



African Journal of Commercial Studies

Publisher's Home Page: <https://ijcsacademia.com/>



Research Paper

Open Access

Industrialization and Employment Generation in Nigeria: An Empirical Analysis

Ubong Edem Effiong^{1*}, Ubong Ekerete Udonwa¹

¹Department of Economics, University of Uyo, Akwa Ibom State, Nigeria. E-mail: ubongeffiong3@gmail.com

Article Info

Volume 4, Issue 1, January 2024

Accepted : 20 December 2023

Published : 31 December 2023

doi: [10.59413/ajocs/v4.i1.2](https://doi.org/10.59413/ajocs/v4.i1.2)

Ark: ark:/69431/AJoCS.v4i1.2

Abstract

This study examined the impact of industrialization on employment creation, taking evidence from the Nigerian economy and using annual data covering the period of 1990 to 2022. The specific objectives were to determine the causal relationship between industrialization and employment creation in Nigeria and to examine the impact of industrialization on employment creation in Nigeria. To draw empirical evidence, the econometric methods of autoregressive distributed lag (ARDL) with Error Correction Mechanism (ECM) and the Granger causality test were employed as the analytical techniques. The results of the ARDL and ECM reveal that a short-run and long-run relationship exists between industrial sector output and employment creation (proxied by the unemployment rate) in Nigeria. With the establishment of a long-run relationship and the aid of the ARDL bounds test for cointegration, the long-run and short-run estimates were estimated. The findings of the study reveal that industrial sector performance has a negative and significant impact on the unemployment rate in Nigeria. In other words, it has a positive and significant impact on employment creation in Nigeria. Therefore, the study, among other requisite recommendations, suggests that the Nigerian authority prioritize the growth and improvement of the industrial sector through the provision of basic infrastructure such as transport networks, energy systems, and communication technologies, among others.

Keywords: Industrialization, Unemployment, employment generation, economic growth

© 2024 Ubong Edem Effiong This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

1. Introduction

Most developing countries view the pursuit of industrialization as a central objective within their economic policies. Certain economists and analysts, such as [Atan and Effiong \(2020\)](#) and [Ogbimi \(2007\)](#), argue that industrialization plays a significant role in the creation of employment opportunities within a nation. Prior to the era

of colonial rule in Nigeria, Nigerians were involved in a multitude of economic activities and were regarded as one of the most active and diligent groups of individuals in Africa. These economic activities predominantly revolved around primary production, particularly agriculture, encompassing farming, hunting, and quarrying. The arrival of European colonizers in Nigeria brought about a

transformation in the lifestyle of Nigerians, resulting in a shift from an agrarian-based economy to one that was reliant on the market for imported manufactured goods. Simultaneously, the colonial powers utilized the Nigerian economy as a source of both mineral and agricultural resources to support their own industries. Sadly, these resources were exported at a lower cost, while the prices of the imported products were set exorbitantly high, thereby exploiting the nation. Moreover, the colonial rulers made no efforts to promote industrialization in Nigeria, and Nigerians lacked the motivation to engage in industrial activities. Consequently, Nigeria found itself technologically and industrially disadvantaged. However, with Nigeria's attainment of political independence in 1960, the first national development plan was introduced in 1962, with the primary objective being industrialization. The objective of industrialization in Nigeria aimed to achieve import substitution and export promotion (Saver, 2003). The development of industries and the generation of employment are crucial for any developing country. In an economy where industries are prevalent, a majority of the unemployed population can participate in productive endeavors. Encouraging industrial development can greatly benefit the developing economy, leading to increased employment opportunities and enhanced economic growth.

Industrialization was purely understood in economic terms, particularly the physical presence of individual plants that were involved in manufacturing capital goods, either for further use or for other purposes. By the beginning of the 20th century, therefore, a country's industrialization was measured by the percentage of plants and/or industries involved in manufacturing as well as the volume of labor within such industries (Todaro, 1989). According to the Africa Economic Outlook (AEO, 2017), industrialization is seen as a catalyst for job creation, higher productivity, and innovation, and innovative industrialization strategies should target high-potential entrepreneurial activities because they have a role in bringing innovation to economies as a result of fresh ideas and the exchange of information that is capable of increasing competitiveness. Ojo (1987) put forward the view that industrialization can be understood as the progression through which the industrial sector of a country or region advances its contribution to the gross domestic product (GDP), employment, poverty reduction endeavors, and investment, among other factors. In accordance with Holis and Bachenev (1999), industrialization represents the primary aspiration of most nations striving to enhance their income level. This augmentation in income level will be realized through the activation of employment generation. Drawing from the research conducted by Shaw and Emer (2000), industrialization is the process by which manufacturing assumes an increasingly significant role in the economic structure of society.

Throughout the years, the Nigerian government has devised and implemented various industrial policies and

strategies with the objective of fostering the industrialization of the economy. Some of these policies encompass approaches such as import substitution, export promotion, and industrialization led by foreign private investment, as well as policy reform measures like indigenization and structural adjustment programs. Substantial public investment has been allocated to the industrial sector, with the establishment of research and training institutes aimed at providing the essential foundation for the growth of the country's industrial sector. These institutes serve to furnish the fundamental engineering infrastructure necessary for the production of raw materials, spare parts, equipment components, and machinery required by the diverse industrial establishments in Nigeria. Notable examples include the Industrial Core Projects (ICPS), the Federal Institute for Industrial Research (FIIR), the Project Development Agency (PRODA), and the Raw Materials Research Development Centre (RMRDC), among others. Given the commendable efforts dedicated to industrialization, one would anticipate that the industrial sector would have overcome initial challenges and made significant contributions to employment generation and overall economic development and structural transformation in Nigeria. However, careful examination reveals a different narrative.

The concept of industrialization in Nigeria entails the conversion of the country's peasant or idle workforce into full-time or part-time industrial laborers, while simultaneously transforming the structure of the Nigerian economy. This transformation is anticipated to enhance the standard of living of the population and stimulate economic growth. The need for industrialization has emerged as one of the challenges confronting Nigeria, as evidenced by the deteriorating state of the country's industrial sector. Data from the National Bureau of Statistics (NBS) reveals a substantial decline in the industrial value's contribution to GDP, with a reported GDP contraction of -8% in the third quarter of 2022. The industrial sector in Nigeria accounts for a meager proportion of economic activity, constituting only 6 percent, while the manufacturing sector contributed a mere 4 percent to GDP in 2011. These figures persist despite policy endeavors spanning the past five decades and, more recently, that have sought to facilitate the process of industrialization. At present, the Nigerian government has made available sources of finance specifically targeted at the industrial sector. However, despite these efforts, numerous industries have collapsed, while a significant number are striving to remain viable.

The analysis conducted by Effiong (2022) reveals significant fluctuations in the performance of the industrial sector during the 2020s, compared to the 1980s and 1990s. For instance, the industrial value added as a percentage of GDP was 39.245% and 37.71% in 1981 and 1992, respectively, while it was 27.383% and 28.221% in 2019 and 2020, respectively. This decline in the industrial sector has undoubtedly impacted employment generation in

Nigeria, particularly during the recession induced by the pandemic in 2019. The nation's workforce experienced a considerable reduction, with an increase in the unemployment rate reaching 33 percent between Q2 and Q4 of 2020. However, it is widely acknowledged that industrialization can stimulate economic development, create employment opportunities, enhance productivity, and boost foreign exchange reserves (Holis & Bachenev, 1999). Since the advent of the industrial revolution, manufacturing has played a pivotal role in driving structural transformation, consistently generating higher levels of output and employment and fueling unprecedented income growth. The resulting rise in income has, in turn, led to a greater demand for manufactured goods and a relative decline in expenditure on agricultural products (UNIDO, 2013).

Insufficient capital is one of the reasons why the Nigerian economy is characterized as underdeveloped or developing. Substantial capital is required for industrial development, as it is a capital-intensive endeavor that demands abundant labor and capital. When adequate funds or capital formation are not made available in a timely manner for industrialization, or when they are available but not effectively utilized, it tends to create economic problems.

Currently, in Nigeria, the government has established various sources of financing specifically targeted at the industrial sector, such as the Nigerian Industrial Development Bank (NIDB), the Bank of Industry (BOI), and the Nigerian Bank for Commerce and Industry (NBCI). However, despite these efforts, many industries have collapsed, while others are striving to survive. The provision of finance and the creation of an enabling environment for industries remain problematic in Nigeria, necessitating a comprehensive solution. The overarching objective of this study is to examine the impact of industrialization on employment generation in Nigeria from 1990 to 2021. The specific objectives of this study are as follows: to analyze the nature of the causal relationship between industrialization and employment generation in Nigeria, to investigate the influence of industrialization on employment generation in Nigeria, and to determine the influence of industrialization on economic growth in Nigeria.

2. Literature Review

2.1. Trends and Status of Employment Generation in Nigeria

Employment generation refers to the process of creating new job opportunities within a given economy or society. It involves the creation of work opportunities for individuals, leading to increased employment rates and reduced unemployment. Below is a tabular representation of the trends and status of employment in Nigeria between 2012 and 2022, showing how Nigeria has fared in its employment status.

Table 2.1. Total jobs created in Nigeria (2012-2022)

Year/Se ctors	Formal Sector Jobs	Informal Sector Jobs	Public Sector Jobs	Total New Jobs
2012	152,018	208,920	24,975	385,913
2013	101,597	143,278	20,827	265,702
2014	138,026	227,072	4,387	369,485
2015	27,246	476,563	-4,288	499,521
2016	49,587	144,651	-7,012	187,226
2017	79,114	300,121	9,722	388,957
2018	73,493	287,101	2,809	363,403
2019	57,360	302,109	308	359,776
2020	64,889	258,496	1,457	324,842
2021	68,714	286,956	3,574	359,244
2022	66,114	283,666	2,037	351,817

Source: National Bureau of Statistics, 2016, and Interpolated data, 2017-2022.

The employment situation in Nigeria will be the primary focus from 2012 to 2022, with an emphasis on the formal jobs sector, informal jobs sector, and public jobs sector as illustrated in Table 2.1. The formal jobs category encompasses employment opportunities provided by establishments that hire ten or more individuals, as well as formal professional services that employ a workforce exceeding ten individuals. On the other hand, the informal jobs sector includes jobs created by individuals or businesses that employ fewer than ten people or operate with minimal or no organizational structures. Examples of such businesses include those in the agriculture, wholesale and retail trade, and personal services sectors, such as barbers, hairdressers, mechanics, plumbers, and the like. The public sectors, meanwhile, are composed of government ministries, departments, agencies, government parastatals, academic and research institutions at the federal, state, and local government levels (NBS, 2023). Available data reveals that the Nigerian economy generated a total of 385,913 jobs in the fourth quarter of 2012. Figure 2.1 provides a visual representation of the employment generation trends in Nigeria over a certain time period.

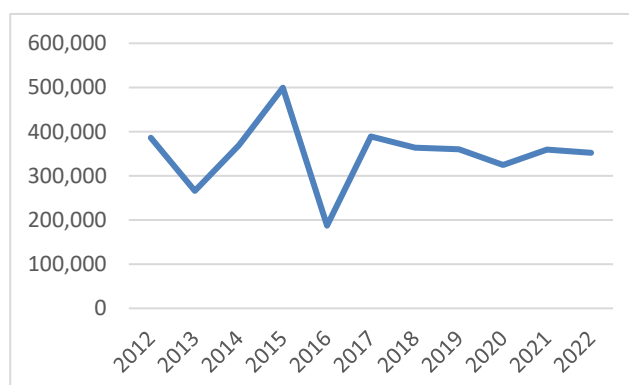


Fig. 2. 1: Trend of Total Jobs Created in Nigeria (2012-2022).

A breakdown of employment opportunities established during the fourth quarter of 2012 suggests that there were 152,018 positions created in the formal sector, 208,920 positions in the informal sector, and 24,975 positions in the public sector (NBS, 2013). The fourth quarter of 2013 witnessed the generation of 265,702 positions, indicating a decrease in job creation compared to the previous year. The formal sector contributed 101,597 positions, while the formal and public sectors accounted for 143,278 and 20,827 positions respectively in the overall employment opportunities generated by the end of 2013 (NBS, 2014). By the end of 2014, the Nigerian economy had witnessed the creation of 369,485 jobs across all sectors, demonstrating an increase in job generation of 265,702 positions compared to 2013. In 2014, the formal sector was responsible for 37.4% of the total jobs created, amounting to 138,026 positions. Conversely, the informal and public sectors contributed 227,072 positions (61.5%) and 4,387 positions (1.2%) respectively (NBS, 2015). The year 2015 saw the creation of 499,521 jobs across all sectors of the Nigerian economy, indicating a further increase of 369,485 positions compared to the previous year. Within this period, the formal sector accounted for 5.5% of the total jobs created, amounting to 27,246 positions. The informal sector, on the other hand, contributed 95.4% of the total jobs, totaling 476,563 positions, while the public sector experienced a decline of -8.9% in job creation (NBS, 2015).

In the fourth quarter of 2016, the total number of jobs generated was 187,226, which represents a significant decrease compared to the 499,521 jobs created in 2015. The increase in job numbers in 2016 was primarily driven by the informal sector, accounting for 77.2% of the total jobs created, equivalent to 144,651 positions. This increase was also influenced by the formal and public sectors, contributing 26.5% of the total jobs created (49,587 positions) and experiencing a decline of 3.8% (7,012 positions) respectively. The decline in job creation in 2016 can be partially attributed to the recession that impacted the Nigerian economy (NBS, 2016). The data presented in the table illustrates that from 2017 to 2022, the informal sector was responsible for the majority of job generation in Nigeria. The increase in employment within this sector was primarily observed in rural agricultural activities, as the farming season commenced and rural and subsistence farmers became fully engaged on their farms. Additionally, the rise in informal jobs can be attributed to the inclusion of individuals who were previously not part of the labor force but are now actively seeking employment in the informal sector due to the lack of formal white-collar jobs. It also shows that there is a fluctuation in formal and public employment generation which is visible across most economic activities. At the end of the fourth quarter of year 2022, less than 400,000 jobs were created across all sectors of the Nigerian economy (NBS, 2022).

2.2. Theoretical Framework

Keynes Theory of Employment

The theory, commonly referred to as the theory of employment of effective demand, was proposed by John Maynard Keynes in 1936. Keynes argued that the level of employment in the short term is contingent upon the collective demand for goods and services. He disputed the classical view that full employment is the norm, instead positing that it is an exceptional circumstance. Keynes regarded full employment as a transitory phenomenon, a fortuitous occurrence. He deemed his theory to be universally applicable, hence the title of his seminal work: *The General Theory of Employment, Interest and Money* (1936). Consequently, this theory is considered "general". In this publication, Keynes not only criticized classical macroeconomics but also introduced a "new" theory of income and employment. Keynes' theory of employment is rooted in the concept of deficient demand, which means that he viewed employment from the perspective of demand. Therefore, this theory is commonly known as a demand-oriented approach. According to Keynes (1936), the level of employment in a country depends on the effective demand of the population for goods and services. It is worth noting that Keynes' theory is applicable in the short term, assuming a constant population, labor force, and technology. Keynes once famously stated that since "in the long run we are all dead," there is no need to present a long-term theory. In this context, one could argue that the level of employment is contingent upon the level of national income/output (Muley, 2015).

The higher (lower) the level of national output, the higher (lower) the level of employment. Thus, the Keynesian theory of employment determination also serves as a theory of income determination. Hence, the principle of "effective demand". An increase in effective demand leads to a rise in production within the economy. This increased production, which is believed to be a result of government policy intervention, including industrialization, generates more jobs, thereby boosting the nation's economy. Furthermore, an increase in effective demand is also accompanied by inflation, which can be beneficial for the economy if kept under control. Therefore, the Keynesian theory of employment takes a generally optimistic approach to the economy of a nation. It assists in addressing economic crises such as the Great Depression and recessions.

2.3. Empirical Review

Most studies reviewed in the literature examine the relationship between industrialization and macroeconomic variables. Godfrey (2011) conducted a study on the influence of industrial output on the growth of the Nigerian industrial sector during the period of 1980-2009. The main analytical tool used in this study was the Autoregressive Distributed Lag model, and secondary data was employed. The findings of the study indicated that there was no statistically significant impact of industrial output on

economic growth. Additionally, it was observed that savings had a positive and significant relationship with economic growth (GDP), while inflation had a negative relationship. Furthermore, the study found that net foreign capital flow had a positive and significant impact on economic growth. Based on these findings, the author recommended an increase in savings to make money more available for the economy through low interest rates and income adjustments from the monetary policy.

Tomuno and Edoumiekumo (2011) conducted a study on the impact of globalization on the Nigerian industrial sector. The performance of the Nigerian industrial sector was measured using the Index of industrial production, and globalization was represented by proxy variables such as external debt, foreign direct investment, nominal exchange rate, and degree of openness. Domestic investment was measured using gross capital formation. The study utilized annual data from the Central Bank of Nigeria (CBN) covering the period from 1970 to 2008. The results of the Johansen's co-integration test revealed the presence of four co-integrating equations, indicating a long-run relationship between the variables. The ordinary least square technique was employed for model estimation. Surprisingly, the results showed that gross fixed capital formation and degree of openness did not align with the expected outcomes. The study concluded that the Nigerian industrial sector has a weak foundation and struggles to compete with foreign counterparts.

Akinbola, Zekeri, and Idowu (2017) conducted an investigation into the link between power supply and industrial development in Nigeria. Specifically, they examined the influence of government policies on power supply and industrial development. The study employed the Johansen co-integration technique to determine the long-run relationship among various macroeconomic variables, including the industrial component of Real Gross Domestic Product (GDP). The independent variables considered in the analysis were electricity consumption, electricity production (Kwh), growth rate of the labor force, real gross fixed capital formation, and telephone lines per hundred population. Annual time series data from 1981 to 2010 were collected from the CBN statistical bulletin, World Bank, and United Nations Statistics. The order of integration of the variables was tested using the Augmented Dickey Fuller (ADF) and Philip-Perron (PP) tests. Additionally, a Vector Error Correction Model (VECM) was employed to correct any possible disequilibrium in the short-run relationships. The study concluded that the existing government policies on electricity supply had a negative impact on industrial output in the long run, thereby affecting the business viability.

Peter (2015) conducted an investigation into the impact of foreign direct investment and the performance of the industrial sector on the Nigerian economy. The study utilized time series annual data spanning from 1981 to 2015. The research explored the dynamics among the

variables within the Vector Error Correction Model (VECM). The Augmented Dickey Fuller (ADF) and Philip Perron's (PP) tests indicated that all variables exhibited a unit root and were integrated of order one I(1). The Johansen Cointegration test yielded results indicating the existence of a long-run relationship between FDI, Industrial Sector Output, and GDP. Furthermore, the estimation using VECM revealed that FDI and industrial sector output had a modest yet statistically significant positive impact on GDP. The study concluded that Nigeria has yet to fully capitalize on the benefits of FDI, as its contribution to GDP remains relatively low, while the industrial sector's contribution to economic growth in Nigeria has been insufficiently dynamic.

Benneth, Anyanwu, and Kalu (2015) examined the impact of industrial development on Nigeria's economic growth over the period from 1973 to 2013. The study employed the Ordinary Least Square (OLS) method to assess the influence of the independent variable on the dependent variable. GDP served as the dependent variable, while foreign direct investment, industrial output, total savings, and inflation were considered as independent variables. The model indicated that the influence of industrial output on economic growth is not statistically significant, although the expected positive relationship between industrial output and GDP was observed but lacked substantial strength. Based on the findings, it is recommended that the government and its agencies prioritize political stability and implement strategic policies that foster a level playing field for foreign investors, particularly in the manufacturing industries, to encourage the industrialization of the Nigerian economy. These measures would facilitate the strengthening of economic growth.

Iniekpo (2016) analyzed the impact of industrialization on Nigeria's economic growth during the period from 1970 to 2014. The study employed OLS regression analysis to examine the relationship between the industrial sector and economic growth. The Johansen cointegration test was utilized to explore the long-run effect of the industrial sector's contribution to Nigeria's economic growth. The dependent variable was Real Gross Domestic Product, while the independent variables included inflation rates, industrial output, foreign direct investment, and total savings. The results revealed a positive and significant effect of industrialization on Nigeria's economic growth. Additionally, the findings indicated a positive and significant relationship with inflation rates, a positive and significant relationship with industrial output, a negative and insignificant relationship with foreign direct investment, and a negative and significant relationship with total savings.

Olusoji and Oderinde (2017) examined the effects of industrialization and economic growth on employment generation in Nigeria and evaluated their employment elasticity over the period 1990–2016. The analysis adopted

ordinary least estimation after the absence of simultaneity was confirmed with the use of annual time series data. The result proved that economic growth has a positive impact on employment generation, while industrialization is not significant in promoting employment in the Nigerian economy. They opined on the vigorous pursuit of policies that will encourage industrial strategy, which will promote employment generation.

Marcus, Chinedu, and Amachukwu (2017) conducted a study that examined the impact of industrialization on economic growth in Nigeria. The research focused on the period from 1985 to 2015 and investigated both the short-term and long-term effects of industrialization on economic growth. Various factors were taken into consideration, including Real GDP, output of the agricultural sector, output of the industrial sector, output of the manufacturing sector, gross fixed capital formation, and the labor force. The study employed the Engle-Granger two-step procedure for co-integration. The results revealed that the agricultural sector, industrial sector, manufacturing sector, and gross fixed capital are significant determinants of economic growth in Nigeria, both in the short run and the long run. However, the labor force was found to have an insignificant negative impact on real GDP in the short run. Furthermore, the error correction model indicated that any deviation from the long run equilibrium path is corrected up to 62 percent annually.

Ndiaya and Kanguan (2018) contributed to the investigation of the impact of industrialization on economic growth by analyzing the manufacturing firms in Senegal. The study utilized secondary data from the World Bank Indicator and the National Agency of Statistic and Demography in Senegal (ANSD) from the period of 1960 to 2017. The Ordinary Least Square (OLS) technique was employed to estimate the relationship between industrial output, inflation rate, Foreign Direct Investment, Foreign Exchange Rate, and economic growth. In addition, the ADF unit root test was conducted using the Breusch-Godfrey serial correlation LM test and the Breusch-Pagan-Godfrey heteroskedasticity test. The econometric analysis demonstrated that an increase in industrial output leads to an increase in economic growth in Senegal. Therefore, there is a significant relationship between industrial development and economic growth in Senegal. The findings also indicated that industrialization plays a crucial role in stimulating economic growth. Based on these results, the study made recommendations, including the need for the Senegalese government to create a conducive investment environment by addressing structural rigidities in the economy in order to encourage industrial activities.

Abubakar and Inedu (2018) conducted a study that examined the relationship between industrialization and the quest for economic diversification in Nigeria. Specifically, the study analyzed the structure and trend of industrial output in Nigeria and evaluated the effect of industrial output on economic diversification. The

theoretical framework of the study was based on the Great Push Theory and Kaldor's First Law. The researchers utilized an econometric design and collected secondary data from various sources, including the Central Bank of Nigeria, National Bureau of Statistics publications, and World Bank Development Indicators, covering the period from 1970 to 2017. Descriptive and analytical tools were employed, and the Vector Error Correction Model was used for estimation. The findings of the study, based on the impulse response, revealed that solid minerals, manufacturing, and crude petroleum and natural gas have a negative relationship with real gross domestic product.

In their study conducted in 2019, Peter, Felix, and Anagha examined the relationship between industrialization, infrastructure, and various factors such as electricity supply and education in Nigeria. They utilized time series data to empirically determine if a predictable relationship exists between these factors and their significance in stimulating industrialization in Nigeria. The data analysis from 1970 to 2008, which employed unit root test and vector auto-regression model (VAR), yielded interesting results. The findings from impulse response and variance decomposition confirmed that the main sources of fluctuations in industrialization in Nigeria are primarily due to internal shocks, with a lesser influence from electricity supply and education. In essence, electricity supply and education do not provide any predictable information about industrial activity nor do they demonstrate a stable and predictable connection with industrialization in Nigeria. This lack of correlation may be attributed to the low budget allocation to these infrastructure sectors, which has diminished their significance in predicting the state of industrialization in Nigeria.

In their work published in 2020, Afolabi and Ogunjimi emphasized the role of industrialization as a roadmap to inclusive growth in Nigeria, considering the country's monocultural economy and the volatility of the crude oil market. Their study, titled "Industrialization: A Roadmap to Inclusive Growth in Nigeria," focused on the impact of the agricultural, industrial, and service sectors on inclusive growth (measured by GDP per capita) and unemployment rate using data from 1991 to 2018. The empirical findings revealed that periods of low industrial output corresponded with high unemployment rates and low income per capita in Nigeria. Moreover, the results indicated that a 1% increase in industrial output is associated with a likely increase of 0.38% in GDP per capita and a decrease of 0.03% in the unemployment rate. This implies that enhancing the performance of the industrial sector not only increases the income of Nigerian residents but also reduces unemployment.

Atan and Effiong (2020) conducted an empirical investigation into the role of the industrial sector in addressing youth unemployment in Nigeria. They analyzed time series data spanning from 1991 to 2019 and employed the Augmented Dickey Fuller and Philip-Peron test

techniques to conduct unit root tests. The data were further analyzed using the ARDL approach and Granger causality test. The results of the unit root test indicated that the variables were integrated with mixed orders of levels and first differences, necessitating the use of the ARDL bounds test of co-integration. The bounds test revealed a long-run/levels relationship between youth unemployment rate (as a proxy for youth unemployment) and explanatory variables such as industrial output, bank credit to the industrial sector, interest rate, inflation rate, broad money, government expenditure on economic services, population growth, and trade openness. Additionally, the results demonstrated that 62.15% of the short-run disequilibrium is corrected annually, as indicated by the error correction term of -0.6215. It was revealed further from the result that industrial output exerts a negative effect on youth unemployment both in the short-run and in the long-run. Implying that increasing the volume of industrial activities will reduce youth unemployment. The Granger causality test also showed that there exists a causal relationship between youth unemployment and industrialization in Nigeria.

Khalid, Rossanto, and Kabiru (2021) conducted a study to investigate the impact of financial development, energy consumption, industrialization, and trade openness on the economic growth of Indonesia from 1984 to 2018. The researchers utilized the Auto-regressive Distributed Lag (ARDL) model to estimate the long-run and short-run relationships among these variables. Additionally, they employed fully modified ordinary least squares (FMOLS), dynamics least squares (DOLS), and Canonical Co-integration Regression (CCR) to ensure the robustness of their findings. The results of the co-integration analysis confirmed the presence of a long-term relationship among the variables. According to the findings from the ARDL model, industrialization, energy consumption, and financial development (measured by domestic credit) had a positive impact on economic growth in the long run. However, financial development (measured by money supply) and trade openness exhibited a negative influence on economic growth. The positive relationship observed between industrialization, financial development, energy consumption, and economic growth indicates that these factors played a stimulating role in Indonesia's economic growth. The error correction term suggested an annual adjustment of 68% to restore equilibrium in the long-run economic growth rate following any deviation in the previous period. In conclusion, the study emphasizes the significance of industrialization and financial development for achieving sustainable long-term economic growth in Indonesia.

Cosmos and Josephine (2022) conducted a research study to examine the factors influencing industrialization in Africa using annual panel data from 1990 to 2018. To mitigate issues of endogeneity, the researchers employed the Two-Stage Least Square (TSLS) approach to estimate the

significant determinants of industrialization. The results revealed that foreign direct investment, total natural resources, and financial development significantly and positively predicted industrialization. On the other hand, trade openness had a significant and negative impact on industrialization. The study did not find human capital and inflation to be significant determinants of industrialization. Furthermore, the findings highlighted the importance of synchronizing public policies in external engagements as a crucial factor for an economy's ability to industrialize. Therefore, the researchers recommended that African governments should focus on increasing foreign direct investment, preserving and exploring natural resources, and enhancing financial development to leverage the benefits and contributions of industrialization.

Effiong and Ekong (2022) aimed to examine the influence of the financial sector on industrialization in Nigeria from 1981 to 2019. The study specifically investigated the effect of financial sector development on industrialization and explored the impact of industrialization on Nigeria's economic growth. The researchers collected data from the Central Bank of Nigeria Statistical Bulletin and the World Development Indicators. Various statistical tests, including the Augmented Dickey-Fuller unit root test, Auto-regressive Distributed Lag (ARDL) Bounds test for co-integration, and Error Correction Model, were employed for analysis. The unit root test revealed that the variables were stationary at mixed order of levels $I(0)$ and first difference $I(1)$, necessitating the use of the ARDL Bounds test for analyzing the relationship at the levels. The results indicated a negative effect of financial sector development on industrialization, as well as a negative and significant impact of deindustrialization on economic growth. The ARDL Bounds test for co-integration confirmed the existence of a long-run equilibrium relationship between financial sector development and industrialization, as well as between industrialization and economic growth in Nigeria. The ECM revealed that 56.98% of the short-run distortions in industrial productivity is corrected annually so that equilibrium is restored in the long run; while 93.06% of the short-run distortions in economic growth is corrected annually.

Oyebanji, Aderounmu, and Ewert (2022) investigated the impact of industrialization on the growth of the Nigerian economy. This study was motivated by the existence of different results from existing empirical studies in Nigeria compared to other developing countries. Johansen cointegration and Granger causality tests were used to determine long-term relationships and causal relationships between variables. Real gross domestic product was used as the dependent variable as a parameter for economic growth, and industrial production was used as the independent variable to measure industrialization. The results showed that industrial production has a large direct impact on real gross domestic product, with a total impact of 86%. A unidirectional causal relationship between

industrial production and real GDP was also found. This meant that fund managers, international traders, policy makers, business strategy and policy makers should pay attention to the dynamics of Nigeria's industrialization.

Li, Hu, and Zhao (2023) investigated the impact of industrial green development and technological innovation on China's employment structure. Data from 30 Chinese provinces from 2009 to 2019 were used to assess the level of industrial green development. This study innovatively integrates industrial green development, technological innovation, and employment structure into the analytical framework, and empirically investigates the influence of the two factors on employment structure and their interaction by applying a two-way fixed-effect model. We are investigating. The specific conclusions are as follows. First, China's industrial green development level has the characteristics of fluctuating and evolving over time, and there are regional differences. Second, industrial green development, technological innovation, and their interaction will contribute to the optimization of China's employment structure. Third, we will promote the optimization of the employment structure in the eastern and northeastern regions through industrial green development. Technological innovations in the Northeast, East and West regions will help improve the employment structure. Rather, the employment structure is influenced by technological innovation in the central region. The interaction of industrial green development and technological innovation has a positive impact on the relevant employment structure of the four regions. The concrete results of this study have the necessary theoretical significance and provide a realistic reference price on whether the green development and interaction of industries will affect the employment structure.

The empirical studies reviewed portray the fact that numerous studies focus on the influence of industrialization on economic growth while very few consider employment generation. Consequently, this paper fills this gap by exploring the influence of industrialization on employment creation in Nigeria.

3. Research Methodology

3.1. Model Specification

In order to appropriately study the impact of industrialization on employment creation in Nigeria, the modified model of Atan and Effiong is employed. The model is specified as follows:

$$UNE = f(ISO, GFCF, FDI, MSPS, GEES, INF) \dots\dots (1)$$

Where:

UNE = Unemployment rate (%)

ISO = Industrial Sector Output (% of GDP)

GFCF = Gross Fixed Capital Formation (% of GDP)

FDI = Foreign Direct Investment (Net Inflows, % of

GDP)

GEES = Government Expenditure on Economic Services (% of Total Government Recurrent Expenditure)

MSPS = Monetary Sector Credit to the Private Sector (% of GDP)

INF = Inflation Rate (%)

The model is written in its econometric form below:

$$UNE_t = \beta_0 + \beta_1 ISO_t + \beta_2 GFCF_t + \beta_3 FDI_t + \beta_4 GEES_t + \beta_5 MSPS_t + \beta_6 INF_t + \mu_t \dots\dots\dots(2)$$

The parameters to be estimated are $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$; t is time and μ is the error term.

3.2. Sources of Data

As it concerns this study, secondary source of data is relied upon. The study relies on Central Bank of Nigeria (CBN) Statistical Bulletin and World Development Indicators (WDI). The sample period for the research will range from 1990 to 2022.

Table 3.1: Description of Variables and their Sources

Variables	Sources
Inflation Rate	CBN Statistical Bulletin
Gross Fixed Capital Formation	World Development Indicator (WDI)
Government Expenditure on Economic Services	CBN Statistical Bulletin
Trade Openness	Computed as a ratio of total trade to GDP
Unemployment rate	World Development Indicator (WDI)
Foreign Direct Investment	World Development Indicator (WDI)
Industrial Sector Output	CBN Statistical Bulletin
Monetary Sector credit to the Private Sector	World Development Indicator (WDI)

Source: Researcher's Compilation

3.3. Techniques of Data Analysis

Unit Root Test

The Augmented Dickey-Fuller (ADF) unit root test is utilized in the study, and the test equation to be estimated is specified as follows:

$$\Delta y_t = \omega + \delta y_{t-1} + \sum_{i=1}^m \theta_i \Delta y_{t-i} + \mu_t \dots\dots\dots (3)$$

Where Δ is the first difference operator; y_t is a time series variable at current time (t); ω is the drift term; y_{t-1} is the one period lagged value of y_t ; δ is the coefficient of y_{t-1} ; $[\Delta y]_{t-i}$ is the lagged valued of the first difference of y_t ; m is the maximum lag length; θ_i is the coefficients of Δy_{t-i} ; and μ_t is the white noise error term. The null hypothesis is such that the time series contains a unit root which implies that $\delta=0$. The null hypothesis is rejected if δ is negative and statistically significant. The ADF unit root test is based on t-statistic test.

Hypothesis:

$H_0: \delta = 0$ (Variable has unit root i.e.; time series is non-

stationary)

H1: $\delta < 0$ (Variable do not have unit root i.e.; time series is stationary)

Decision Rule:

- (i) If $t^* >$ ADF critical value in absolute terms, reject the null hypothesis
- (i) If $t^* <$ ADF critical value in absolute terms, do not reject the null hypothesis

Note: t^* is the calculated value of the ADF unit root test.

Autoregressive Distributed Lag (ARDL) Approach

The method of data analysis employed is based of the specific objectives of the study. The ARDL analytical technique is used to analyze time series data that spans between 1990 to 2022.

The ARDL model coupled with the error correction model is specified as follows:

$$\begin{aligned} \Delta UNE_t = & \lambda_0 + \sum_{i=1}^p \lambda_1 UNE_{t-i} + \sum_{i=0}^q \lambda_2 ISO_{t-i} \\ & + \sum_{i=0}^q \lambda_3 GFCF_{t-i} + \sum_{i=0}^q \lambda_4 FDI_{t-i} \\ & + \sum_{i=0}^q \lambda_5 MSPS_{t-i} + \sum_{i=0}^q \lambda_6 GEES_{t-i} \\ & + \sum_{i=0}^q \lambda_7 INF_{t-i} + \delta ECT_{t-1} + \mu_t \dots (4) \end{aligned}$$

These coefficients, $\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6$ and λ_7 are estimated, p and q are the lag length, and ECT is the component of the error correction term, while δ represents the speed of adjustment of the model to long run equilibrium, and how fast it will take for the model to adjust to the long run equilibrium from the short run distortions.

Granger Causality

In line with the first objective, Granger Causality test was employed. This was to ascertain the nature of causation between industrialization and employment creation in Nigeria. Granger (1969- 1988) submitted that a time series X_t Granger-causes another time series Y_t if series Y_t can be predicted with better accuracy by using past values of X_t . If it can be shown that those X_t values provide statistically significant information about future values of Y_t time series then X_t is said to Granger-cause Y_t . The pairwise Granger Causality test is used in this study to determine whether industrial sector output causes employment creation or vice versa, and if a relationship exists, whether it is unidirectional or bidirectional, as well as the specifics of the direction of causality. The Granger Causality regression model for pairs is described as follows:

$$UNE_t = \theta + \sum_{i=1}^n \omega_i UNE_{t-i} + \sum_{i=1}^m \rho_i ISO_{t-i} + \varepsilon_t \tag{5}$$

And

$$ISO_t = \theta + \sum_{i=1}^n \varphi_i UNE_{t-i} + \sum_{i=1}^m \vartheta_i ISO_{t-i} + \varepsilon_t \tag{6}$$

Equations (5) and (6) represent the Granger causality equation, which offers a preliminary test of the order in which the two most important variables in our model— Unemployment rate and industrial sector output should be considered as well as other independent variables. This enables us to evaluate the causal relationship between Nigeria's Industrialization and Employment Creation, which is the study's first goal.

4. Empirical Findings

4.1. Trend of Unemployment Rate and Industrial Performance in Nigeria

The pictorial view of the performance of the industrial sector is presented in Figure 4.1 along with industrial sector output and public spending on economic services.

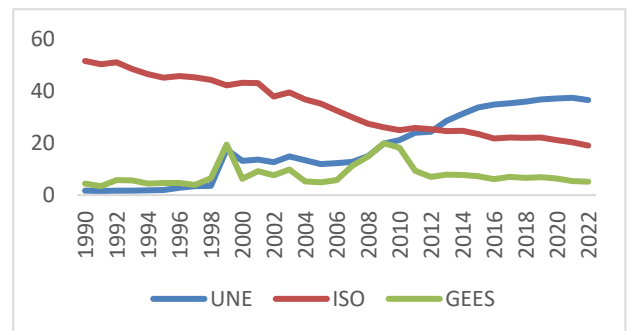


Figure 4.1: Unemployment Rate, Industrial Sector Output, and Government Expenditure on Economic Services. Source: Researcher's Computation (2023)

Figure 4.1 above presents the graphical trend analysis of unemployment rate (UNE), industrial sector output (ISO), and government expenditure on economic services (GEES) from 1990 to 2022. It can be seen from the diagram above that UNE experienced an upward trend during the period of study. In other words, UNE consistently increased from 1990 to 2022. Conversely, Industrial Sector Output (ISO) experienced a downward trend during the period of study. In other words, ISO consistently reduced from 1990 to 2022. Also, Government Expenditure on Economic Services (GEES) experienced a cyclical movement during the period of study.

4.2. Descriptive Statistics

This section presents the descriptive statistics of the various data of this study. The summary statistics are presented below:

Table 4.1: Summary Statistics

	UNE	ISO	GFCF	FDI	GEE S	MSP S	INF
Mean	17.95	33.84	28.09	1.58	7.82	10.33	18.18
Median	14.8	32.44	26.17	1.45	6.5	9.88	12.0
Maximum	37.3	51.42	53.12	5.79	19.91	19.63	76.76
Minimum	1.6	18.99	14.17	-0.04	3.41	4.96	0.22
Std. Dev.	12.97	10.86	11.23	1.22	4.28	3.5	16.78
Skewness	0.21	0.19	0.46	1.78	1.77	0.78	2.21
Kurtosis	1.65	1.48	2.13	6.72	5.19	3.36	7.14
Jarque-Bera	2.74	3.38	2.18	36.41	23.8	3.55	50.51
Probability	0.25	0.18	0.34	0.00	0.00	0.17	0.00
Observations	33	33	33	33	33	33	33

Source: Researcher’s Computation (2023)

The sample size is 33 which covers the period of 1990 to 2022. It can be seen from Table 4.1 that UNE averaged 17.95% during the study period and possess a minimum and maximum values of 1.6% and 37.3% respectively, ISO averaged 33.84% given its minimum and maximum values of 18.99% and 51.42% respectively. Similarly, FDI averaged 1.58% given its minimum and maximum values of -0.04% and 5.79% respectively. This same analogy is applicable to other variables. In addition, it is evident that all variables are positively skewed. Furthermore, UNE, ISO, GFCF, and SER are platykurtic, given that their kurtosis values are less than 3. On the other hand, GEES, MSPS, FDI and INF are leptokurtic, given that their kurtosis values are greater than 3. Further, FDI, GEES, and INF are normally distributed given that the Jarque-Bera statistic is statistically significant at 5% level.

4.3. Correlation Matrix

To ascertain the nature of the relationship among the variables in the model, the Pearson correlation coefficient is estimated and Table 4.2 presents the result.

Table 4.2: Correlation Matrix

	UNE	ISO	GFCF	FDI	GEE S	MSP S	INF
UNE	1						
ISO	-0.928	1					
GFCF	-0.739	0.866	1				
FDI	-0.497	0.382	0.253	1			
GEES	0.145	-0.249	-0.333	0.149	1		
MSPS	0.626	-0.769	-0.723	-0.065	0.586	1	
INF	-0.410	0.423	0.433	0.609	-0.302	-0.262	1

Source: Researcher’s Computation (2023)

Table 4.2 shows the correlation coefficient for the variables in the model. It is evident in Table 4.2 that each variable is perfectly correlated with itself implying the perfect correlation coefficient of 1. Also, UNE is negatively correlated with ISO, GFCF, FDI, and INF, implying that as these variables increases, UNE decreases. On the other hand, it is positively correlated MSPS and GEES, implying

that as these variables increases, UNE increases. The fact that UNE has a high correlation coefficient with ISO (-0.928) is an indication that ISO has a strong negative relationship with unemployment.

4.4. Unit Root Test

The unit root test is conducted for the variables in the model in order to ascertain the time series nature of the variables. This is done using Augmented Dickey Fuller (ADF) test and is presented below:

Table 4.3: Summary of ADF Test result

Variables	ADF t-Statistic	ADF p-Values	Level of Integration
UNE	-6.643948	0.0000	I(1)
ISO	-6.409688	0.0000	I(1)
MSPS	-5.279473	0.0010	I(1)
GFCF	-4.708063	0.0036	I(1)
INF	-3.846718	0.0282	I(0)
FDI	-3.921629	0.0230	I(0)
GEES	-6.798483	0.0000	I(1)

Source: Researcher’s Computation (2023)

Given the result above, the ADF test shows that the variables are stationary at level and after first differencing. To put differently, the variables are characterized as I(0) and I(1) series. The above result is a prerequisite to adopt the ARDL analytical technique, hence, we present the ARDL Bounds test to ascertain whether or not a long run relationship exists among the variables used in the model.

4.5. ARDL Bounds Test

The ARDL Bounds test was used to ascertain the whether there exists a long run relationship between the variables in the model. This test is only best for variables that are integrated at mixed orders of I (0) and I (1). This test is presented below:

Table 4.4: ARDL Bounds Test Result

T-Statistic	Value	Significance Level	I(0)	I(1)
F-statistic	12.96053	10%	1.99	2.94
k	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Researcher’s Computation (2023)

The Table 4.4 above shows that the F-Statistic is given by 12.96053 which is greater than the upper and lower bounds at 10%, 5%, 2.5% and 1% level of significance. This implies that the variables in are bound by a long run relationship. To put in another word, the variables in the model are tied to a long run relationship. This necessitates the study to carry out an ARDL long run estimate to ascertain how the various explanatory variables impact on the dependent variable.

4.6. The Long Run Estimate of ARDL

The long run regression results to ascertain the influence of industrialization on employment generation is presented in Table 4.5 below.

Table 4.5: ARDL Long Run Estimates

Variable	Coefficient t	Std. Error	t-Statistic	Probability
ISO	-1.9170	0.2248	-8.5275	0.0001
GFCF	-0.5444	0.1263	-4.3103	0.0050
GEES	2.9248	0.4971	5.8838	0.0011
MSPS	-5.5189	0.9939	-5.5523	0.0014
FDI	-8.7460	1.8832	-4.6441	0.0035
INF	0.5624	0.0939	5.9867	0.0010
C	137.2062	14.4712	9.4812	0.0001

Source: Researcher’s Computation (2023)

The long run estimates in Table 4.5 show that if all the variables are held constant, employment creation, as proxied by unemployment rate (UNE) will retain a value that equals the intercept (137.2062). The coefficient of the intercept term was computed to be significant. Also, it can be seen in Table 4.5 that industrial sector output (ISO) has a negative impact on unemployment rate in the long run. This implies that industrialization aids in stimulating employment generation in the long term. Given its coefficient and probability values of -1.9170 and 0.0001 respectively, a 1% increase in ISO will bring about a 1.917% decrease in unemployment rate in the long run and it was statistically significant at 5% significance level since its probability value was less than 0.05. Also, Gross Fixed Capital Formation (GFCF) was seen to have a negative impact on UNE in the long run. Given its coefficient and probability values of -0.5444 and 0.0050 respectively, a 1% increase in GFCF will bring about a 0.5444% decrease in GFCF in the long run and it was computed to be statistically significant at 5% significance level. Conversely, Government Expenditure on Economic Services (GEES) was seen to earmark a positive impact on UNE in the long run. Given its coefficient and probability values of 2.9248 and 0.0011 respectively, a 1% increase in GEES will bring about a 2.92% increase in UNE in the long run and it was statistically significant. Moreover, a 1% increase in Monetary Sector credit to the Private Sector (MSPS) will bring about a 5.52% significant decrease in UNE in the long run, given its coefficient and probability values of -5.5189 and 0.0014 respectively. Similarly, a 1% increase in Foreign Direct Investment (FDI) will bring about an 8.75% significant decrease in UNE in the long run, given its coefficient and probability values of -8.7460 and 0.0035 respectively. Lastly, a 1% increase in Inflation (INF) will bring about a 0.56% increase in UNE in the long run, given its coefficient and probability values of 0.5624 and 0.0010 respectively.

4.7. Autoregressive Distributed Lag (ARDL) Short Run Result

In the short run, Table 4.6 presents the short run error correction model to check the dynamic influence of industrialization on employment generation in Nigeria.

Table 4.6: Autoregressive Distributed Lag (ARDL) Error Correction Model Result

Variables	Coefficient	Std. Error	t-Statistic	Probability
D(ISO)	-0.3739	0.0866	-4.3161	0.0050
D(GFCF)	-0.2896	0.0396	-7.3047	0.0003
D(GEES)	0.8226	0.0425	19.3437	0.0000
D(MSPS)	-0.5992	0.0805	-7.4410	0.0003
D(FDI)	-1.7713	0.1958	-9.0426	0.0001
D(INF)	-0.0197	0.0238	-0.8284	0.4391
CointEq(-1)*	-0.5947	0.0396	-14.9883	0.0000

R-Squared = 0.984203, Adjusted R-Squared = 0.964760, Durbin Watson Stat = 2.444932, Schwarz Criterion = -2.773083, Hannan-Quin Criterion = 2.233082

Source: Researcher’s Computation (2023)

Table 4.6 shows that the model is free from first order autocorrelation, following the fact that the Durbin Watson Statistic is 2.44. Also, the table indicates that the dynamic model is a good fit as represented by the R-squared value of 0.9842. The R-Squared value indicates that approximately 98.42% variations in the unemployment rate is explained by the independent variables. It is also important to peruse the coefficient of the error term as well as its significant level. From Table 4.6, it is evident that the coefficient of the error term carries the correct sign (negative) and is statistically significant at 5%. The result shows that the model will correct itself at a speed of approximately 59.47% (in the current year) from the short run to the long run equilibrium if there were any disequilibrium between UNE and the explanatory variables.

The short-run estimates of the model indicate that changes in industrial sector output exerts a negative and significant short run effect on unemployment rate in Nigeria. Consequently, a 1% increase in industrial sector output is associated with a 0.3739% decline in unemployment on the average. This is a clear indication that industrialization fosters employment generation in Nigeria. Also, gross fixed capital formation exerts a negative and significant short run effect on unemployment, implying that increased capital stock through investments can reduce the level of unemployment. From the coefficient, a 1% increase in the stock of capital is associated with a 0.2896% decline in the rate of unemployment in Nigeria.

Changes in government expenditure on economic services (GEES) is noted to put forth a positive and significant short run effect on unemployment during the study period. The implication here is that a rising GEES is associated with an increasing unemployment rate during the study period. It therefore follows that GEES could not in any way reduce unemployment during the study period. Following the coefficient, a 1% increase in GEES is

associated with a 0.8226% increase in unemployment on the average. Changes in the monetary sector credit to the private sector (MSPS) and foreign direct investment inflows (FDI) are observed to exert negative and significant short run influence on unemployment rate. This imply that the two variables aided in reducing the rate of unemployment during the study period. From their coefficient, a 1% increase in MSPS and FDI will lead to a 0.5992% and 1.7713% decrease in unemployment during the study period. Though changes in the rate of inflation exerts a negative effect on unemployment, such is not significant.

4.8. Granger Causality Test

In order to ascertain the nature of the causal relationship between industrialization and employment generation, Table 4.7 presents the Granger causality test result.

Table: 4.7: Results of Granger Causality Test

Null Hypothesis	Observations	F-Statistic	Probability
ISO does not Granger Cause UNE	32	6.4856	0.0164
UNE does not Granger Cause ISO	32	0.2525	0.6191

Source: Researcher’s Computation (2023)

Table 4.7 shows the causal relationship between the variables. It is evident above that there is a unidirectional relationship between industrial sector output (ISO) and unemployment rate. This is because F-statistic of 6.4856 for the first null hypothesis is significant, while that of the second null hypothesis being 0.2525 is insignificant. Thus, only industrialization causes unemployment and not unemployment causing industrialization.

4.9. Stability Test

Cumulative Sum of Square (CUSUM) and Cumulative Sum of Square Residual (CUSUMQ) is conducted so as to ascertain the stability of the parameter estimates of the model. Figure

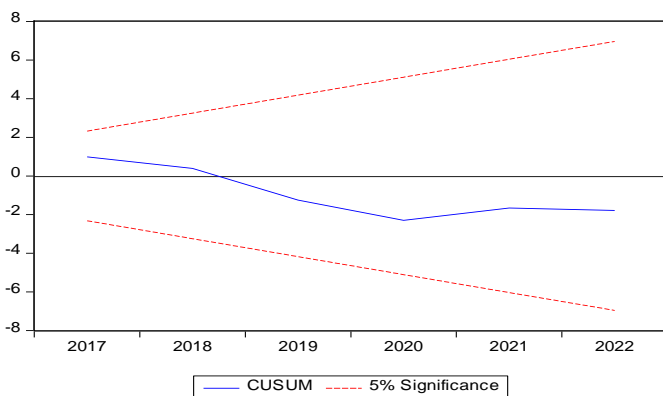


Figure 4.2: Cumulative Sum of Square (CUSUM)

Source: Researcher’s Computation (2023)

Figure 4.2 avails that the recursive errors lie in-between the critical line at 5% significance level. This shows that the residual variance is stable. Consequently, the parameter estimates are stable and are reliable for policy simulations.

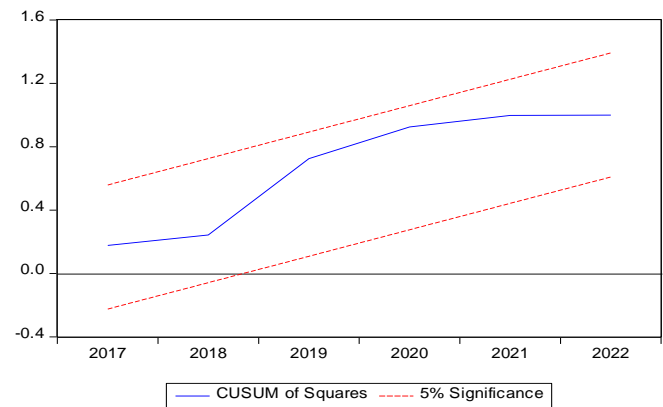


Figure 4.3: Cumulative Sum of Square Residual

Source: Researcher’s Computation (2023)

Succinctly, looking at the CUSUMQ test result in Figure 4.6, it can be deduced that the recursive error falls in-between the critical line at 5% significance level. This result shows that the model is stable and is reliable for prediction.

5. Summary and Recommendations

This study has evaluated the impact of industrialization on employment creation in Nigeria using data that ranges from 1990 to 2022. The study adopted a combination of qualitative and quantitative techniques for data analysis by describing the variables using graphs and presenting an econometric analysis of the data. The specific objectives that the study achieved include examining the impact of industrial sector performance (ISO) on employment creation, which is measured by changes in the unemployment rate (UNR), and examining the causal relationship between industrial sector performance and employment creation in Nigeria. The econometric analysis that was carried out included the descriptive statistics of the variables as well as their correlation matrix; the Augmented Dickey Fuller test was used to test for the stationarity of the variables; the ARDL co-integration test; the ARDL long run test; and the ECM were all used to investigate the relationship between the variables. The Granger causality test was used in order to examine the causal relationship between the variables.

The data for the analysis came from secondary sources gotten from the Central Bank of Nigeria's (CBN) Statistical Bulletin and World Development Indicators (WDI). The ARDL Bounds test for both indicates that a significant long-run relationship exists between the unemployment rate and industrial sector output. The findings of the study indicated that industrialization exerted a negative and significant effect on unemployment during the study period. Thus, an increased level of industrialization is associated with increased employment opportunities, which equates to a reduced level of unemployment. The Granger causality test indicates that there is a unidirectional relationship between industrial sector output (ISO) and the unemployment rate (UNR), with industrial sector output causing

unemployment. In terms of gross fixed capital formation, the negative relationship it exhibited with the unemployment rate suggests that as businesses invest more in capital equipment, unemployment tends to decrease. This implies that industrialization, which often involves increased investment in capital equipment, can contribute to job creation.

The finding that foreign direct investment has a negative relationship with the unemployment rate implies that foreign investments in industrial sectors are creating jobs in Nigeria. Overall, the results of this assessment highlight the importance of industrialization in driving employment creation in Nigeria and suggest that efforts to support the growth and development of the industrial sector could be an effective way to reduce the unemployment rate in the country. It will be important for policy makers to consider these findings when designing and implementing economic development strategies in the future.

Based on the above assessment of the impact of industrialization on Nigeria's employment creation, there are several recommendations that could be made to support employment creation and stimulate economic growth in the country.

- i. Given that the industrial sector had a negative and significant impact on the unemployment rate, the government should encourage the growth and diversification of the industrial sector, including manufacturing, to create more job opportunities. Also, improving infrastructure, such as transportation, energy, and logistics, will support industrial development and make it easier for businesses to operate and expand.
- ii. In addition, given that foreign direct investment had a negative and significant impact on the unemployment rate, the government should review and reform labor market policies to ensure that local labor forces have the necessary skills and qualifications to meet the demands of FDI projects. Invest in training and education programs to bridge skill gaps.
- iii. Lastly, the government should encourage a diversified approach to investment, balancing investments in capital-intensive industries with those in labor-intensive sectors to maintain a balance between productivity and employment.

Acknowledgment

We would like to express our gratitude to the journal editor and the anonymous reviewers for their valuable comments and suggestions that significantly improved the quality of this manuscript.

References

- Abubakar, S. & Hitlar, I. (2018). Industrialization and the Quest for Economic Diversification in Nigeria (1970-2017). *The Journal of Economic and Allied Field*, 6, 11-21.
- Afolabi, J. & Ogunjimi, J. A. (2020). Industrialization: A Roadmap to Inclusive Growth in Nigeria. *Economic and Policy Review Journal*, 18(1), 20-28.
- Akinbola, O. A., Zekeri, A., & Idowu, H. A. O. (2017). The power sector and its impact on industrialization of business in Nigeria. *Archives of Business Research*, 5(12), 294-305.
- Atan, J. A., & Effiong, U. (2020). Industrialization and Youth unemployment in Nigeria: An Autoregressive Distributive Lag (ARDL). *International Journal of Business and Economic Research*, 9(5), 334-334.
- Cosmos, A. (2022). Factors driving Industrialization in Africa: A panel two-stage least square Approach. *Modern Economy*, 13(2).
- Effiong, U. E. (2022). Industrial Policies and Industrial Sector Performance in Nigeria. *Asian Journal of Economics, Finance and Management*, 7(2), 24 - 45. Available at <https://globalpresshub.com/index.php/AJEFM/article/view/1531>
- Effiong, U. E., & Ekong, C. N. (2021). Global Trends in Financial Sector-Led Industrialization: How did Nigeria Fare? *Asian Journal of Economics, Finance and Management*, India, 5(4), 184 - 207. Available at <https://globalpresshub.com/index.php/AJEFM/article/view/1415>
- Felix, P. S. (2019). The Role of Infrastructure in Industrialization in a Developing Economy: The Case of Electricity Supply And Education in Nigeria. In *Industrial Development; A catalyst for rapid Economic Growth* (pp. 144-163).

- Godfrey, E. B. (2011). The impact of industrialization output on Economic growth of Nigeria.
- Holis, B. (1999). The Impact of Industrialization and Economic Growth and Development in Nigeria.
- Li, Y., Hu, M., & Zhao, L. (2023). Study on the impact of industrial green development and technological innovation on employment structure.
- Marcus, N., Chinedu, N., & Amachukwu, O. (2017). Industrialization and Economic Growth in Nigeria. *American International Journal of Research in Humanities Arts and Social Sciences*, 18(2), 168-179.
- Ndiaya, C., & Kangjuan, L. (2018). Role of industrialization on economic growth: The experience of Senegal (1960-2017). *American Journal of Industrial and Business Management*, 08(10), 2072-2085. <https://doi.org/10.4236/ajibm.2018.810137>
- Ogbimi, F. E. (2007). Promoting Sustainable Economic Growth and Industrialization: Solution To Mass Unemployment and Poverty. *African Journal of Traditional and Complementary Medicine*, 4(4), 541-552.
- Olusoji, M. O., & Oderinde, L. O. (2011). Fiscal Deficit and Inflationary Trends in Nigeria: A Cross-Causal Analysis. *Journal of Economics Theory*, 5(2), 37-43.
- Oyebanji, J. I., Aderounmu, A. O., & Ewert, P. J. (2022). Impact of Industrialization on Economic Growth in Nigeria. *Journal of Economic and Financial Sciences*, 15(1), 2312-2803.
- Peter, E. A. (2019). An Empirical Analysis of the Impact of Foreign Direct Investment and Industrial Sector Performance on Nigerian Economy. *European Journal of Business and Management*, 11(11), 2222-2839.
- Todaro, P. M., & Smith, S. C. (2016). *Economic Development (Eleventh Edition)*. UK: Pearson.

Cite this article as: Ubong Edem Effiong & Ubong Ekerete Udonwa (2024). [Industrialization and Employment Generation in Nigeria: An Empirical Analysis](#). *African Journal of Commercial Studies*. 4(1),17-30. doi: 10.59413/ajocs/v4.i1.2