and normality

confirmed a positive correlation between industrial output and economic growth from 2001 to 2013, advocating for government intervention to improve the investment environment.

King & Levine (2013) and Caprio & Demirguckunt (2017) highlighted the role of long-term finance in supporting industrialization. Okafor et al. (2019) showed that while industrialization boosts economic growth, it also poses environmental challenges, advocating for green technologies. Udi et al. (2020) demonstrated that industrialization positively impacts South Africa's economic growth, emphasizing the need for balanced FDI and resource management policies.

Chukwuemeka & Eze (2021) found that infrastructure development significantly boosts industrial productivity and economic growth in Africa. Uchendu & Obiora (2021) showed a positive relationship between financial market development and industrial investment in Nigeria. Okonkwo & Ibe (2022) indicated that globalization benefits economies with strong domestic industrial bases. Effiong & Udonwa (2024) found that industrialization significantly reduces unemployment in Nigeria, suggesting that infrastructure development should be prioritized to enhance industrial growth and economic stability.

tests, ensured model robustness. The study's findings offer insights for policymakers on sustainable economic development through industrialization strategies.

Results

Descriptive Statistics

The Table 1 presents the descriptive statistics for five (5) economic variables: GDP, INDO, FDI, INR and INFR. These statistics provide a summary of each variable's central tendency, dispersion and shape of distribution as well as additional measures that are useful for identifying the characteristic of the data.

Table 1: Descriptive statistics result

	GDP	INDO	FDI	INR	INFR
Mean	33603.62	21.37150	2.512250	9.353000	18.99850
Median	7515.800	15.17000	1.6100 00	6.140000	12.72000
Maximum	152324.1	54.76000	8.840000	65.68000	72.84000
Minimum	144.8300	5.100000	0.190000	0.990000	5.390000
Std. Dev.	45402.01	14.34481	2.565050	10.88160	16.86919
Skewness	1.269267	0.933442	1.168582	3.767973	1.823680
Kurtosis	3.354036	2.697672	3.155759	19.41017	5.159549
Jarque-Bera	10.94916	5.961096	9.144332	543.4737	29.94482
Probability	0.004192	0.050765	0.010336	0.000000	0.000000
Sum	1344145.	854.8600	100.4900	374.1200	759.9400
Sum Sq. Dev.	8.04E+10	8025.166	256.5997	4617.963	11098.21
Observations	40	40	40	40	40

Source: Researcher's Computation, 2024.

The descriptive data indicate that the mean values for Gross Domestic Product, Industrial Output, Foreign Direct Investment, Interest Rate, and Inflation Rate are 33603.62, 21.371.50, 2512250, 9.353000, and 18.99850, respectively. The series exhibits maximum values of 152324.1, 54.76000, 8.840000, 65.68000, and 72.840000, respectively. Conversely, the series reports minimum values of 144.8300, 5.100000, 0.190000, 0.990000, and 5.390000, respectively. The given data indicated that all variables exhibited a positive skewness. The analysis of kurtosis indicates that the industrial production exhibits platykurtic characteristics, whilst all other variables are stated to possess leptokurtic properties. The statistical significance of the probability values associated with the Jarque-Bera Statistics for all series, with the exception of industrial production, suggests that these series are not distributed according to a normal distribution.

Trends of Variables

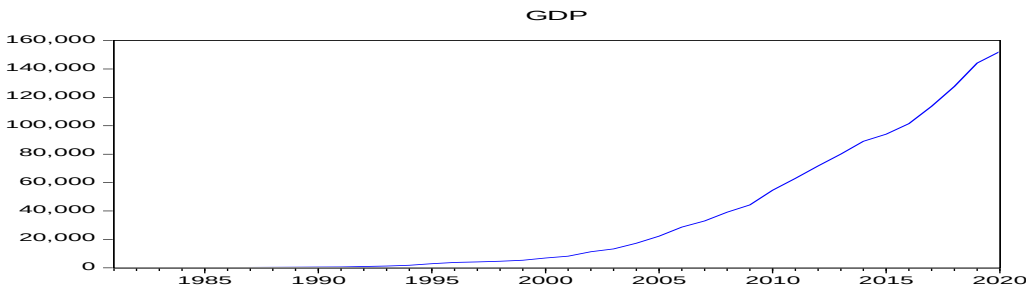

Figure 1: Trend of Gross Domestic product

Source: Researcher's Computation, 2024.

The trajectory of Gross Domestic Product (GDP) is illustrated in Figure 1. The graph demonstrates a consistent and gradual increase in GDP starting from 1993 and continuing consistently throughout the entire time. Notably, the highest point in GDP was seen in 2020, which represents the final year analyzed in this study.

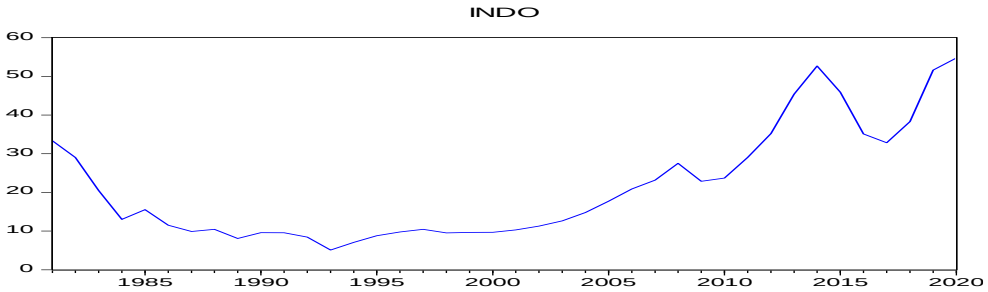

Figure 2: Trend of Industrial Output

Source: Researcher's Computation, 2024.

Figure 2 illustrates the temporal evolution of Industrial output spanning the years 1981 to 2020. The data reveals that Industrial output amounted to approximately 32 billion in 1981. Subsequently, it experienced a downward trajectory from the subsequent year until the year 2000, at which point it commenced an upward trend. However, there was a decline in 2009, followed by a resurgence in 2011. Notably, there was a significant decrease in 2011, followed by a subsequent increase in 2017, which persisted until the conclusion of the observed period.

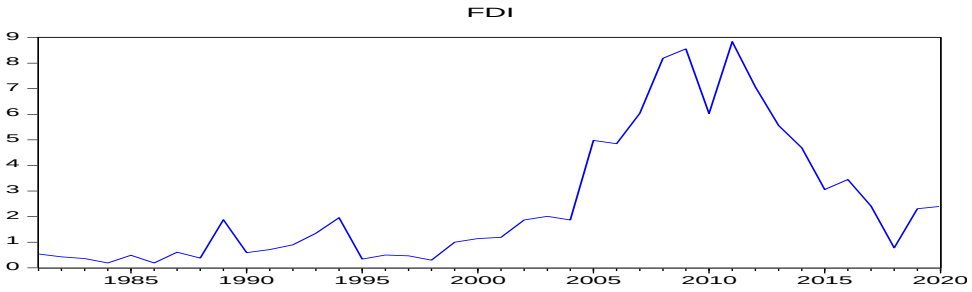

Figure 3: Trend of Foreign Direct Investment

Source: Researcher's Computation, 2024.

The trajectory of Foreign Direct Investment within the specified period is depicted in Figure 3 above. The initial observation reveals that Foreign Direct Investment (FDI) commenced at approximately 0.6 billion units at the onset of the specified period. Subsequently, a fluctuating pattern is observed, characterized by alternating increases and decreases, until reaching its pinnacle of approximately 8.9 billion units in 2012. Following this peak, a consistent decline is observed in 2013, persisting until 2019. However, from 2019

onwards, a renewed upward trajectory is observed, continuing until the conclusion of the specified period.

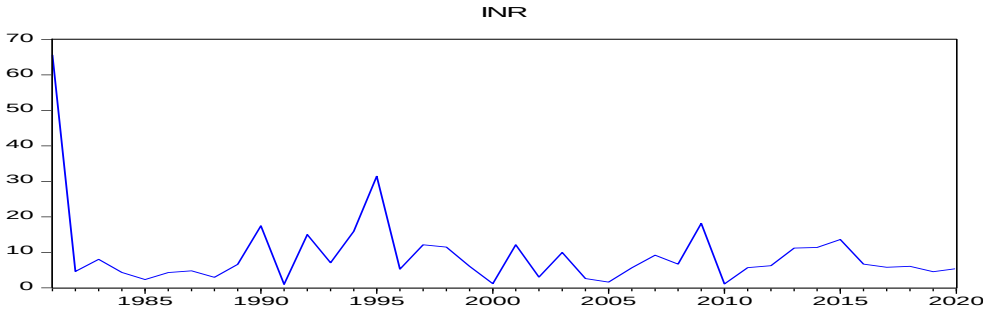

Figure 4: Trend of Interest Rate

Source: Researcher's Computation, 2024.

Figure 4 depicts the temporal trajectory of the Interest Rate (INR) across many years. The vertical axis represents the numerical value of the Interest Rate expressed as a percentage, while the horizontal axis represents the chronological progression of the years. The data indicates a significant decline in the trend between 1981 and 1982, followed by a period of fluctuation from 1983 to 1990, during which the highest decreases were observed. Subsequently, there was a sharp increase in 1995, which was succeeded by a period of fluctuation in both increases and decreases from 1996 to 2010, culminating in the lowest point. A rise occurred in 2011, and the trend continued to fluctuate until 2020.

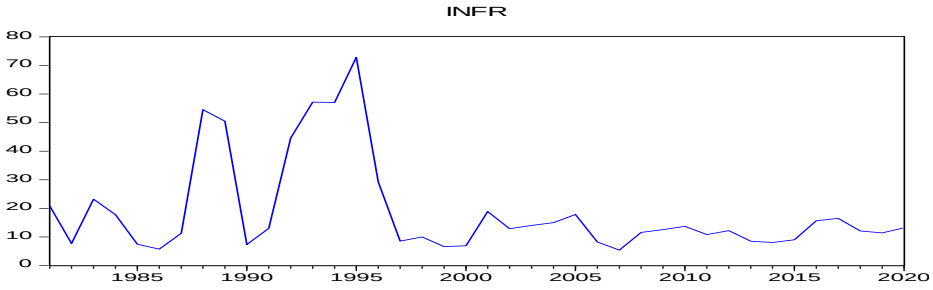

Figure 5: Trend of Inflation Rate

Source: Researcher's Computation, 2024.

Figure 5 illustrates the temporal progression of the Inflation rate (INFR) across many years. The vertical axis represents the Inflation rate expressed as a percentage, while the horizontal axis denotes the respective years. The data suggests that the inflation rate has exhibited fluctuations over the years. Notably, there was a significant surge in 1987 followed by a sharp decline in 1990. The most substantial increase was observed in 1995, which was subsequently followed by a decrease in 1997. From 2001 to 2017, there has been a consistent pattern of both upward and downward movements, until a decline was observed from 2018 to 2020.

Model Results

Table 2: Unit Root result

Variables	Level	1st Difference	Remark
LNGDP	-1.291259	-3.116414	I(1)
	(0.6240)	(0.0337)	
LNINDO	-0.413959	-4.842259	I(1)
	(0.8968)	(0.0003)	
LNFDI	-1.969787	-10.01723	I(1)
	(0.2984)	(0.0000)	
INR	-11.62534	-8.220441	I(0)
	(0.0000)	(0.0000)	
INFR	-2.968483	-5.752875	I(0)
	(0.0479)	(0.0000)	

Source: Researcher's Computation, 2024.

The levels of stationarity of the variables after the Unit root test are presented in Table 2 above. All variables under examination exhibit statistical significance at either the 1% or 5% level, thereby leading to the rejection of the null hypothesis that a unit root problem exists within the series. However, it is worth noting that the natural logarithm of Gross Domestic Product (GDP), the natural logarithm of industrial output, and the natural logarithm of foreign direct investment all exhibited stationarity after being differenced once. On the other hand, the interest rate and inflation rate remained stationary at their original levels.

Table 3: Lag Length Selection Criterion Output

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-393.8670	NA	2892.754	22.15928	22.37921	22.23604
1	-207.1041	311.2715	0.367423	13.17245	14.49205*	13.63303
2	-173.7153	46.37328	0.251032	12.70641	15.12567	13.55080
3	-126.1134	52.89105*	0.090218*	11.45074	14.96968	12.67895*
4	-96.06286	25.04212	0.113318	11.17016*	15.78876	12.78217

Source: Researcher's Computation, 2024.

The criteria for lag selection are determined by considering the lag length that is least frequently chosen according to several criteria, such as the Akaike Information Criterion (AIC), Schwartz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ). Based on the analysis conducted, it has been determined that the Lag 1 is the most suitable lag length, as it has been identified as the least value according to the Schwartz Information Criterion.

Table 4: ARDL bound Test Output

Test Statistic	**Value**	**K**
F-statistic	8.719790	4
Critical Value Bounds		
Significance	**I(0) Bound**	**I(1) Bound**
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Researcher's Computation, 2024.

Table 4 presents the results of the bound cointegration test conducted for the model. The findings from this test indicate that the null hypothesis (H_0) is swiftly rejected in favour of the alternative hypothesis (H_1). This rejection is supported by the F-Statistic value of 8.719790, which exceeds the critical values at the 1%, 2.5%, 5%, and 10% significance levels. Consequently, these results suggest the presence of a consistent long-run relationship among the variables examined in the study.

Error Correction Model (ECM)

Table 5: ECM Results

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-0.005118	0.027548	-0.185794	0.8538
D(LNGDP(-1))	1.024150	0.139413	7.346160	0.0000
D(LNINDO(-1))	-0.040534	0.054287	-0.746656	0.4609
D(LNFDI(-1))	0.024268	0.015311	1.584969	0.1231
D(INR(-1))	-0.000358	0.000882	-0.405662	0.6878
D(INFR(-1))	0.004271	0.000909	4.700864	0.0001
ECM(-1)	-1.405573	0.246404	-5.704341	0.0000
R-squared	0.708747	Mean dependent var		0.181328
Adjusted R-squared	0.652375	S.D. dependent var		0.106256

S.E. of regression	0.062648	Akaike info criterion	-2.537737
Sum squared resid	0.121669	Schwarz criterion	-2.236076
Log likelihood	55.21700	Hannan-Quinn criter.	-2.430408
F-statistic	12.57277	Durbin-Watson stat	1.783569
Prob(F-statistic)	0.000000		

Source: Researcher's Computation, 2024.

The ECM results presented in Table 5 indicate the relationships between various economic variables and GDP growth in Nigeria. The coefficient for D(LNGDP(-1)) is 1.024150 with a p-value of 0.0000, showing a positive and significant impact on economic growth, suggesting a 1.02% increase in GDP growth for each percent increase in lagged GDP. D(LNINDO(-1)) has a coefficient of -0.040534 (p-value 0.4609), indicating a negative but not statistically significant effect. D(LNFDI(-1)) shows a positive coefficient of 0.024268 (p-value 0.1231) but is also not significant. D(INR(-1)) has a coefficient of -0.000358 (p-value 0.6878), showing a negligible, non-significant negative impact. D(INFR(-1)) has a positive and significant coefficient of 0.004271 (p-value 0.0001), indicating a 2% increase in GDP growth per percentage increase in inflation.

The ECM(-1) coefficient is -1.405573 with a p-value of 0.0000, showing significant correction of disequilibrium between short-term and long-term dynamics at 141% annually. The R-squared value of 0.708747 suggests that 71% of the variance in GDP is explained by the model's variables. The F-Statistic of 12.57277 (p-value 0.000000) confirms the model's adequacy, indicating that all independent variables collectively impact GDP significantly. The Durbin-Watson statistic of 1.7835569 suggests positive autocorrelation in the model. Overall, the results highlight the significant roles of lagged GDP and inflation in driving economic growth in Nigeria, while the impacts of industrial output, FDI, and interest rates remain statistically insignificant in the short run.

The study explores the influence of industrial production on Nigeria's economic growth from 1981 to 2020 using data from the Central Bank of Nigeria (CBN) and the World Bank. Findings reveal bi-directional causality between industrial output and economic growth, indicated by F-statistics of 35.3164 and 18.9976. Additionally, a unidirectional relationship exists between Foreign Direct Investment (FDI) and economic growth (F-statistics of 5.21899), and between inflation and economic growth, while no causal link is found between interest rates and economic growth.

Data analysis shows positive skewness and non-normal distribution for GDP and industrial output (INDO), with GDP consistently rising post-1993 and peaking in 2020. Industrial output fluctuated, notably declining in 2009 and recovering by 2017. FDI saw significant fluctuations, peaking in 2012, then declining until 2019 before rising again. Both interest and inflation rates displayed variability, reflecting economic volatility.

Stationarity tests indicated that variables like LNGDP, LNINDO, and LNFDI are integrated of order one (I(1)), while INR and INFR are integrated of order zero (I(0)). The ARDL Bound Test confirmed a long-run relationship among the variables, with an F-statistic of 8.719790. The Error Correction Model (ECM) revealed that lagged GDP and inflation significantly impact economic growth, while industrial output and FDI have less clear short-term effects. The ECM's negative coefficient (-1.405573) suggests rapid adjustment back to equilibrium, correcting about 141% of disequilibrium annually.

The findings of the study corroborate prior studies by Ajidele & Ekpo (2014) and negates the assertion of Iya,

et. al. (2016) and Obioma, et. al. (2015), which posited negative insignificant and positive significant and insignificant impacts of industrial activities on economic growth. FDI's positive insignificant impact contradicts the work of Obioma, et. al. (2015), emphasizing the role of globalization and economic policies. Interest rate exhibits a negative insignificant impact on economic growth and Inflation rate showed a positive influence on economic growth. Financial development's importance in facilitating industrial investment is indirectly supported by the correlation between economic indicators like FDI, inflation rates, and GDP growth, as noted by King and Levine (2013) and Caprio & Demirguckunt (2017).

Granger causality tests confirmed bidirectional causality between industrial output and GDP, suggesting mutual predictability, while FDI showed a unidirectional causality towards GDP. The analysis highlighted substantial GDP and industrial output fluctuations, with GDP consistently rising post-1993 and industrial output showing declines and recoveries.

The ARDL Bound Test confirmed a long-run relationship among the variables, indicating significant influences of industrial production, FDI, interest rates, and inflation on Nigeria's GDP. The ECM suggested rapid equilibrium adjustment with lagged GDP and inflation significantly impacting economic growth. Bidirectional causality between industrial output and GDP supports the substantial impact of industrial activities on economic growth, consistent with prior empirical studies.

Table 6: Diagnostic test outputs

Test	F-statistics/ Jarque Bera	Probability	Remark
Heteroskedasticity	1.355684	0.2535	There is no heteroskedasticity
Serial correlation LM	1.365374	0.2594	Series are not serially correlated
Normality Test	2.717121	0.257030	Residuals are normally distributed

Source: Researcher's Computation, 2024.

Table 7: Granger Causality Results

Null Hypothesis	F-Statistic	Prob.	Conclusion
LNINDO does not Granger Cause LNGDP	35.3164	8.E-07	
LNGDP does not Granger Cause LNINDO	18.9976	0.0001	Bi-directional Causality
LNFDI does not Granger Cause LNGDP	1.00014	0.3240	
LNGDP does not Granger Cause LNFDI	5.21899	0.0283	Uni-directional Causality
INR does not Granger Cause LNGDP	0.25223	0.6186	
LNGDP does not Granger Cause INR	0.00047	0.9829	No Causality
INFR does not Granger Cause LNGDP	10.2167	0.0029	
LNGDP does not Granger Cause INFR	1.71319	0.1989	Uni-directional Causality

Source: Researcher's Computation, 2024.

Recommendations

The study based on the findings recommends encouraging technological advancements and improving financial markets that foster innovation and capital access for enhancement of the industrial sector and encouraging foreign investment. Policies should prioritize stabilizing and reducing interest rates to boost industrial investment. Improving the business environment will attract more FDI. Managing inflation carefully is crucial to stabilize it without hindering growth. Continuous research and monitoring of economic indicators studied should continue to refine understanding and guide policy adjustments.

References

Adebosin, S., & Toriola, O., (2019). Industrialization and Economic Growth in Nigeria. *Journal of Economic Development Studies*.

Ajidele, P., & Ekpo, S., (2014). A Review of the Nigerian Industrial Sector and the Impact of Import Dependency on its Growth. *Journal of Industrial Economics, 22(4), 330-347.*

Brundtland, G., (2017). Industrialization and Economic Progress. *Journal of Modern Economies, 11(2), 58-76.*

Caprio, G., & Demirguckunt, A., (2017). The Importance of Long-Term Finance: Theory and Evidence. *Finance and Development Journal, 34(1), 25-47.*

Cherniwchan, J. (2012). Economic Growth, Industrialization, and the Environment. Resource and Energy Economics, 34, 442-467.

Chukwuemeka, E., & Eze, O., (2021). Infrastructure Development and Industrial Growth in Africa. African Development Review, 33(1), 88-100.

David, L., (2015). Impact of Industrialization on Economic Growth. Global Economic Review, 18(3), 215-229.

Effiom, L., & Udah, B., (2014). Industrialization and Regional Development: Job Creation and Poverty Alleviation in Nigeria. *Development Studies Journal, 20(4), 15-29.*

Effiong, U., & Udonwa, U. (2024). Industrialization and Employment Generation in Nigeria: An Empirical Analysis. *African Journal of Commercial Studies.*

Franck, R., & Galor, O. (2015). Is Industrialization Conducive to Long-Run Prosperity? *Economic Growth eJournal*.

Iya, I., Anono, A. Z., & Abubakar, A. (2016). Industrialization and economic growth relationship in Nigeria. *Journal of Advances in Social Science and Humanities, 2*.

King, R. G., & Levine, R., (2013). Finance and Growth: Schumpeter Might Be Right. *Quarterly*

Lewis, W. A. (1954). Economic Development with Unlimited Supplies of Labour. Manchester School.

Lucas, R. E. (1988). On the Mechanics of Economic Development *Journal of Monetary Economics*.

Obioma, B. K., AnyanwuUchenna, N., & Kalu, A. O. U. (2015). The Effect of Industrial Development on Economic Growth (An Empirical Evidence in Nigeria 1973-2013). *European Journal of Business and Management, 7, 160-170*.

Okafor, L., Adekunle, B., & Uzochukwu, G. (2019). Industrialization and Environmental Sustainability in West Africa: A Panel Data Analysis. Environmental *Economics and Policy Studies, 21(2), 201-217.*

Okonkwo, U., & Ibe, R. (2022). Globalization and Economic Diversification: Dynamic Effects in Emerging Economies. *Emerging Markets Review, 23(1), 45-63.*

Onwumere, J., (2010). The Role of Industrialization in Economic Development. *Economic Insights, 12(1), 42-56.*

Opoku, E., & Yan, I. K. M. (2018). Industrialization as driver of sustainable economic growth in Africa. *The Journal of International Trade & Economic Development*, 28, 30-56.

Ricardo, D. (1817). On the Principles of Political Economy and Taxation.

Romer, P. M. (1990). Endogenous Technological Change. *Journal of Political Economy*.

Rostow, W. W., (1960). The Stages of Economic Growth: A Non-Communist Manifesto. *Cambridge: Cambridge University Press.*

Schumpeter, J. (1942). Capitalism, Socialism, and Democracy.

Smith, A. (1776). The Wealth of Nations.

Stewart, F. (2012). Technology and Underdevelopment. London: Macmillan.

Tsuwa, T. J., (2011). The Dynamics of Industrialization in Developing Countries. *International Journal of Industrial Organization, 29(3), 251-265.*

Uchendu, O., & Obiora, I. (2021). Financial Markets and Industrial Investment in Nigeria: A Co-integration Approach. *Journal of Finance and Industrial Investments, 12(3), 134-150.*

Udi, J., Bekun, F., & Adedoyin, F. (2020). Modeling the nexus between coal consumption, FDI inflow, and economic expansion: does industrialization matter in South Africa? *Environmental Science and Pollution Research International journal, 27, 10553-10564.*

Uzochukwu, B. (2018). Challenges of Industrial Development in Nigeria. *Journal of African Economic Development, 16(1), 103-117.*