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INDUSTRIALIZATION AND JOB CREATION: EMPIRICAL EVIDENCE FROM NIGERIA

[1]Dr. Clement Korgbeelo and [2]Ndudi Joshua Odoyi

[1]Department Of Economics, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt

[2]Department Of Economics, School of Post Graduate Studies, Ignatius Ajuru University of Education, Rumuolumeni, Port Harcourt

Phone No: *+2348064529412;* ***Email:*** *clementkorgbeelo@gmail.com*

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Abstract: A country's industrial sector undoubtedly contributes to job creation. Over the years, Nigeria has been experiencing high and rising levels of unemployment despite several efforts by successive governments to revamp the industrial sector. This study examined the role of industrialization in job creation in Nigeria. Specifically, the study investigated the impact of manufacturing sub-sector output, mining and quarrying sub-sector output, utility sub-sector output, construction sub-sector output, and labour force on unemployment rate in Nigeria. Labour force was introduced as a control variable. Annual time-series data from 1981 to 2023 were used for the study. The data were obtained from the Central Bank of Nigeria annual statistical bulletin for 2023, the Central Bank of Nigeria annual reports and statements of accounts (various years), and the World Bank development indicators (various years). The Johansen cointegration test, error correction mechanism, and Granger causality test were used to estimate the data. The estimated regression results revealed that manufacturing sub-sector and construction sub-sector outputs insignificantly reduce unemployment while mining and quarrying sub-sector output, utility sub-sector output, and labour force insignificantly aggravate unemployment. The Granger causality test indicated unidirectional causalities from unemployment rate to utility sub-sector output and from unemployment rate to labour force. The study concludes that industrialization does not make any significant contribution to job creation in Nigeria. Based on the findings, the study recommends that there should be a general improvement in the country's macroeconomic environment and the provision of necessary infrastructural facilities so as to improve the performance of the industrial sector in terms of its contribution to job creation.

Keywords: Industrialization, Job-Creation, Unemployment

Introduction

Industrialization plays a significant role in the development of a country's economy. In fact, industrialization is the bedrock of economic development, as no country can develop without achieving a reasonable level of industrialization (Sunkad, 2021; Sankhala, 2023). Consequently, industrialization is often seen as a prerequisite for achieving sustainable development. It is therefore generally believed that the benefits of industrialization will trickle down to other parameters of development such as improvement in employment generation improved economic growth; reduction in poverty levels, improvement in standard of living through improved per capita income, etc (Wilson, 2002; Jhingan, 2016).

Industrialization has a huge potential for job creation. It provides employment opportunities outside agriculture for both the available skilled and unskilled labour (Effiong & Udonwa, 2024). An expansion in a country's industrial capacity to produce goods creates increased demand for labour. As firms in the industrial sector produce more goods, they will typically hire more labour to help them meet their output targets and customers' expectations. Higher productivity in the industrial sector means higher profitability which will enable the firms to establish multiple production facilities, all of which require more employees (Adeniyi, 2021).

Over the years, Nigeria has been experiencing high and rising levels of unemployment. This has mostly been attributed to rapid population growth and the inability of the productive capacity of the economy to adequately absorb the ever-expanding workforce. The high rate of unemployment among the youths in Nigeria has contributed to the high rate of poverty and insecurity in the country (Ajufo, 2013; Kayode et al, 2014). The International Labour Organisation (ILO) has linked unemployment in Nigeria to the phenomenon of a jobless growth economy, increased number of school graduates with no matching job opportunities, a moratorium on employment in many public and private sector institutions, and continued job losses in several sectors of the economy (Kakwagh & Ikwuba, 2010).

As earlier pointed out, the industrial of a country has the potential to create job opportunities to reduce unemployment. However, in the case of Nigeria, the performance of its industrial sector has not been quite satisfactory over the years. The sector has been characterized by high import content of industrial inputs, especially machineries, dwindling capacity utilization, low value – addition, inadequate linkages with other sectors of the economy, etc. (Obioma & Ozugahalu, 2005). Wilson (2002) equally identified several problems militating against the development of the Nigerian industrial sector to include low capital base, insufficient managerial and entrepreneurial capability, smallness of the market due to the prevalence of low income, inadequate infrastructural facilities, among others. Consequently, the performance of the sector, in terms of its contribution to gross domestic product (GDP) and job creation, has not been encouraging. To overcome the problems bedevilling the industrial sector and put it on the path of sustainable growth and development, successive governments in Nigeria have put in place several policies, programmes and incentives. These include the implementation of various strategies of industrialization; creation of several packages of incentives such as tax holiday, tariff protection, import duty relief, provision of loans and export incentives. Others include establishment of industrial estates, manpower development and skills acquisition programmes, formulation of the Nigerian industrial revolution plan, etc. In spite of all these efforts, the fortunes of the industrial sector, especially, its capacity to create jobs, keep deteriorating (Anyanwu et al, 1997; Wilson, 2002; Banjoko et al, 2012).

From the discussion so far, it is clear that Nigeria is experiencing severe unemployment problem particularly, among the youths. It is also suggestive that the performance of the industrial sector, in terms of job creation is not quite satisfactory. It is therefore necessary to find out the actual impact of industrialization on unemployment in Nigeria. This will provide empirical evidence with which appropriate measures will be taken to address the unemployment problem in the country.

2. Literature Review

2.1 Conceptual Clarification

2.1.1 Industrialization

Industrialization has been defined in several ways. Jhingan (2016) defines industrialization as "the process of manufacturing consumer and capital goods and of creating social overhead capital in order to provide goods and services to both individuals and businesses". Similarly, Anyanwu et al (1997) define industrialization as "the

process of building up a nation's capacity to convert raw materials and other inputs to finished goods and to manufacture goods for other production or for final consumption". For the purpose of this study, the level of industrialization is defined in terms of output performance of the industrial sector which is disaggregated into the output performance of the various components that make up the industrial sector. Therefore, for this study, industrialization is defined as the improvement in the output performance of the manufacturing, mining and quarrying, utility, and construction sub-sectors.

2.1.2 Job Creation

Job creation is defined as the ability to generate employment opportunities so as to reduce unemployment in a country. Hence, for this study, job creation is measured in terms of the capacity of the industrial sector to create jobs so as to reduce the rate of unemployment in Nigeria. Unemployment on its part refers to individuals who are employable (i.e., able to work) and seeking for a job at the prevailing wage rate, but are unable to find one (Ohale & Onyema, 2002). Thus, unemployment is defined as the number of persons within the working age bracket who are willing and able to work at the prevailing wage rate, but cannot find a job.

The unemployment rate refers to the number of persons considered unemployed expressed as a percentage of the total labour force.

That is, unemployment rate = $\frac{Number\ of\ Unemployed\ Persons}{Total\ Labour\ Force}$ x $\frac{100}{1}$

2.1.3 An Overview of Nigeria's Unemployment Situation

Unemployment is not a recent challenge in Nigeria. The annual national unemployment rate rose from 4.3 percent in 1970 to 6.4 percent in 1980. It declined to 4.3 percent in 1982 and then increased to 6.4 percent in 1983. From its value in 1983, the annual national unemployment rate declined to 5.3 percent in 1986. It however increased to 7.5 percent in 1987.

The Structural Adjustment Programme (SAP) which was introduced by the Federal Government of Nigeria in 1986 was meant to address several macroeconomic imbalances in the country. Probably due to the beneficial effects of the programme, the immediate post-SAP period witnessed a reduction in the unemployment rate. Hence, the unemployment rate fell from 7.0 percent in 1987 to as low as 1.9 percent in 1995. It thereafter rose to 17.5 percent in 1999 (Akintoye, 2008; Njoku & Ihungba, 2011).

Data from the Central Bank of Nigeria indicate that the national unemployment rate declined from its value in 1999 to 12.6 percent in 2002 and then rose to 14.8 percent in 2003. However, it fell to 11.9 percent in 2005 and thereafter took an upward trend to 19.7 percent in 2009. It fell abruptly to 5.1 percent in 2010 and then maintained an upward trend to 22.6 percent in 2018. The increase in the unemployment rate, particularly from 2015 to 2018 was largely due to the fact that the economy plunged into recession in 2016 (Ministry of Budget and National Planning, 2017). The unemployment rate fell from 22.6 percent in 2018 to 8.1 percent in 2019 and increased to 14.35 percent in 2020, fell to 13.44 percent in 2022, and then fell to 5.3 percent in2023 following NBS adoption of new ILO methodology for capturing employment data in April, 2023.

2.1.4 Performance of the Nigerian Industrial Sector: An Overview

The industrial sector in Nigeria effectively started about 1955, with multinational firms formally engaged in wholesales activities. Since independence, the performance of the Nigerian industrial sector has not been quite impressive. It has been a mixture of initial mild growth and subsequent retrogression. There were relatively satisfactory growth levels during the colonial era up to the first decade after independence. For instance, during the early 1960s up to the mid-1970s, the Nigerian government undertook certain policy measures to boost

industrial production in the country. Consequently, there was a rapid growth of industrial capacity and output. There was also an increase in the relative importance of the manufacturing sub-sector. Thus, for the period 1960-1975, the share of industrial sector in total GDP averaged 22.3 percent. The manufacturing sub-sector contributed an average of 30.4 percent of the total industrial sector output and 6.8 percent of the total GDP during the same period (Dagogo, 2014; CBN, 2019).

For the period 1976-1985, the industrial sector's average share of total GDP was 30.6 percent. This was an improvement over the 1960-1975 period. Similarly, the manufacturing sub-sector contributed 9.0 percent of the total GDP. This was also an increase over the 6.8 percent recorded for the period 1960-1975. However, there was a slight decline in the share of manufacturing in the total industrial output as the manufacturing sub-sector recorded an average of 29.5 percent of the total industrial output for the period (CBN, 2010; CBN, 2019). The slight poor performance of the manufacturing sub-sector in terms of its contribution to total industrial sector output was mainly as a result of the oil price collapse at the international oil market. Due to the negative effects of the oil glut on government revenue, the government introduced several import duties and other quantitative restrictions on the importation of certain items. This adversely affected the manufacturing sector, as manufacturers found it difficult to get raw materials and spare parts needed for production. Consequently, manufacturing capacity utilized declined (Ku et al, 2010; Banjoke et al, 2012).

In 1986, the Structural Adjustment Programme (SAP) was introduced as an economic revival strategy. Consequently, as a result of the positive response of the industrial sector to the policies implemented during the SAP era, the sector witnessed a significant improvement in its contribution to the country's GDP for the period 1986-1999, as the share of the industrial sector stood at an average of 40.6 percent. The performance of the manufacturing sub-sector however declined, as its contribution to the total industrial sector output and total GDP averaged 13.0 percent and 5.3 percent respectively (Odozi; 1998; Bamidele, 2005; Ajayi, 2007; Ekpo, 2014).

During the period 2000 – 2009, the industrial sector's share of total GDP averaged 38.4 percent. This was a slight decrease over the 1986-1999 value. In the same manner, the contribution of the manufacturing sub-sector to the total industrial output declined to 7.2 percent while the contribution of the manufacturing sub-sector to total GDP declined to 2.8 percent. For the period 2010 to 2019, the share of the industrial sector to total GDP averaged 23.67 percent while the shares of the manufacturing sub-sector in the total industrial output and total GDP averaged 33.77 percent and 8.0 percent respectively (CBN, 2019). During the period 2020-2023, the contribution of the industrial sector to total GDP averaged 20.11 percent. This is lower than the proceeding period'S value of 23.67 percent. However, the share of the manufacturing sub-sector in total industrial output increased to 44.18 percent while its share in total GDP increased marginally to 8.9 percent during the period (CBN, 2023).

With regards to the contribution of the industrial sector to employment in Nigeria, the industrial sector share of total employment averaged 8.9 percent for the period 1991-2017. The share of industrial sector in Nigeria's total employment recorded an all-time low of 8.01 percent in 2002 for the period 1991-2017. From its value in 2002, the contribution of the industrial sector to total employment rose to 14.16 percent in 2010. It declined to 10.15 percent in 2011 and then rose to 12.45 percent in 2015. From its in 2015, the share of the industrial sector in total employment rose to 14.56 percent in 2022 (World Bank, 2024).

2.2 Theoretical Literature Review

The Structural Transformation Theory

The structural transformation theory, also called the structural change theory, is concerned with the process through which underdeveloped countries transform their domestic economic structures from a heavy emphasis on traditional subsistence agriculture to a more modern, more urbanized and more industrially diverse manufacturing and service economy (Abenyo, 2020). Contributors to the structural transformation theory include

Fischer (1939), Clark (1940), Lawis (1954), Kaldor (1957), Kuznets (1957), Chenery (1979), etc. However, for this study, the Lewis (1954) theory of economic development with unlimited supplies of labour is considered more appropriate.

William Arthur Lewis explained the development of a less developed economy in terms of labour transition from the traditional agricultural sector to the modern industrial sector. According to Lewis (1954), the traditional agricultural or indigenous sector is characterized by unlimited supply of labour with low or sometimes, even zero marginal productivity. In this sector, land is limited and mainly used for agricultural production such as grains, etc. Wage in this sector is rated at the subsistence level (Kindleberger, 1988; Gabardo et al, 2017). On the other hand, the modern, manufacturing, industrial or capitalist sector is said to be expansionary in nature. The main motive in this sector is to maximize profit by charging a price higher than the set wages. The wage rate that is provided in the industrial sector is fixed and is higher than what is provided in the traditional agranian sector. As a result, the wage rate serves as an incentive for labour to migrate from the agricultural sector to the industrial sector (Jhingan, 2016; Chriswick, 2018). Therefore, as long as surplus labour exists in the economy, any amount labour will be available to the modern industrial sector at the given constant wage rate. Lewis assumes that all wages are consumed and all profits saved and reinvested. Consequently, when the capitalists reinvest their profits by setting up new factories or expanding existing ones, the stock of capital assets in the modern sector will increase. As a result of the increase in the stock of industrial capital, the demand for labour or the marginal productivity curve of labour will shift outwards (Kindleberger, 1988).

As the modern sector expands, employment and output increase and the share of profits (savings) in national income rises. Eventually, as surplus labour is exhausted, the wage rate rises. At this point, the economy crosses the boundary from a dual labour market to a single integrated labour market, and real wages rise with increasing productivity, in accordance with conventional growth model (Chrisswick, 2018).

The Lewis theory has been criticized on several grounds. For instance, the assumption that the wage rate will remain constant in the industrial sector until the supply of labour is exhausted from the traditional sector seems quite unrealistic since the wage rate continuously rises overtime in the capitalist sector. Also, the theory has been considered a one-sided theory since Lewis did not consider the likelihood of progress in the agricultural sector. However, inspite of the criticisms against the theory, Lewis has put forward a deep and perceptive analysis of the various problems of underdeveloped economies (Wang & Piesse, 2009).

2.3 Empirical Literature Review

Effiong and Udonwa (2024) examined the impact of industrialization on employment creation in Nigeria and established that industrial sector output has significant negative impact on unemployment rate. Owan et al (2024) investigated the impact of manufacturing sector output on employment in Nigeria. Among other things, the findings from the study indicated that manufacturing share of total GDP and total investment have significant positive impact on manufacturing sector employment while manufacturing value-added has insignificant negative impact on manufacturing sector employment. Ngozi et al (2023) found that total industrial sector output has insignificant negative impact on unemployment rate while manufacturing sector output has significant positive impact on unemployment rate in Nigeria. Habanabakize and Dickason-Koekemoer (2023) studied the role of industrialization in employment and economic growth in South Africa. The findings revealed that clothing production, food and beverage production, metal production and automotive production all have insignificant positive impact on employment while chemical production has insignificant negative impact on employment. Tizhe et al (2022) examined the impact of manufacturing sector performance on employment creation in Nigeria

and found that manufacturing GDP growth rate has negative impact on manufacturing employment. Mushtaq et al (2022) established that industrial value-added and economic growth lead to more employment creation while population growth reduces employment creation in a panel of 26 Asian countries. Atan and Effiong (2020) in their study, found that industrial sector output, broad money supply and government expenditure on economic services have significant negative impact on youth unemployment in Nigeria. Similarly, Adu et al (2019) established significant negative impact of industrial sector output on unemployment rate in Nigeria.

Furthermore, Ugbaka and Abayomi (2018) showed that industrial capacity utilization and GDP have significant positive impact on unemployment rate in Nigeria. In a similar study, Olusoji and Oderinde (2017) found that industrialization (proxied by manufacturing value-added) has insignificant positive impact on employment generation while economic growth has significant positive impact on employment generation in Nigeria. Ewubare and Obayori (2015) in their study on the impact of real sector performance on unemployment in Nigeria, established that index of industrial production and index of agricultural production have insignificant negative impact on unemployment.

From the empirical literature reviewed, it is observed that there are few studies that investigated the impact of industrial sector performance on job creation or unemployment in Nigeria. It is also observed that the findings of previous studies on the impact of industrial sector performance on unemployment in Nigeria are mixed. For instance, Ugbaka and Abayomi (2018), Obiseke et al (2021), and Tizhe et al (2022) showed that industrial sector performance worsens unemployment in Nigeria. On the other hand, Olusoji and Oderinde (2017), Adu et al (2019), Atan and Effiong (2020), Ngozi et al (2023), Owan et al (2024) and Effiong and Udonwa (2024) found that industrial sector performance reduces unemployment in Nigeria. In addition, the empirical literature reviewed revealed that none of the studies on the topic in Nigeria disaggregated the total industrial sector output into the outputs of the various components or sub-sectors of the industrial sector. The present study disaggregated the total industrial sector output into manufacturing sub-sector, mining and quarrying sub-sector, utility sub-sector and construction sub-sector outputs.

3. Method of Study

3.1 Model Specification

The model used for this study is specified in line with the Lewisian theory of economic development with unlimited supplies of labour and an adopted analytical model by Ewubare and Obayori (2015). The adopted model is expressed as follows:

UMP = f (NDP, AGD)

where UMP = Unemployment Rate

NDP = Index of Industrial Production

AGP = Index of Agricultural Production

f = Functionality Notation

The adopted model by Ewubare and Obayori (2015) was modidied so as to allow for the inclusion of the variables of the present study. Hence, the model used for this study is specified on its functional form as follows:

UNPR = f (MSO, MQSO, UTSO, CONSO, LABF) …… 2

where UNPR = Unemployment Rate

MSO = Manufacturing Sub-sector Output

MQSO = Mining and Qaurrying Sub-sector Output

UTSO = Utility Sub-sector Output

CONSO = Construction Sub-sector Output

LABF = Labour Force

f = Functionality Notation

UNPR is the dependent variable while MSO, MQSO, UTSO, CONSO and LABF are the independent variables. LABF was introduced as a control variable. The multivariate econometric equation based on the functional form of the model is expressed as follows:

$UNPR = \beta_0 + \beta_1 MSO + \beta_2 MQSO + \beta_3 UTSO + \beta_4 CONSO + \beta_5 LABF + U$ …… 3

where β_0 is the regression intercept, β_1, β_2, β_3, β_4, and β_5 are the parameter estimates of the explanatory variables and U is the random variable. All other variables are as earlier defined.

Based on logarithmic transformation, the econometric model can be expressed as follows:

$UNPR = \beta_0 + \beta_1 LOGMSO + \beta_2 LOGMQSO + \beta_3 LOGUTSO + \beta_4 LOGCONSO + \beta_5 LOGLABF + Ɛ$ …… 4

where LOG refers to the natural logarithm of the variables and Ɛ is the log-transformed random variable. All other variables are as earlier defined.

Apriori Theoretical Expectation

Based on the Lewesian variant of the structural transformation, the following signs of the parameter estimates are expected.

$\beta 1<0$, $\beta 2<0$, $\beta 3<0$, $\beta 4<0$, $\beta_5>0$

The implication of the above signs of the parameter estimates is that an increase in the output of each of the components of the industrial sector is expected to bring about a reduction in unemployment rate while an increase in labour force is expected to increase unemployment rate.

3.2 Description of the Variables

Dependent Variable

The dependent variable for this study is unemployment rate. It is defined as the number of persons considered unemployed expressed as a percentage of the total labour force in a year.

Independent Variables

i. **Manufacturing Sub-sector Output**

This is the total monetary value of the total output of goods produced by the manufacturing sub-sector in a year. It is measured in billions of naira.

ii. **Mining and Quarrying Sub-sector Output**

This refers to the monetary value of crude oil and natural gas, coal, metal ores and quarrying, and other minerals produced in Nigeria in a year. It is measured in billions of naira.

iii. **Utility Sub-sector Output**

This refers to the monetary value of electricity, gas, steam, air conditioner, water supply, sewage and waste management in Nigerian during a year. It is measured in billions of naira.

iv. **Construction Sub-sector Output**

This is the total monetary value of the output of the construction industry in Nigeria in a year. It is measured in billions of naira.

v. **Labour Force**

This is the total number of persons aged 15-60 years which constitute the working age population of Nigeria in a year. It is measured in millions of persons.

3.3 Nature and Sources of Data

This study made use of annual time-series data covering the 1981 to 2023. The data were secondary data sourced from the Central Bank of Nigeria (CBN) annual statistical bulletin, the CBN annual reports and statements of

accounts (various years), and the World Bank development indicators (various years). All the data were measured at the aggregative or national level.

3.4 Techniques of Data Estimation

The classical least squares technique assumes that time-series data are stationary. However, in practice, many macroeconomic time-series data are non-stationary. Therefore, to account for the properties associated with time-series data, the actual estimation procedure was proceeded by preliminary tests. Specifically, the estimation procedure used in conducting this study is explained as follows:

The stationary test was used to determine whether the time-series data are stationary or not. For this study, the stationarity test was conducted using the Augmented Dickey-Fuller (ADF) unit root test. Based on the result of the stationarity test, the Johansen cointegration test was used to check whether there exist long-run or equilibrium relationship among the variables of the study. The error correction mechanism (ECM) was used to examine the behaviour of the variables in the short-run. Specifically, the ECM was used to determine the speed with which any disequilibrium in the short-run is reconciled to a long-run equilibrium trend. Also, the Granger causality test was used to test the nature and direction of causality between the dependent variable and each of the explanatory variables.

4.1 Presentation of Results

4.1.1 Descriptive Statistics

The summary of the descriptive statistics result is presented in table 1.

Table 1: Descriptive Statistics Result

Variable	UNPR	MSO	MQSO	UTSO	CONSO	LABF
Mean	9.640476	4277.878	6633.942	162.8521	1189.681	45.28571
Median	8.550000	3584.520	6494.135	114.8850	769.5950	43.15000
Maximum	22.60000	6684.220	9323.750	503.8400	2680.220	73.40000
Minimum	1.900000	2898.470	4096.990	13.52000	335.7600	26.80000
Std. Dev.	5.739213	1347.255	1448.672	162.2552	853.3478	13.82895
Skewness	0.555608	0.765161	0.138884	0.639039	0.768479	0.422935
Kurtosis	2.277860	1.947278	2.103026	1.943217	1.915438	1.969893
Jarque-Bera	3.073502	6.037693	1.543004	4.812981	6.192400	3.109082
Probability	0.215079	0.048858	0.462318	0.090131	0.045221	0.211286
Sum	404.9000	179670.9	278625.6	6839.790	49966.59	1902.000
Sum Sq. Dev.	1350.481	74418894	86044640	1079397	29856299	7840.831
Observations	43	43	43	43	43	43

Source: E-view Output

From the descriptive statistics result in table 1, the mean values of the variables are 9.640476 percent, ₦4277.878 billion, ₦6633.942 billion, ₦162.852 billion, ₦1189.681 billion, and 45.28571 million for UNPR, MSO, MQSO, UTO, CONSO, and LABF respectively. The standard deviation statistic indicated that UNPR with a standard deviation value of 5.739213 is the most stable (least fluctuating) variable while MQSO with a standard deviation value of 1448.672 is the most unstable (most fluctuating) variable. The skewness statistic showed that all the variables are positively skewed. The kurtosis statistic revealed that all the variables are platykurtic since their values are less than 3. This suggests that all the variables have lighter or thinner tails relative to normal distribution.

4.1.2 Stationarity Test

The result of the stationarity test which was conducted using the Augmented Dickey-Fuller (ADF) unit root test is presented in table 2.

Table 2: ADF Unit Root Test Result

Variable	ADF Test Statistic (At Levels)	Critical Values		Prob.	ADF Test Statistic (At First Diff.)	Critical Value		Prob.	Order of integration
		1%	5%			1%	5%		
UNPR	-2.497123	-3.600987	-2.935001	0.1235	-7.384588*	-3.605593	-2.936942	0.0002	I(1)
LOG(MSO)	-1.009331	-3.605593	-2.936942	0.7408	-4.458017*	-3.605593	-2.936942	0.0010	I(1)
LOG(MQSO)	-1.014579	-3.600987	-2.935001	0.7392	-5.414112*	-3.605593	-2.936942	0.0001	I(1)
LOG(UTSO)	1.310910	-3.600987	-2.935001	0.9983	-5.695003*	-3.605593	-2.936942	0.0000	I(1)
LOG(CONSO)	0.150076	-3.605593	-2.936942	0.9657	-3.541355**	-3.605593	-2.936942	0.0118	I(1)
LABF	5.379446	-3.610453	-2.938987	1.0000	-5.838545*	-3.605593	-2.936942	0.0000	I(1)

Source: E-view Output

Note: * and ** denote rejection of the null hypothesis of unit root at the 1% and 5% levels of significance respectively.

From the ADF unit root test result in table 2, none of the variables is stationary at levels. However, all the variables become stationary at first difference (i.e., I(1)). UNPR, MSO, MQSO, UTSO and LABF become stationary at the 1% level of significance while CONSO become stationary at the 5% level of significance.

4.1.3 Cointegration Test

Based on the result of the ADF unit root test, the cointegration test was conducted using the Johansen cointegration test. The standard test statistics used in evaluating the Johansen cointegration test result are the trace statistic and the maximum-eigen value statistic. The result of the Johansen cointegration test is presented in table

Table 3: Johansen Cointegration Test Result

Sample (Adjusted): 1984 2023
Included Observations: 40 after adjustment
Trend Assumption: Linear deterministic trend
Series: UNPR MSO MQSO UTSO CONSO LABF
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None*	0.683180	111.2682	95.75366	0.0028
At most 1	0.505708	65.29131	69.81889	0.1089
At most 2	0.347322	37.10617	47.85613	0.3425
At most 3	0.222004	20.03929	29.79707	0.4202
At most 4	0.159215	9.997947	15.49471	0.2809
At most 5	0.073675	3.061188	3.841466	0.0802
Unrestricted Cointegration Rank Test (Max-Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None*	0.683180	45.97689	40.07757	0.0097
At most 1	0.505708	28.18513	33.87687	0.2051
At most 2	0.347322	17.06688	27.58434	0.5742
At most 3	0.222004	10.04134	21.13162	0.7408
At most 4	0.159215	6.936758	14.26460	0.4966
At most 5	0.073675	3.061188	3.841466	0.0802

Source: E-view Output

Trace test indicates 1 cointegrating equation at the 0.05 level
Max-eigenvalue test indicates 1 cointegrating equation at the 0.05 level
* Denotes rejection of the null hypothesis at the 0.05 level
** MacKinnon-Haug-Michelis (1999) p-values

From the Johansen cointegration test result in table 3, both the Trace statistic and the Max-eigenvalue statistic indicated 1 cointegrating equation each. This implies that long-run (equilibrium) relationships exist among the variables of the study.

4.1.4 Estimated Long-Run Regression Result

The normalized cointegrating coefficients are shown in table 4.

Table 4: Normalized Cointegrating Coefficients

UNPR	**LOG(MSO)**	**LOG(MQSO)**	**LOG(UTSO)**	**LOG(CONSO)**	**LABF**
1.000000	0.000609	-0.001112	-0.027044	0.001413	-0.672554
	(0.00225)	(0.00125)	(0.03687)	(0.00768)	(0.36929)

Source: E-view Output

Note: The figures in the parentheses are the standard errors.

From the normalized cointegrating coefficients in table 4, the long-run coefficients in table 5 were obtained by reversing the signs of the coefficients.

Table 5: Long-Run Coefficients

UNPR	LOG(MSO)	LOG(MQSO)	LOG(UTSO)	LOG(CONSO)	LABF
1.000000	-0.000609	0.001112	0.027044	-0.001413	0.672554
	(0.00225)	(0.00125)	(0.03687)	(0.00768)	(0.36929)
	(-0.270667)	(0.88960)	(0.733496)	(-0.183594)	(1.821208)

Source: E-view Output

Note: The figures in the first and second parentheses are the standard errors and t-statistics respectively.

The estimated long-run result in table 5 showed that manufacturing sub-sector and construction sub-sector outputs have insignificant negative impact on unemployment rate while mining and quarrying sub-sector output, utility sub-sector output, and labour force have insignificant positive impact on unemployment rate.

4.1.5 VAR Lag Order Selecting Criteria

The optimal lag length selection criteria are presented in table 6. The optimal lag length is the one that minimizes the Akaike information criterion, Schwarz criterion and Hannan-Quinn criterion, and at which the model does not have serial correlation.

Table 6: VAR Lag Order Selection Creteria

Endogenous variables: UNPR LOG(MSO) LOG(MQSO) LOG(UTSO) LOG(CONSO) LABF
Exogenous variables: C
Sample: 1981 2023
Included observation: 38

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-208.2087	NA	0.003173	11.27414	11.53271	11.36614
1	9.806378	355.7089	2.25e-07	1.694401	3.504365	2.338372
2	51.88436	55.36576	1.89e-07	1.374507*	4.735869*	2.570454*
3	108.5387	56.65434*	9.70e-08	0.287437	5.200195	2.035359
4	170.3658	42.30273	6.66e-08*	-1.071882	5.392274	1.228015

Source: E-view Output

* Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

From table 6, the optimal lag length for the error correction model (ECM) is lag 2 based on the Akaike information criterion.

4.1.6 Estimated Short-Run (Error Correction Model) Result

The result of the estimated short-run or error correction model (ECM) is presented in table 7.

Table 7: Parsimonious Error Correction Model Result

Dependent Variable: D(UNPR)
Method: Least Squares
Sample (adjusted): 1985 2023
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.555981	1.466607	0.379093	0.7074
D (UNPR (-1))	0.433011	0.251345	1.722771	0.0956
D (UNPRE (-2))	0.270541	0.249920	1.082510	0.2879
DLOG (MSO (-1))	7.021165	7.055599	0.995120	0.3279
DLOG (MSO (-2))	5.659997	7.419486	0.762856	0.4517
DLOG (MQSO (-2))	-6.311029	8.852605	-0.712901	0.4816
DLOG(UTSO)	3.385107	3.183968	1.063173	0.2965
DLOG (CONSO (-1))	-4.066566	8.074321	-0.503642	0.6183
D (LABF (-1))	-0.663373	1.162836	-0.570478	0.5727
ECM (-1))	-0.447303	0.126308	-3.541355	0.0011
R-Squared	0.559641	Mean dependent var.		0.356410
Adjusted R-squared	0.498480	S.D. dependent var.		4.750390
S.E. of regression	4.064400	Akaike info criterion		5.847882
Sum squared resid.	594.6964	Schwarz criterion		6.274436
Log likelihood	-115.2534	Hannan-Quinn criter		6.000926
F-statistic	9.150301	Durbin-Watson stat.		2.062257
Prob(F-statistic)	0.000011			

Source: E-view Output

From the ECM result in table 7, the error correction term (i.e., ECM (-1)) turned up with a correct negative coefficient and it is also statistically significant at the 0.05 level of significance. The coefficient of the error correction terms is -0.447303. This implies a speed of adjustment of about 44 percent of any disequilibrium in the short-run to long-run (equilibrium) trend within a year.

4.1.7 Granger Causality Test

The result of the pairwise Granger causality test is presented in table 8.

Table 8: Granger Causality Test Result

Pairwise Granger Causality Test
Sample: 1981 2023
Lags: 2

Null Hypothesis	Obs	F-Statistic	Prob.
LOG(MSO) does not Granger Cause UNPR	41	0.26610	0.7679
UNPR does not Granger Cause LOG(MSO)		1.28007	0.2907
LOG(MQSO) does not Granger Cause UNPR	41	1.54057	0.2284
UNPR does not Granger cause LOG(MQSO)		0.669118	0.5077
LOG(UTSO) does not Granger cause UNPR	41	3.00073	0.0627
UNPR does not Granger cause LOG(UTSO)		5.06994	0.0117
LOG(CONSO) does not Granger Cause UNPR	41	2.28567	0.1167
UNPR does not Granger Cause LOG(CONSO)		0.80854	0.4537
LABF does not Granger Cause UNPR	41	3.14733	0.0553
UNPR does not Granger Cause LABF		11.3059	0.0002

Source: E-view Output

The Granger causality test result in table 8 indicated unidirectional causalities from unemployment rate to utility sub-sector output and from unemployment rate to labour force.

4.1.8 Post Estimation Tests

The classical Linear Regression Model (CLRM) is based on some implicit assumptions. These assumptions need to be satisfied for the estimated error correction model result to be valid. These assumptions include linearity (i.e., model is correctly specified); no serial correlation (i.e., estimated model is not affected by the problem of autocorrelation); homoscedasticity (i.e., the residuals have constant variance); normality (i.e., the data are normally distributed); and stability (i.e., the estimated model is stable and good for predictions). The results and decisions for these post-estimation tests are presented in table 9 and figures 1 and 2.

Table 9: Post-Estimation Tests Results

Test	Value	Prob.	Decision
Breusch-Godfrey Serial Correlation LM Test F-Statistic	 0.078223	 0.9250	Accept H0 (No serial correlation)
Breusch-Pagan-Godfrey Heteroskedasticity Test F-Statistic	 0.574294	 0.8068	Accept H0 (Model is Homoscedastic, i.e., Residuals have constant variance)
Normality (Jarque-Bera Test) F-Statistic	 1.105827	 0.575271	Accept H0 (Data normally distributed)
Linearity (Ramsey-Reset) Test t-Statistic F-Statistic	 2.853441 8.768409	 0.2158 0.2158	Accept H0 (model is correctly specified)

Source: E-view Output

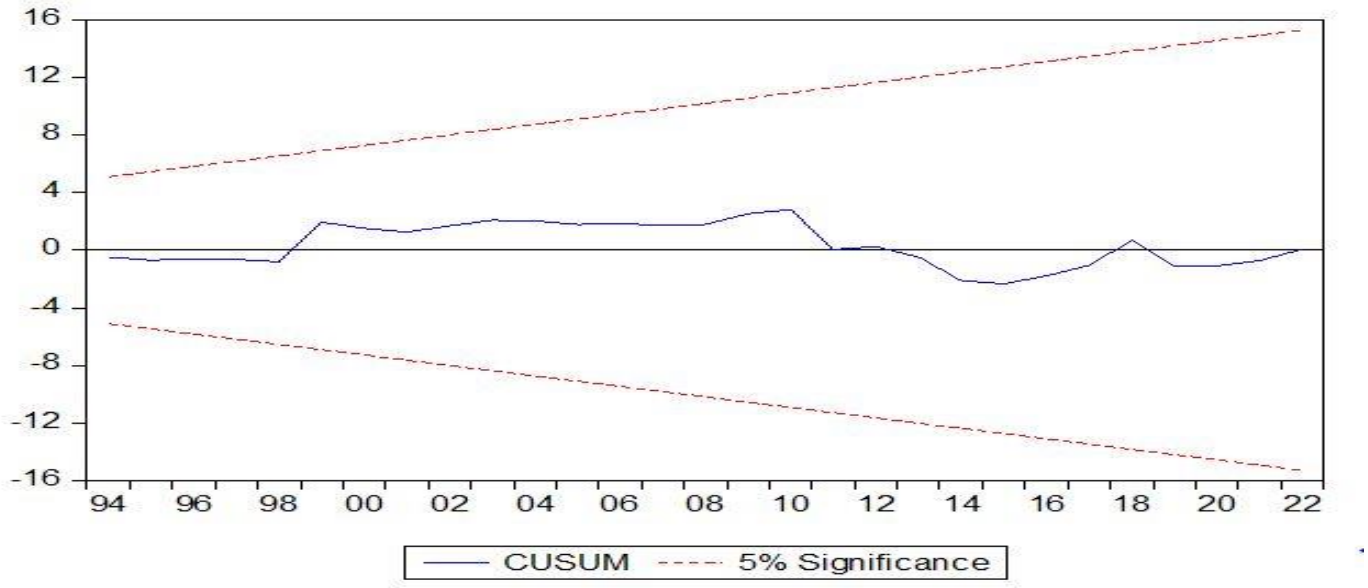

Figure 1: Cummulative Sum Test for Stability

Source: E-view Output

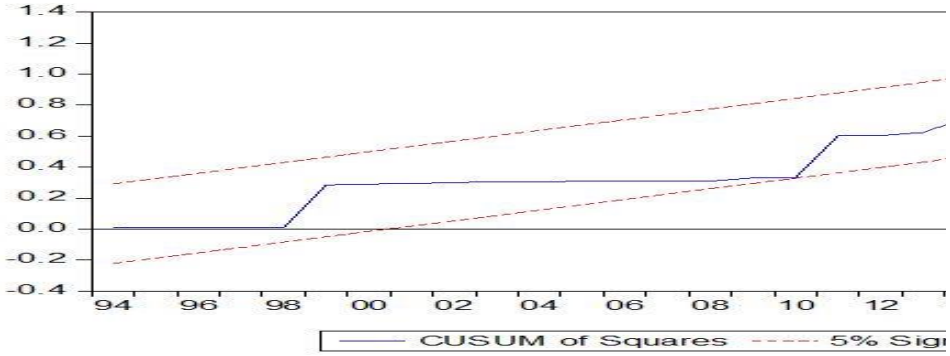

Figure 2: Cummulative Sum of Squares Test for Stability

Source: E-view Output

Note that for each of the tests in table 9, the null hypothesis (Ho) is accepted since the probability value is greater than 0.05. For the stability tests in figures 1 and 2, since the plots lie within the 5 percent critical bounds, the estimated model is considered stable.

4.2 Discussion of Findings

4.2.1 Long-Run Regression Result

i. From the estimated long-run regression result, the coefficient of manufacturing sub-sector output turned up with a correct negative sign, indicating that an increase in manufacturing sub-sector output will bring about a reduction in unemployment rate. Thus, ₦1 billion increase in manufacturing sub-sector output is associated with an average reduction of 0.000609 percent in unemployment rate. Manufacturing sub-sector output is not statistically significant at the 0.05 level of significance.

ii. The estimated long-run regression results revealed that mining and quarrying sub-sector output showed a wrong positive coefficient. This implies that an increase in mining and quarrying sub-sector output will result in an increase in unemployment. In terms of size, ₦1 billion increase in mining and quarrying sub-sector output is associated with an average increase of 0.001112 percent in unemployment rate. Mining and quarrying sub-sector output is not significant at the 0.05 level of significance.

iii. Similarly, the coefficient of utility sub-sector output displayed a wrong positive sign. The implication is that an increase in the output of the mining and quarrying sub-sector will aggravate unemployment. In terms of size, ₦1 billion increase in utility sub-sector output, is on the average, associated with 0.027044 percent increase in unemployment rate. Also, utility sub-sector output is not statistically significant at the 0.05 level of significance.

The positive impact of mining and quarrying, and utility sub-sectors on unemployment rate may be attributed to certain reasons. For the mining and quarrying sub-sector, the petroleum industry is a dominant component. It is also true that the petroleum being an economic enclave is characterized by capital-intensive and foreign investments. The implication therefore is that the foretunes of the oil industry, especially in terms of job creation, are largely detached from majority of Nigerians. As for the utility sub-sector, its poor performance may be attributed to the poor supply of electricity in the country. Thus, due to the epileptic nature of electricity supply, the utility sub-sector aggravates unemployment in the country.

iv. The estimated long-run regression result indicated that construction sub-sector output turned up with a correct negative coefficient. This implies that an increase in the output of the construction sub-sector will reduce unemployment in Nigeria. Hence, ₦1 billion increase in construction sub-sector output is associated with an

average decrease of 0.001413 percent in unemployment rate. However, construction sub-sector output is not significant at the 0.05 level of significance.

v. Labour force displayed a correct positive coefficient, indicating that an increase in the labour force will aggravate unemployment in Nigeria. In terms of size, one million persons increase in the labour force is associated with an average increase of 0.672554 percent in unemployment rate. Labour force is not statistically significant at the 0.05 level of significance. The positive impact of labour force on unemployment may be attributed to the fact that more people keep joining the labour force without a corresponding number of employment opportunities to absorb them.

4.2.2 Short-Run Regression Result

i. The estimated short-run regression result revealed that lagged values of unemployment rates in periods one and two have insignificant positive impact on the unemployment rate in the current period.
ii. Lagged values of manufacturing sub-sector output in periods one and two have insignificant positive impact on the current rate of unemployment.
iii. Past value of mining and quarrying sub-sector output in period 2 has insignificant negative impact on current rate of unemployment.
iv. Utility sub-sector output in the current period has insignificant positive impact on unemployment rate in the current period.
v. Construction sub-sector output lagged by one period has insignificant negative impact on unemployment rate in the current period.
vi. Past value of labour force in period one has insignificant negative impact on the current rate of unemployment.
vii. The estimated short-run regression result showed that the error correction term (i.e., ECM(-1)) turned up with a correct negative coefficient and it is also statistically significant at the 0.05 level of significance. The coefficient of ECM (-1) is -0.447303. This implies that any disequilibrium in the short-run is adjusted to long-run (equilibrium) trend with a speed of adjustment of about 44 percent within a year.
viii. The short-run regression result also revealed that the coefficient of multiple determination (R-squared) is 0.559641. This implies that the explanatory variables jointly account for about 55 percent of the total variations in the dependent variable. The adjusted R-squared measures the change in R-squared due to loss of degree of freedom when additional explanatory variables are introduced to the model. With an estimated adjusted R-squared of 0.508480, if additional explanatory variables are included in the ECM model, all of them (the explanatory variables) together will account for about 50 percent of the total variations in the dependent variable. The adjusted R-squared therefore measures the penalty for including irrelevant explanatory variables in the model. The estimated F-statistic is 9.150301 with a probability value of 0.000011. Since the probability value of the F-statistic is less than 0.05, the implication is that the overall estimated error correction model (ECM) is statistically significant at the 0.05 level of significance. The estimated Durbin-Watson statistic is 2.062257. This is greather than 2. It therefore implies that the estimated short-run result is not affected by the problem of autocorrelation.
ix. The pairwise Granger causality test indicated unidirectional causalities from unemployment rate to utility sub-sector output and from unemployment rate to labour force at the 0.05 level of significance.

5. Conclusion and Recommendations

5.1 Conclusion

Based on the findings, the study concludes that industrialization makes no significant contribution to job creation in Nigeria.

5.2 Recommendations

Based on the findings from the study, the following policy measures are recommended.

i. There is the need to improve the contribution of the industrial sector to job creation in Nigeria through improvement in the country's macroeconomic environment. There is also the need to provide the necessary infrastructural facilities, and improve the ease of doing business in the country. All these will help to improve the productivity and capacity utilization of the industrial sector to contribute significantly to job creation in Nigeria.

ii. The adverse effect of mining and quarrying sub-sector output on job creation may be attributed to the dominance of crude oil and natural gas output in the total mining and quarrying sub-sector output. The petroleum sector has been described as an economic enclave characterized by high capital-intensive investment which is dominated by foreign investors and a very few privileged Nigerians. Consequently, the petroleum industry employs a very insignificant percentage of the Nigerian labour force. Hence, to improve the contribution of the mining and quarrying sub-sector to job creation in the country, there is the need to increase the local content utilization of the petroleum industry. There is also the need to increase the composition of solid mineral component of the mining and quarrying sub-sector output. Hence, the development of the solid mineral sector will help to improve the job creation capacity of the mining and quarrying sub-sector.

iii. To make the utility sub-sector contribute positively to job creation in the country, there should be a significant improvement in electricity generation and supply, alongside improvement in waste management and treatment.

iv. There is the need to create an enabling environment for job creation that will match the increase in the size of the country's labour force. To achieve this, both the government and the organized private sector should embark on policies and programmes that will create jobs for the growing labour force.

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