



Pathway to Sustainable Job Creation in Nigeria: An Appraisal of Sector Performance, 1986-2020

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Abstract

This study was motivated by the ongoing debate on the role played by the agricultural, industrial and service sectors in developing economies. It examined the impact of sector performance on sustainable job creation in Nigeria. The sector performance was disaggregated into agriculture, industry and service sectors, measured by the growth rate in each of these three sectors. In addition, government expenditure was introduced to the empirical model following its link to economic development as provided in extant literature. The time series data for the variables were obtained from Central Bank of Nigeria Statistical Bulletin, National Bureau of Statistics and World Development Indicator. The data analysis techniques utilized include descriptive statistics, unit root test, bounds cointegration and Autoregressive Distributed Lag estimation and robustness tests. The unit root tests results showed that while agriculture and industrial sector growth rates were integrated of order zero, the other variables were integrated of order one. Evidence of cointegration was established in the models from the bounds test results. The ARDL results showed that agriculture sector performance had a significant (0.04) negative (-2.39) effect on unemployment. The short-term effect of industrial sector performance on unemployment was positive with t-statistic (3.3941) and probability value (0.0048). There is evidence of a significant (0.0031) negative (-0.7448) effect of service sector performance on unemployment. Government expenditure had a significant (0.0042, 0.0304) negative (-3.551, -2.582) effect on unemployment in both long and short-run. Given these findings, the study recommends that policymakers should provide incentives for industries including SMEs for improved performance of the industrial sector, while providing post-harvest facilities, lands and social community services for the agricultural and service sectors respectively. This will play a substantial role in improving the effectiveness of the industrial sector contribution while sustaining the agricultural and service sector performance to sustainable job creation in Nigeria.

Keywords: Sustainable Job Creation, Unemployment, Sector Performance, Economic Development, Nigeria.

1. Introduction

Unemployment has continued to remain a cause for concern to policy makers and development experts in developing economies. In Nigeria, unemployment rate rose from 27.1 percent in the second quarter of 2020 to 33 percent, making it the second highest on the global list (NBS, 2021). The gap between the rate of joblessness among women compared to that of men has also



continued to widen with women unemployment of 35.2 percent and that of men being 31.8 percent (NBS, *ibid*). With this intractable problem of continues joblessness among the Nigerian populace, development seems evasive. Unemployment reduction has hence been long established to be an indicator of development (Seer, 1969). This therefore has increasingly made unemployment reduction a concern for scholars, policy makers and development workers in Nigeria.

In view of the above, this study was motivated by the current debate to how sustainable job creation can be achieved in Nigeria. It focuses on appraising the performance of the agricultural, industrial and service sectors in promoting job creation in Nigeria. The link between sustainable job creation and socio-economic development has been long established as securing decent work is a known indicator for assessing the overall wellbeing and standard of living of the citizenry of any country (Jack & Tuaneh, 2022).

Existing studies have mainly focused on the contributions of specific individual sectors to employment generation in Nigeria such as the agricultural sector (Ayinde, 2008; Manggoel, Ajiji, Damar, Damiyal, Da'ar, and Zarmai, 2012; Adams, 2019), industrial sector (Ogbimi, 2007; Obadan & Odusola, 2018; Johnson & Ubong, 2020) and service sector (Aliyu, 2012). More so, a greater chunk of the literatures concentrated more on these sectors' output and economic growth proxied by real GDP (Abdul and Atteqqa, 2015; Ewubare & Obayori, 2015; Kamil, Sevin, and Festus, 2017; Oguwuike, 2018; Ibe & Obodoechi, 2019). However, little has been researched on the impact of the performance of these sectors using their growth rates on unemployment rate as proxy for sustainable job creation. This study hence seeks to bridge this research gap by examining the empirical relationship between sectoral performance and sustainable job creation in Nigeria between 1986 and 2020. The specific objectives were to examine the effects of agriculture, industrial and service sector growth as well as government expenditure on unemployment rate.



2. Literature Review

2.1 Theoretical Framework

This work is anchored on the Fisher-Clark (1940) three sector theory. The theory was first developed by Fisher (1939) and later broadened by Clark (1940) in his treatise “The Conditions of Economic Progress” that later became an established component of the economic literature. The theory described a tripartite economic structure consisting of primary, secondary and tertiary economic activities. Fisher, in trying to understand the process of economic transformation and new aspects of consumer demand that goes beyond basic agricultural and manufactured goods, came about the idea of the tertiary sector also known as service sector that deals with intangible goods and its role in economic progress and development. The theory traces the development process of the agricultural, industrial and service sectors and their role in the economic transformation process of developed and developing economies.

2.2 Empirical Literature

Ayinde (2008) examined the relationship between agricultural output and unemployment rates in Nigeria. Regression analysis and Granger Causality test were used to arrive at the finding that there exists an inverse relationship between agricultural output and unemployment in Nigeria. It therefore means that an increase in agricultural output has the tendency of reducing unemployment rate in the country. Manggoel, et al (2012) studied the problem of unemployment and agricultural sector productivity and output in Nigeria using a descriptive and content analysis method. The study concludes that agricultural productivity and output has the potential for reducing the level of unemployment in Nigeria. Adams (2019) studied the challenges of the agricultural sector output, specifically that of poultry farming and its effect on unemployment in the Federal Capital Territory. Descriptive method of analysis was adopted. The study showed that agriculture has the capacity to reduce unemployment and can bring about sustained growth and social welfare. Adegboyega (2020) examined the impact of agricultural financing on unemployment rate in Nigeria using variables like agricultural GDP, Growth rate, among others as the independent variable and unemployment as the dependent variable. The study adopted a co-integration and error correction mechanism and found that agricultural GDP among other



variables included in the model have a long run relationship with unemployment and were statistically significant in Nigeria.

On the contribution of the industrial sector to job creation, Ogbimi (2007) analyzed the relationship between industrialization and unemployment as well as poverty in Nigeria using a historical and logico-mathematical research perspectives. The study concluded that industrialization could lead to the reduction in unemployment and poverty in Nigeria. Obadan & Odusola (2018) examined the relationship between productivity and unemployment in Nigeria using granger causality approach. The findings showed a unidirectional relationship between industrial productivity and unemployment in Nigeria. More recently, Johnson and Ubong (2020) analyzed the relationship between industrial output and youth unemployment in Nigeria using the autoregressive distributed lag and granger causality technique. Their result indicated that industrial output affected youth unemployment negatively during the period under study.

With regards to service sector, Aliyu (2012) examined the sectoral output and unemployment rate in Nigeria using the Okun's Law coefficient and Generalized Method of Moments (GMM). The study showed that the service sector has great potential in reducing unemployment level in Nigeria.

3. Methodology

3.1 Research Design

The study employed ex post facto research design to explore the impact of sectoral performance on sustainable job creation in Nigeria. The motivation for this research design was based on the type of data employed, being time series data devoid of manipulation.

3.2 Model Specification

The model specification for this study followed the work of Uchechukwu and Ibiok (2015). Unemployment rate was introduced in the model to capture sustainable job creation as dependent variable, agricultural, industrial and service sector growth rates as well as government expenditure are the independent variables. The model specification is provided as follows:

Functional form of the model;



Δ = First difference operator.

n = Maximum lag length.

Π = Error correction coefficient.

ECM = Error correction term with one period lag.

f = Functional Notation

In = Natural Log Notation

3.3 Method of Data Analysis

The study adopted autoregressive distributed lag (ARDL)/Bound model of co-integration by Pesaran et al (2001), given its flexibility properties in allowing for mixed order of integration with exception of I(2). Error Correction Mechanism (ECM) was also done in order to reconcile long run disequilibrium with short run. More so, descriptive statistics was conducted as well as unit Root test by Augmented Dickey-Fuller (1981) and Phillip and Perron (1988) for stationarity was conducted to stabilize the time series data accustomed with irregularities.

4. Results and Discussion

4.1 Descriptive Statistics

The descriptive statistics for the variables are presented in table 4.1:

Table 4.1: Summary of descriptive statistics for the variables

Table 4.1 shows summary of descriptive statistics.

	UNPR	AGR	IND	SERV	GEX
Mean	12.6	5.89	1.91	5.77	3.02
Median	10.80	4.11	1.89	4.00	2.60
Maximum	29.50	55.58	18.05	19.99	9.08
Minimum	5.30	-3.19	-8.85	-0.91	0.64
Std. Dev.	6.92	8.97	5.47	4.70	1.93
Jarque-Bera	4.93	1095.15	2.67	7.52	7.78
Probability	0.08	0.00	0.26	0.02	0.02
Observations	35	35	35	35	35



Source: Author's computation from E-views software, 2020.

The descriptive statistics showed a mean value of 12.6 percent for unemployment rate. The mean values further showed that agriculture, industrial and service sectors performance and government expenditure are 5.89, 1.91, 5.77 and 3.02 percent respectively. This finding indicates that, on the average, the performance of the agriculture sector surpassed the industrial and service sectors' performance over the study period. The standard deviation showed that the observations for all the variables clustered around their respective mean values with the exception of agriculture (8.97) and industrial (5.47) sectors' performance that were higher than their mean value. Additionally, the probability values of the Jarque-Bera statistics showed that all the variables for the investigation were normally distributed at 5 percent level except agriculture and service sector performance, and government expenditure. This is because their probability values (0.00, 0.02 and 0.02 percent respectively) are lower than the conventional 5 percent level of significance.

4.2 Unit Root

Being conventional part of time series analysis, the study subjected the variables to unit root test. This test is necessary because time series variables have the tendency of trending upward and downward hence characterized by inconsistencies.

There are several kinds of unit root test such as the Dickey Fuller (1979), Augmented Dickey-Fuller (1984), Phillip Perron (1988), but the most common is the Augmented Dickey-Fuller (1984) and Phillip Perron (1988). The ADF (1984) builds on the Dickey-Fuller test and uses the null hypothesis of a unit root (otherwise, non-stationarity) in the series against the alternate hypothesis at the researchers chosen level of significance (in this case, 5 percent). The more negative or greater the calculated statistics is than the critical statistics in absolute terms, the stronger the rejection of the hypothesis that there is a unit root present in the time series.

On the other hand, Phillip Perron (1988) like the ADF test builds on the DF test and follows the testing of the null hypothesis ($\rho = 1$) of a non-stationary (I(1)) time series data. Unlike the ADF, it is more robust in the sense that it takes account of the unspecified heteroscedasticity and autocorrelation in the errors and makes corrections to the test statistics. The PP test argues that



the process of data generation for the time series (y_t) being investigated might possess more autocorrelation than is acknowledged in the DF test equation thereby invalidating it, which would warrant y_{t-1} to be endogenous. While the ADF test solved this problem by bringing in the lags of the time series as regressors under investigation into the model equation, the PP introduced a non-parametric correction to the t-statistics. Hence the adoption of these tests in particular.

Lag lengths was determined using Akaike Information Criteria (AIC) or Schwarz information criterion (SIC).

The Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) test result are presented in Table 4.2 and 4.3.

Table 4.2: ADF unit root test results

Variable	ADF statistic at levels	ADF statistic at first difference	Order of integration
UNPR	-2.605	-4.399	I(1)
AGR	-5.563	NA	I(0)
IND	-5.939	NA	I(0)
SERV	-1.463	-10.122	I(1)
GEX	-3.197	-8.866	I(1)
<i>Critical value</i>	-3.55	-3.55	

Source: Author's computation from E-views software, 2020.

Note: NA denotes not applicable given that the associated variables were stationary at levels

Table 4.3: PP unit root test results

Variable	PP statistic at levels	PP statistic at first difference	Order of integration
UNPR	-3.086	-5.388	I(1)
AGR	-5.565	NA	I(0)
IND	-5.932	NA	I(0)
SERV	-2.881	-11.183	I(1)



GEX	-2.962	-8.854	I(1)
Critical value	-3.55	-3.55	

Source: Author's computation from E-views software, 2020.

Note: NA denotes not applicable given that the associated variables are stationary at levels

The ADF unit root tests results showed that agriculture and industrial sectors' growth rates were stationary at levels given that their ADF statistics (-5.563 and -5.939) were greater than the critical value (-3.55) in absolute terms hence cointegrated at order zero [I(0)].

This finding in PP unit root test is synonymous with the ADF unit root tests results, which provided the basis for rejecting the null hypothesis of unit root for agriculture and industrial sector growth rates. Consequently, the other variables for investigation were not stationary at levels in both the ADF and PP unit root test results; they became stationary at first difference. This implies that they were integrated of order one [I(1)]. The outcomes of the ADF and PP unit root tests showed that the variables were mixed integrated [I(0), I(1)]. which prompted the test for cointegration using the bounds ARDL method.

4.3 Cointegration Test

Co-integration test was conducted in order to test for the presence of long-run relationship. It is very important to consider the possible presence of co-integration when one is choosing a technique to test the relationships between economic time series variables that have unit root.

Given the result of mixed integration in the variables, the ARDL bounds cointegration test method was conducted. The result is shown in table 4.4:

Table 4.4: Bounds cointegration test results for the unemployment model

Series: UNPR AGR IND SERV GEX		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	6.804	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound



10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author's computation from E-views software, 2020.

Note: K denotes number of explanatory variables

The result showed that the variables were cointegrated given that the computed F-statistic (6.804) is greater than the upper bound critical value (4.01) at 5 percent significance level. The evidence of cointegration among the variables provided the basis for rejecting the null hypothesis. The implication of this finding is that unemployment rate had long run relationship with the sectoral performance indicators and government expenditure in Nigeria, which corroborates with the previous findings by Adegboyega (2020) and Obadan and Odusola (2018). Hence, makes the choice of the ARDL estimation model appropriate for this study.

4.4 Long and Short Run Model

The result of the ARDL method for estimating the dynamic long and short run parameters of the explanatory variables for the model is presented in table 4.5.

Table 4.5: ARDL long and short run for the unemployment model

Dependent Variable: UNPR				
Short run results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(AGR)	-0.085259	0.035664	-2.390618	0.0412
D(AGR(-1))	-0.055570	0.122866	-0.452287	0.6585
D(IND)	-0.126049	0.115347	-1.092781	0.2943
D(IND(-1))	-0.040498	0.106667	-0.379666	0.7103
D(IND(-2))	0.369706	0.108926	3.394088	0.0048
D(SERV)	-0.213679	0.276617	-0.772472	0.4537
D(SERV(-1))	-0.744808	0.205737	-3.620195	0.0031
D(GEX)	-1.109207	0.429592	-2.582001	0.0304
CointEq(-1)	-0.332087	0.137393	-2.417056	0.0311
Long run results				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
AGR	0.959725	0.955019	1.004927	0.3333
IND	-1.666348	1.113990	-1.495838	0.1586
SERV	-0.046059	0.567242	-0.081198	0.9365



GEX	-1.042039	0.293463	-3.550836	0.0042
C	14.746473	7.252599	2.033267	0.0630
Adj R-squared	0.8382		Prob(F-statistic)	0.0000

Source: Author's computation from E-views software, 2020.

The results showed that the contemporaneous value of agriculture sector growth rate had a negative effect on unemployment in the short run. Meanwhile the first lag of agriculture growth rate was negative but not significant. The t-statistic (-2.391) of the estimated parameter is associated with low probability value (0.0412) which implies that the current year period of agriculture sector growth rate significantly affected the unemployment rate. In other words, an increase in agricultural sector performance significantly reduced unemployment hence created jobs. While the contemporaneous value of service sector growth rate was negative and not significant., the first lag is negatively linked to unemployment rate. With t-statistic (-0.7448) and corresponding probability value of 0.0031 which is less than 0.05, the negative effect of the first lag of service sector growth rate on unemployment is statistically significantly at 5 percent level. This implied that the increase in service sector performance significantly caused a reduction in unemployment rate hence job creation.

In addition, government expenditure was negatively related to unemployment rate in the long and short run. This finding was significant at 5 percent level given that the probability value (0.0042, 0.0304) of the t-statistic (-3.551, -2.582) is less than 0.05. This implies that increase in government expenditure contributed significantly in unemployment reduction during the study period. On the contrary, the short-term effect of industrial sector growth rate on unemployment is positive. The t-statistic (3.3941) with probability value (0.0048) indicates that the short-term positive effect of industrial sector growth on unemployment rate was significant at 5 percent level. This implied that an increase in industrial sector performance led to an increase in unemployment rate hence less job creation during the study period. However, the current year and one period lag of industrial sector growth was found to be negative and not significant. The significant positive effect of industrial sector growth on unemployment rate could be attributed to the capital-intensive nature of the industrial sector growth.

The long run results showed that agriculture, industrial and service sectors growth rates have no significant effect on unemployment. This finding indicates that the long-term improvement in



sectoral performance through mechanization of agriculture, growing capital-intensive nature of the industrial sector and increasing use of machinery and computers in the service sectors which reduces labour employment is associated with increase in the unemployment rate.

The error correction coefficient (-0.3321) was negative and significant at 5 percent level, which indicates that the model can adjust to long run equilibrium position at a speed of 33.21 per cent. The R-squared (0.9299) and adjusted R-square of 0.8382 showed that 83.82 percent of the total variations in unemployment were explained by changes in the explanatory variables. The highly significant probability value (0.0000) of the F-statistic indicates that the explanatory variables are jointly significant in influencing unemployment rate, which implies that the overall model is a good fit.

4.4.1 Discussion of Findings

The findings showed that agriculture sector growth had a significant negative effect on unemployment in the short run. This finding conforms to the a priori expectations which assumed that agriculture sector is an important source of employment generation. The significant negative effect of agriculture sector growth on unemployment is in accordance with the findings of Manggoel *et al.* (2012) and Adegboyega (2020) which showed that agricultural productivity and output have the potential for reducing the level of unemployment in Nigeria. The implication of this finding is the improved performance of the agriculture sector in terms of increase in the growth of crop production, livestock, fishery and forestation which creates more opportunities for employment generation and, in turn, reduces the level of unemployment in the country.

Similarly, this study established that the service sector growth had a negative and significant effect on unemployment. This finding also aligns with the theoretical expectation that the level of unemployment could be reduced through improved performance of the service sector. It equally agrees with the findings of Aliyu (2012) which showed that the service sector has great potential in reducing unemployment level in Nigeria. The implication of this finding is that improved performance of the service sector in terms of increase in transportation networks, telecommunication, real estate, education and health services play important role in reducing the level of unemployment in Nigeria.



In addition, government expenditure had a significant negative effect on unemployment rate in the long and short run. This finding is impressive as it showed that government investments in critical sectors of the Nigerian economy are essential for creating employment opportunities for the labour force.

Evidence of a significant positive effect of industrial sector growth on unemployment was established in the long run results. Although this finding is contrary to the theoretical expectations, it explains the reality in the industrial sector, where the shift from labour-intensive to capital-intensive production practices exacerbates the problem of unemployment in Nigeria. The significant positive effect of industrial sector growth on unemployment is contrary to the findings of Ogbimi (2007) and Johnson and Ubong (2020).

4.5 Diagnostic Test

The post-estimation tests focused mainly on the residual's diagnostics and model stability tests. The results are presented in Table 4.6.

Table 4.6: Post-estimation tests results

Unemployment model		
Test type	Test statistic	Prob.
Breusch-Godfrey serial correlation LM test	Chi-square (3.826)	0.1477
Breusch-Pagan-Godfrey Heteroskedasticity test	Chi-square (10.415)	0.8853
Ramsey RESET Test	F-statistic (2.839)	0.1178

Source: Author's computation from E-views software, 2020.

The results of the residual diagnostics tests (Breusch-Godfrey serial correlation LM test and Breusch-Pagan-Godfrey Heteroskedasticity test) showed that there was no evidence of serial correlation and heteroscedasticity in the model at 5 percent significance level. This is because the probability values of the Chi-square statistics for the Breusch-Godfrey serial correlation LM test and Breusch-Pagan-Godfrey Heteroskedasticity test results was greater than 0.05. Hence, the null hypotheses of no serial correlation and homoscedasticity were accepted. This finding indicates



that the residuals are serially independent and do not pose any problem in the estimated model. In addition to the residual diagnostics tests, the model stability test (Ramsey RESET Test) showed that the estimated parameters were stable at 5 percent level given that the probability value of the F-statistic is greater than 0.05. This provided the basis for accepting the null hypothesis that the model is stable hence, reliable for long term forecast and policy recommendation.

5. Conclusion

The study concludes that agricultural and service sector performance, as well as government expenditure offered opportunity for unemployment reduction hence sustainable job creation in Nigeria. On the contrary, industrial sector performance did not significantly contribute to sustainable job creation in Nigeria within the period studied.

6. Recommendation

Government should provide incentives for industries including SMEs for the improved performance of the industrial sector while providing post-harvest facilities and lands as well as social community services for the agricultural and service sectors respectively. This will play a substantial role in improving the effectiveness of the industrial sector contribution while sustaining the agricultural and service sector performance to sustainable job creation in Nigeria.

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