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An Empirical Analysis of the Effect of Industrial Growth on Unemployment in Nigeria: A Disaggregated Approach

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Abstract

The current phenomenon of 'jobless growth' being witnessed across several developing economies, Nigeria inclusive, poses far-reaching challenges to the age-old economic postulate that the growth in the gross domestic product (GDP) of an economy reduces unemployment. Many attempts have been made to verify this postulate otherwise known as Okun's Law. However, existing empirical studies of the Nigerian economy generally focused on aggregate output thereby overlooking the differential employment generating capacities of sectors in the economy. This could undermine policy making on employment as the studies did not reveal the sector(s) or even aspect(s) of the economy that is (are) more efficient in reducing unemployment. This study therefore, investigates the short-run and long-run effects of industrial sectors' growth on unemployment in Nigeria with time series data spanning 1980-2015. The econometric technique employed in the research is the Autoregressive Distributed Lag (ARDL) bound testing approach. The analysis began with pre-tests for stationarity using Augmented Dickey-Fuller (ADF) unit root tests. Four ARDL models were specified. In the first, bound testing revealed the existence of cointegration between unemployment and GDP growth. We found that growth in GDP is positively related to unemployment in the long run but a negative relationship was found in the short run. The initial disaggregation of GDP into its components i.e. agriculture, industry, construction, trade and services, in the second ARDL model, showed no long run relationship between unemployment the disaggregated GDP. In the third model, cointegration was found to exist between unemployment, agriculture, industry, services solid minerals and cement. The fourth specification also shows that there is cointegration between unemployment, manufacturing, crude oil and gas, trade and transportation. While manufacturing and services were found to be significantly and positively related to unemployment in the long run, the results on other variables were found to be mixed and insignificant. Also, the short run relationship between unemployment and all the explanatory variables were mixed but statistically insignificant. The study therefore recommend among others, the need for forging a link among the primary, secondary and tertiary sectors of the economy, with the agricultural sector linked to the industrial sectors by developing

the value chain from agricultural produce to finished industrial products. This will reduce reliance on imported raw materials and spear parts used for industrial and agricultural production and thereby increase labour participation rate and employment generating capacity of industrial and other sectorial growth in the economy.

Keywords: Industrial Growth, Unemployment, Agricultural Production, Labour, Agricultural Sector and Nigeria

Introduction

Unemployment is one of the major economic challenges that every nation tries to avoid or reduce to the barest minimum, and the problem has been of great concern to economists and policy makers in Nigeria since early 1980s. It is today one of the greatest challenges of the Sub-Saharan African economies as the high rate of unemployment has maintained a rising trend over the years (Babalola *et al.*, 2013).

In economics, there is a widely accepted view that a sustained increase in the growth rate of the Gross Domestic Product (GDP) of an economy increases employment and reduces unemployment (Akeju and Olanipekun, 2015)**.** However, the current phenomenon of 'jobless growth' being witnessed across several developing economies, Nigeria inclusive, poses far-reaching challenges to the age-old economic assumption of growth in GDP directly resulting in an increase in employment (Akeju and Olanipekun, 2015)**.** In an attempt to tackle the menace of unemployment which is one of the major indicators for measuring the performance of any economy, Arthur M. Okun in the early 1960s statistically established the relationship between change in unemployment rate and economic growth. The empirical finding of Okun's work indicates 3:1 relationship between gross national product (GNP) and the unemployment rate (Babalola *et al.,* 2013; and Akeju and Olanipekun, 2015)**.**

Specifically, Okun's law postulates a bi-directional relationship between output and unemployment rate. Intuitively, more labour is required to produce more output and as employment of labour increases during recovery stage of business cycle, personal income increases which in turn increases the aggregate demand and hence national output. However, during the recessionary stage of business cycle, workers lose their jobs i.e., unemployment rate increases as output decreases (Babalola *et al.*, 2013).

The theoretical proposition relating output and unemployment as proposed by Okun (1962) is among the most famous in macroeconomics theory (Akeju and Olanipekun, 2015). The theory has been found to hold for several countries and regions mainly, in developed countries (Christopoulos, 2004; Daniels and Ejara, 2009). However, recent evidences particularly since the World Summit for Social Development held in Capenhagen in 1995 have shown that employment has not grown proportionally with the gross domestic product (GDP) growth in developing countries (Jose-Nghessan, 2006). Also, empirical findings in Nigeria have revealed that Okun's law does not hold in the economy (Babalola *et al.,* 2013, Arewa and Nwakanma, 2012; Akeju and Olanipekun, 2015). This implies that the prescription of orthodox economics that to reduce unemployment, policies should be designed to increase the GDP does not hold in all economies. Hence the renewed debate on appropriate policies that could be designed to solve the problem of unemployment in Nigeria and other developing countries.

It is pertinent however to note that most of the empirical studies made to verify the Okun's law in Nigeria (among which are; Njoku and Ihugba, 2011; Babalola, *et al.* 2013; Adudu and Ojonye, 2015; and Florence *et al.* 2015) generally focused attention on aggregate output thereby overlooking

differential employment elasticity of sectors in the economy. This could undermine policy making on employment as the studies did not reveal the sector(s) or even aspect(s) of the economy that is (are) more efficient in reducing unemployment. Only Ajakaiye *et al.* (2016) to the best of our knowledge examined a disaggregated effect of growth on employment and their study was focused on manufacturing, services and agricultural sectors. Also Ajakaiye *et al.* (2016) used time series variables and neither conducted unit root tests on the variables nor examined both the short-run and long-run effects of sectoral growth on employment. Therefore, the objective of this study is to investigate the short-run and long-run effects of industrial sectors' growth on unemployment in Nigeria with time series data spanning 1980-2015. Thus the study will conduct unit roots test on the variables. Also industrial growth is to be examined in its aggregate and disaggregated components to include manufacturing and mining (i.e. oil and gas, and solid minerals), to investigate their respective impacts on unemployment. The employment generating effects of the services and agricultural sectors will also be examined.

Generally, the theoretical expectation is that a negative relationship exists between output-growth and unemployment. Thus increased output growth in any sector is expected to have negative effect on unemployment. However, according to Ajakaiye *et al.* (2016), the main reason for 'jobless growth' in Nigeria is because the Nigerian economy is transforming from an agrarian economy to a service economy without going through the intermediate stage of industrialization. This implies that the employment elasticity of growth may vary from sector to sector which has implications for sector specific policies to harness the full employment generation potentials of the economy.

Therefore, this paper empirically examines the effect of industrial growth on unemployment in Nigeria and whether Okun's law holds in the economy based on data from 1980-2015. To achieve this, the paper is divided into five sections which includes introduction, literature review, research methodology, presentation of results and interpretation, and finally summary and conclusion.

Conceptual Issues

Two key concepts are used in this study. These are industrial growth and unemployment. The concepts are defined as follows:

The Concept of Industrial Growth

Industrial growth is a complex phenomenon. It connotes growth in the value of output produced by the factors of production that are applied in the industrial sector of a given economy. Often attention is concentrated on labour productivity, that is, the value of output produced by the labour input which can be measured by the number of workers, or by the number of hours of work to produce that output. However, a Total Factor Productivity (TFP) tries to capture the value of all inputs (labour, capital, intermediate materials) (Janakar, 2013).

The level of output growth in a single firm or corporation depends on the capital employed, the labour employed, and the level of technology used in production as these could be heterogeneous. Aggregate output growth may also depend on some "unobservables" such as infrastructural facilities, level of trust in society, property rights, the legal and administrative structures, political conditions, and the economic framework. Furthermore, aggregate output growth depends on the productivity of and linkage among the different sectors, including agriculture, manufacturing, and the service sectors. In general, agricultural output growth increases slowly, while that of manufacturing tends to grow faster because of technological change, specialisation, learning-by-doing, economies of agglomeration, and static and dynamic economies of scale. Hence, the larger the share of the manufacturing sector the greater the likelihood of a faster growth in productivity as labour moves from a relatively low productivity sector (agriculture) to a higher productivity sector (manufacturing). Aggregate output growth are driven by an

increase in gross investment that embodies new technology, as well as general technological change that comes about with increased knowledge, innovation, and Research and Development. Aggregate productivity changes may be affected by the economic and social climate, investment, innovations, and entrepreneurial confidence in the economy. This may depend on the political climate and natural disasters like wars, floods, droughts, etc. which may have long lasting effects on the level and rate of change of productivity (Janakar, 2013). On the whole, this paper sees aggregate output growth as the same as the sustained growth of total output or GDP over time which is generally termed as economic growth.

The Concept of Unemployment

The unemployment rate in Nigeria has been very high over the years. The indicator measures the proportion of active population that is without and actively seeking work **(**Ajakaiye *et al***.**, 2016).

The total labour force in the country is made up of persons between the ages of 15–64 years excluding students, retired persons, stay-at-home parents, home-keepers, and persons unable to work or not interested in work (Kale and Doguwa 2015). Unemployment rate on the other hand, is the proportion of the labour force that was available for work but cannot find work. The labour market and employment situation reveals that there was an average increase of 2.8 per cent in the population growth between 2010 and 2014. Nigeria's population rose from 138.6 million in 2005 to 159.7 million in 2010 and 178.5 million in 2014. In the same vein, the labour force, made up of the total number of employed and unemployed persons within the ages of 15-64 years, increased by 2.9 per cent on average, from 65.2 million in 2010 to 72.9 million in 2014. However, the total labour force in full remunerative employment increased at an average of 2 per cent over the period compared to 6.1 percent and 16.48 percent for the underemployed and unemployed population respectively **(**Ajakaiye *et al***.,** 2016).

On the other hand, employment is examined from the concept of a good job which could be defined from the perspectives of an individual and the society. From an individual's perspective, a good job is a well-paid secured job. From a societal point of view a good job is one that maximises societal welfare. This simply reinforces the argument that in most countries the wages paid do not reflect the marginal social benefits. "Good jobs for development are those that make the greatest contribution to society, taking into account the value they have to people who hold them and also their potential spillovers on others" (World Bank, World Development Review, 2013, p. 154.). Also, those that are employed are the people who are within the age of 15-64 years that have good jobs.

Theoretical Framework

The economic theory that can be used in explaining the relationship between output growth and employment is Okun's law which is an empirical observation of the relationship between unemployment rate and economic growth. Though the inverse relationship between the unemployment rate and the growth of real output had been accepted by economists for many years, Arthur Okun (1962) was first to formalise the relationship into a statistical one when he measured the extent to which the unemployment rate is negatively related to real output growth. He postulated that a 1% increase in the growth rate above the trend rate of growth would lead only to 0.3% reduction in unemployment. This implies that a 1% increase in unemployment will mean roughly more than 3% loss in GDP growth. Hence the rate of GDP growth must be equal to its potential growth just to keep the unemployment rate constant. To reduce unemployment, therefore, the rate of GDP growth must be above the growth rate of potential output (Akeju and Olanipekun, 2015; Jose, 2006).

Okun however, pointed out that changes in the unemployment rate per se cannot account for the changes in real output as the unemployment rate changes, but that there are intermediary factors, such as labour

force participation and productivity linking unemployment rate and the real output in the specified relationship (Akeju and Olanipekun, 2015). This study is therefore based on the theoretical underpinning of the Okun's law.

Review of Empirical Studies

Several authors have estimated the relationship between employment and economic growth for a variety of nations. An International Labour Organization Report (1996) concluded that the positive responsiveness of employment growth to GDP growth has generally not declined in industrialized countries as a whole. However, a country-by-country analysis revealed mixed results, while those focusing on the Nigerian economy are largely based on aggregate GDP, and their findings indicated that productivity and employment relationship negates Okun's law as stated earlier. Some of these empirical studies existing in the literature both within and outside the Nigerian economy are examined below beginning with those conducted outside the country.

Seyfried (2005) examined the relationship between economic growth, as measured by both real GDP and the output gap, and employment in ten largest states of US from 1990 to 2003. Models were developed in the study to estimate the employment intensity of economic growth as well as the timing of the relationship between employment and economic growth. The results indicate that economic growth has some immediate positive impact on employment, and its effects continue for several quarters in most of the states considered.

Ahsan et al. (2010) in their study the aggregate growth profile in India, found that higher employment is not usually associated with higher per capita GDP. The study was on poverty rates, employment, and the working-age population using data which cover the periods 1983–1993 and 1993–2003.

In another research, Geidenhuys and Marinkov (2007) tried to give answer to the question of how unemployment responds to changes in output in South Africa. For this reason, they estimated the relationship between economic activity and unemployment rate. The results indicated the presence of an Okun's law relationship in South Africa over the period 1970 -2005.

Villaverde and Maza (2008) analyzed Okun's law for Spanish regions using data for the period 1980-2004. The results verified the existence of Okun's law for most of the regions and for the economy as a whole.

Among the studies carried out in Nigeria is that of Adudu and Ojonye (2015). They investigated the impact that economic growth in Nigeria had on employment generation. The Johansen vector- error correction model was used in the investigation. The findings revealed that, although economic growth had positive relationship with employment, the relationship is not significant. Foreign private investment has negative impact while public expenditure has positive and significant impact on employment. It is concluded that the growth in Nigeria does not support employment.

In their study**,** Ajakaiye *et al.* (2016) examined the relationship between growth and employment in Nigeria to gain insights into the country's paradox of high economic growth alongside rising poverty and inequality. The methodology adopted is the Shapley decomposition approach, complemented with econometric estimation of the country's employment intensity of growth using OLS technique. The findings indicate that Nigeria's growth over the last decade has been 'jobless' and sustained largely by factor reallocations rather than productivity enhancement. Labour reallocations have been mainly from agriculture and manufacturing towards the low employment generation services sector. The study further revealed that the employment elasticity of growth was positive and quite low, reflecting the country's poor overall employment generation record, especially in manufacturing.

Babalola *et al.* 2013) empirically tested the validity of Okun's law in the Nigerian economy from 1980-2012. The two versions of the model approach of the Okun's law were used even though one of them

is frequently used in the literature. The research utilized Var-cointegration method and examined the direction of causality using the Var Granger causality/Block Exogeneity Wald test. It was found that Okun's law does not hold in the Nigerian economy.

Arewa and Nwakanma (2012) conducted an empirical evaluation of the relationship between output and unemployment using the first difference and output-gap models of Okun's law. The study found no evidence to support the validity of Okun's law in Nigeria.

In their examination of the relationship between unemployment rate and economic growth, Aketu and Olanipekun (2015) employed Error Correction Model (ECM) and Johasen cointegration test to determine both the short run and long run relationships among the variables employed in the study. The Empirical findings showed that there is both the short and the long run relationship between unemployment rate and output growth in Nigeria. The paper found out that Okun's law is not valid in Nigeria.

In another study by Njoku and Ihugba (2011) the relationship between unemployment and growth in Nigeria between 1985 and 2009 was investigated. One major findings of the study is that the economy grew by 55.5 percent between 1991 and 2006; and the population increased by 36.4 percent. This should have resulted in a decrease in the rate of unemployment but rather, unemployment increased by 74.8 percent. The study also found out that the average contribution of the oil sector to the GDP between 1991 and 2006 is 30.5 percent while agriculture that is the main source of gainful employment in the country contributed 36.7 percent just a difference of 6.1 percent from that of oil that employs less than 10 percent of the labour force.

Florence *et al.* (2015), within the framework of labour productivity theory, examined the interface between youth unemployment and labour productivity as they relate to growth of Nigerian economy. The paper employed both qualitative and quantitative research methods to examine the incidence of youth unemployment as a function of labour productivity. It revealed that there is positive relationship between youth unemployment and labour productivity in Nigeria.

From the foregoing review of empirical studies conducted in Nigeria, it is observed that the authors generally focused attention on aggregate output thereby overlooking differential employment elasticity of sectors in the economy. Only Ajakaiye *et al.* (2016) examined a disaggregated effect of growth on unemployment focusing on manufacturing, services and agricultural sectors. In view of this, this study empirically investigated the effect of industrial growth on unemployment using a disaggregated technique in order to reveal the sector(s) or aspect(s) of industrialization that is (are) more efficient in reducing unemployment.

Trend of Unemployment and Growth of GDP in Nigeria

In general, employment creation has remained elusive for the Nigerian economy. The unemployment figure has been growing over the years. The trend of unemployment in Nigeria has shown that its rate is still high as in the 1980s. According to the National Bureau of Statistics, unemployment rate declined in response to the various measures put in place to 5.3 percent in 1981 from the height of 6.4 percent in 1980. It stood at 3.4 percent in 1996 and slightly decreased to 3.2 percent in 1997 and 1998 but peaked at 6.4 percent in 2005. However, unemployment in the first quarter of 2006 was 13.6 percent while the corresponding rate in 2007 was 14.6 percent. This figure increased to 19.7 percent in 2009, 21.1 percent in 2010 and 23.9 percent in 2011 respectively (Akeju and Olanipekun, 2015; Oloni, 2013). In 2014, it increased further to 25.1 per cent from 24.7 per cent in 2013 (World Bank, World Development Review 2013; Ajakaiye *et al*., 2016). Since 2000, the rate of unemployment has grown at a compound annual average of 4.8 per cent, even as it has continued to fluctuate and intensify (Ajakaiye *et al*., 2016).

According to Akeju and Olanipekun (2015), the rate is higher in the rural areas (25.6 percent) than in the urban areas (17.1 percent).

On the other hand, Nigeria's GDP grew from 3.1 per cent in the 1990s to more than an average of 5 per cent beginning in 2000, largely driven by the value addition from the service sector. The major service subsectors include retail and wholesale, real estate, information, and communication (Barungi et al. 2015).

The real Gross Domestic Product (GDP), measured in 1990 basic prices grew by 7.9 percent in 2010, compared with 7.0 percent in 2009. Growth in 2010 was attributed largely to the performance of the non-oil sector output which grew by 8.5 percent complimented by a significant increase in oil sector output. The performance of the Nigerian economy was mixed in 2011. Real GDP growth slowed to 7.4% in 2011 from 7.9% in 2010, driven predominantly by crop production, wholesale and retail trade and telecommunications sectors, which accounted for 28.0%, 28.8% and 21.4% of real GDP growth respectively during the year (Akeju, and Olanipekun, 2015).

Nigeria has maintained remarkable growth over the last decade, recording an average growth rate of 6.8 per cent. Real gross domestic product (GDP) growth was estimated at 6.23 per cent in 2014 compared to 5.49 per cent in 2013. The rebasing of Nigeria's GDP in April 2014 by the National Bureau of Statistics to better reflect the size and structure of the economy, saw it surge past South Africa to become Africa's largest economy with a rebased GDP estimate of USD454 billion in 2012 and USD510 billion in 2013. The rebased GDP, using updated prices and improved methodology, also reveals an economy that appears to be more diversified, with rising contributions of previously undocumented services (including the entertainment industry) to GDP. This also indicated that the Nigerian economy is transforming from an agrarian economy to a tertiary service economy, without going through the intermediate stage of industrialization (Ajakaiye *et al*., 2016).

This 'tertiarization' of the economy has so far failed to deliver quality jobs hence recent growth has not translated into significant social and human development contrary to the postulates in the development literature that associate faster economic growth with poverty reduction. The 2010 Nigeria Poverty Profile Report by the Nigeria's National Bureau of Statistics (NBS 2010a) estimated the poverty incidence at 69 per cent in 2010, up from 54.4 per cent in 2004, using the Harmonized National Living Standard Survey (HNLSS) of 2009/10. The country's performance is at odds with the general international trend of poverty reduction, in particular in other countries experiencing rapid economic growth (Ajakaiye *et al*. 2014).

Rising rural unemployment is also evolving as opportunities are shifting away from agriculture, despite the high prevalence of subsistence farming. There is stagnation in production and low productivity in the sector, where more than half of the rural population work, and the high growth witnessed in the services sector, are key reasons for the large variations across urban and rural labour groups. The unemployment rate is much higher in the northern part of the country where two-thirds of the population engage in subsistence agriculture, and relatively lower in the southern part where more than half of the population engages in self-employment/wage work (World Bank 2015).

Data from the NBS also reveals that there is a higher incidence of unemployment for women than men; and in recent times, their access to quality job opportunities declined even further—while the number of unemployed males has hovered around 7–8 million in the past 5 years, the number of the unemployed female population increased from 6.7 million in 2010 to over 10 million in 2014 (NBS, 2015).

Youth unemployment on the other hand is intensifying. Large concentrations of youths, trained and untrained, educated and uneducated, are idle and without any hope of securing a decent job. Youth unemployment was recorded as 45.8 per cent in 2014. Also, unemployment is generally high regardless of level of education. For example, as at 2014, unemployment rates among persons who never attended

school, and those with secondary and post-secondary education hover around 25 per cent while the unemployment rate among persons with primary education or below is somewhat lower at 15.1 per cent and 17.1 per cent respectively. Among those who have secondary and post-secondary education, skills gaps and job search barriers are major barriers to gainful employment (Ajakaiye *et al*., 2016).

Despite the high economic growth witnessed in the last one and a half decades, the country has not yet been able to transform into an innovation-based high-skill (knowledge) economy. Hence, its trade composition and pattern which are based on exports of primary products and imports of finished or semi-finished products contribute very little in the global value chain (Ajakaiye *et al*., 2016).

Research Methods

The method employed in carrying out the study is presented as follows:

Data

This research, in view of its nature made use of secondary data. Annual data employed were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and National Bureau of Statistics (NBS) financial and external sector statistics for the period 1980-2015. The 36-year period is selected to meet the requirement of the Central Limit Theorem that sample size must not be less than thirty years for normality purpose, and the fact that the larger the sample, the greater the reliability or validity of time series research findings (Gujarati, 2005).

Variables

Unemployment rate is used as the dependent variable as it best reveals the labour force engagement; the data on it are easily accessible, and it is also considered appropriate in view of the theoretical underpinning of the study.

The independent variables are the GDP, agricultural output, industrial output, services sector, manufacturing output, crude oil and gas, trade, transportation, solid minerals, construction and cement industry.

Model Specification

The econometric models used for the study is adapted from Ajakaiye *et al.* (2016) and are specified as follows:

$$UNEMP_t = \beta_o + \beta_1 InGDP_t + U_t \quad \text{.....(1)}$$

$$UNEMP_t = \beta_o + \beta_1 InAGR_t + \beta_2 InIND_t + \beta_3 InCONS_t + \beta_4 InTRADE_t + \beta_5 InSERVS_t + U_t \quad \text{.....(2)}$$

$$UNEMP_t = \beta_o + \beta_1 InAGR_t + \beta_2 InIND_t + \beta_3 InSERVS_t + \beta_4 InSOLD_t + \beta_5 InCEMT_t + U_t \quad \text{.....(3)}$$

$$UNEMP_t = \beta_o + \beta_1 InMAN_t + \beta_2 InCRUG_t + \beta_3 InTRADE_t + \beta_4 InTRANS_t + U_t \quad \text{.....(4)}$$

Where UNEMP = Unemployment rate

β_o = Constant parameter

β_i = Coefficients of the explanatory variables

$lnGDP_t$ = log of gross domestic product

$lnAGR_t$ = log of agricultural output

$lnIND_t$ = log of industrial output

lnCONSt = log on Construction output

$lnSERVS_t$ = log of services sector's output

$lnSOLD_t$ = log of solid mineral sector's output

$lnCEMT_t$ = log of cement industry's output
$lnMAN_t$ = log of manufacturing output
$lnCRUG_t$ = log of crude oil and gas sector's output
$lnTRADE_t$ = log of trade
$lnTRANS_t$ = log of transportation
U_t = Stochastic disturbance term
t = Time Subscript

Equation 1, 2, 3 and 4 were employed as models for this research.

Method of Data Analysis

The data collected for this research were analysed using Autoregressive Distributed Lag (ARDL) model along with error correction model. The ARDL model is an innovation in time series econometrics developed by Pesaran and Shin (1996); Pesaran and Pesaran (2001); for testing the existence of co-integration. One of the advantages of using the ARDL approach to testing for the existence of a long-run relationship between variables is that it is applicable irrespective of whether the underlying variables are purely I(0) or I(1), or a mixture of both (Khosravi and Karimi, 2010). However, in the presence of I(2) variables, the computed F-statistics provided by Pesaran *et al.*(2001) will become invalid.

Therefore, the use of unit root tests in the ARDL approach is inevitable to ensure that none of the variable is integrated of order I(2) or beyond. To detect the presence or otherwise of unit root, we consider a variable that has a unit root represented by a first order autoregressive AR (1) as follows:

$Y_t = \beta Y_{t-1} - U_t$. .....(4)

Where Y_t is the level variable, Y_{t-1} is the first lag of the dependent variable (Y_t), β is the parameter and U_t is the white noise error term assumed to be normally distributed with zero mean and constant variance and also assumed to be serially uncorrelated. If the absolute value of the coefficient β is less than 1 (i.e. $|\beta|<1$), then Y_t is stationary. If, on the other hand, the absolute values of the coefficient β is statistically equal to or greater than 1 (i.e $|\beta|\geq 1$) then Y_t is non stationary and unit root exists (Gujarati, 2005). To identify stationarity or non-stationarity of the variables used in this research, we adopted the conventional Augmented Dickey – Fuller (ADF) unit root test based on the model expressed below:

$\triangle Y_t = \beta_0 + \beta_1 Y_{t-1} + \alpha_i \sum Y_{t-i} \triangle + u_t$.....(5)

Where: $\triangle Y_t$ = Differenced value of a given time series variable
β_0 = Constant Parameter
β_1 = Coefficient of the first lag value of the series variable
Y_{t-1} = First lag value of a series variable
α_i = Coefficient of the lag values of the differenced time series variable
$\triangle Y_{t-i}$ = Lag values of the differenced series variable
u_t = Error term.

The four Autoregressive Distributed Lag (ARDL) models used in this study are expressed as follows:

ARDL I

$\triangle InUNEMP = \delta_0 + \delta_1 InUNEMP_{t-1} + \delta_2 InGDP_{t-1} + \sum \lambda_1 \Delta InUNEMP_{t-i} + \sum \lambda_2 \Delta InGDP_{t-i} + \lambda_3 ECM_{t-1} + u_t$.....(6)

ARDL II

$\triangle InUNEMP = \delta_0 + \delta_1 InUNEMP_{t-1} + \delta_2 InAGR_{t-1} + \delta_3 InIND_{t-1} + \delta_4 InCONS_{t-1} + \delta_5 InTRADE_{t-1} + \delta_6 InSERVS_{t-1} + \sum\lambda_1 \Delta InUNEMP_{t-i} + \sum \lambda_2 \Delta InAGR_{t-i} + \sum \lambda_3 \Delta InIND_{t-i} + \sum \lambda_4 \Delta InCONS_{t-i} + \sum \lambda_5 \Delta InTRADE_{t-I} + \sum\lambda_6 \Delta InSERVS_{t-i} + \lambda_7 ECM_{t-1} + u_t$.....(7)

ARDL III

$\triangle InUNEMP = \delta_0 + \delta_1 InUNEMP_{t-1} + \delta_2 InAGR_{t-1} + \delta_3 InIND_{t-1} + \delta_4 InSERVS_{t-1} + \delta_5 InSOLD_{t-1} + \delta_6 InCEMT_{t-1} + \sum\lambda_1 \Delta InUNEMP_{t-i} + \sum \lambda_2 \Delta InAGR_{t-i} + \sum \lambda_3 \Delta InIND_{t-i} + \sum \lambda_4 \Delta InSERVS_{t-i} + \sum \lambda_5 \Delta InSOLD_{t-I} + \sum\lambda_6 \Delta InCEMT_{t-i} + \lambda_7 ECM_{t-1} + u_t$.....(8)

ARDL IV

$\triangle InUNEMP = \delta_0 + \delta_1 InUNEMP_{t-1} + \delta_2 InMAN_{t-1} + \delta_3 InCRUG_{t-1} + \delta_4 InTRADE_{t-1} + \delta_5 InTRANS_{t-1} + \sum\lambda_1 \Delta InUNEMP_{t-i} + \sum \lambda_2 \Delta InMAN_{t-i} + \sum \lambda_3 \Delta InCRUG_{t-i} + \sum \lambda_4 \Delta InTRADE_{t-i} + \sum \lambda_5 \Delta InTRANS_{t-I} + \lambda_6 ECM_{t-1} + u_t$.....(9)

Where δ_0 = Constant Parameter

Δ = First difference operator

δ_i, λ_i = Vector of the parameter of the lagged values of the natural logarithmic values of the explanatory variables.

ECM_{t-1} = Error correction term

u_t = Error term

The terms with the summation signs ($\sum$) in the equations above represent the error correction dynamics while the second part of the equation with δ_i correspond to the long-run relationship. The null hypothesis in the four ARDL equations is $H_0 = a_1 = a_2 = a_3 = 0$. This denotes the absence of long-run relationship while the alternative hypothesis is H_1: $a_1 \neq a_2 \neq a_3 = 0$. The calculated F-statistic is compared with two sets of critical values. One set assumes that all the variables are I(0) and the other assumes they are I(1). If the calculated F – statistic exceed the lower and upper critical value, the null hypothesis of no co-integration will be rejected irrespective of whether the variables are I(0) or I(1). If it is below the upper value bound, there is no cointegration.

Once a co-integration relationship has been ascertained the long-run and short run parameters of the relationship are then estimated.

Presentation of Results and Interpretation

The findings of the study are presented as follows.

Unit Root Test Results

Table 1: Unit Root Tests Results

	ADF Unit Root Test			
Variables	**Critical Values**	**At level I(0)**	**Critical Values**	**At First Difference I(1)**
UNEMP			-4.309824	-6.63094***
InGDP			-4.252879	-8.566993***
InAGR			-4.252879	-4.447399***
InIND			-4.252879	-5.681937***
InSERVS	-3.207094	-3.347718*		
InCONS	-4.252879	-6.074624***		

InSOLD			-4.252879	-13.396***
InCEMT	-4.262735	-4.642258***		
InMAN	-4.243644	-5.557502***		
InCRUG			-4.252879	-5.914952***
InTRADE			-3.548490	-3.701722**
InTRANS			-4.252879	-8.672613***
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**				
*** Statistical significance at 10%**				
Source: Eviews 9				

As a precondition for applying the ARDL bound testing approach to cointegration, the need to ensure that none of the variables is beyond being integrated of the first order i.e. I(1) requires unit root tests of each of the variables in the model. The outcome of the unit root tests using the Augmented Dickey Fuller (ADF) test reveal that all the variables satisfy this condition. The results are presented in the Table 1.

As a first step in the analysis, the explanatory variables were transformed into natural logarithm form. Tests for unit roots in the variables at both level and first difference values were conducted using the augmented Dickey-Fuller (ADF) test.

Table 1 shows that services, manufacturing, construction, and cement industries' output were stationary at level I(0) while unemployment, gross domestic product (GDP), and the outputs of agriculture, industry, crude petroleum and natural gas, trade, transportation, and solid minerals, were stationary after first difference. Therefore, it was found that the null hypotheses of a unit root at level and first difference values were rejected in the ADF test. This is because in absolute term, the t-test statistic values of the variables examined were found to be statistically significantly greater than their critical values. While the test statistic values of services sector output and trade were significant at 10% and 5% respectively, the test statistic values of other variables were significant at 1% as indicated above. This implies that none of the series is I(2) and can all be included in the ARDL estimation.

Regression Results

The ARDL estimation was done using four different models specified above. It begins by examining the relationship between unemployment and GDP (i.e. ARDL I), followed by the relationship between unemployment, agriculture, industry, construction, trade, and services (ARDL II); the relationship between unemployment, agriculture, industry, services, solid minerals, and cement industries (ARDL III); and lastly, the estimation procedure on the relationship between unemployment, manufacturing, crude petroleum, trade, and transportation industry was conducted (ARDL IV). The four different models were used to avoid much reduction in the degree of freedom by inclusion of more explanatory variables in view of the relatively small number of observations examined (thirty six) due to data availability problem on unemployment before 80s. Also, maximum of two lag lengths were considered to reduce the problem of degree of freedom in the time series analysis.

In each of the ARDL procedure examined, the optimum lag length selection criteria was carried out in order to determine the number of lag(s) to be included in the ARDL models prior to the bound test. The results are presented in Table 2, Table 6, Table 8, and Table 12.

Table 2: Lag Length Selection for ARDL I Model

Lag	AIC	SC	HQ
0	5.962659	6.054267	5.993024
1	5.043673	5.279414	4.984641
2	4.882824	5.215875	4.984641

Source: Eviews 9

From Table 2, the Akaike Information Criterion (AIC), and Shwarz Criterion (SC) indicate that two maximum lags are to be included in the ARDL I model. The results of the ARDL bounds testing approach are shown in Table 3.

Table 3: ARDL Bounds Test for Cointegration (ARDL I Model)

Dependent Variable: ΔUNEMP

Function		**F-Statistics**
F(UNEMP/InGDP		8.454559***
Critical Value	Lower Bound	Upper Bound
1%	3.17	4.14
5%	3.79	4.85
10%	5.15	6.36

Note: *** Statistical significance at 1% level; ** statistical significance at 5%;

* Statistical significance at 10%.

Critical values are obtained from Pesaran et al. (2001).

Source: Eviews 9

Having conducted the unit root test and the optimum lag selection, F-statistic test for cointegration is required to determine whether there is cointegration among the variables captured in the unrestricted error correction version of the ARDL model. This has been estimated using the bound testing approach and the results presented in Table 3 above.

From Table 3, the bound test results reveal the existence of a long run relationship between unemployment and GDP. In the function F(UNEMP/lnGDP), the null hypothesis that there is no cointegration is rejected at both 1% as the F-statistic, 8.454559 is greater than the critical value, 4.14, at the upper bound indicating that there is cointegration between unemployment and GDP. Next step is to examine the long run impacts of GDP growth on unemployment in Nigeria using OLS technique.

Table 4: Estimated Long Run Coefficients of ARDL I Model

Dependent Variable: UNEMP		
Independent Variables	Coefficients	P-values
C	-16.68093***	0.0000
InGDP	3.281959***	0.0000
R2 = 0.695924 F-Statistic = 68.65963 (0.000000)		
Durbin-Watson Statistic = 0.493290		
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**		
*** Statistical significance at 10%**		
Source: Eviews 9		

We estimate the long run equilibrium relationship between the variables using OLS. From the results as reported in Table 4, it reveals that GDP growth is positively related to unemployment in Nigeria in the long-run, and the result is statistically significant at 1%. This negates the postulation of the Okun's law which states that there is negative relationship between economic growth and unemployment. The coefficient of determination (R^2) is 0.695924. The result shows that 70% of variation in unemployment rate is caused by variation in the explanatory variable. The Durbin Watson statistics is 0.493290 which shows the absence of serial correlation. The F-statistic (68.65963) is significant at 1% which means that the model is adequate.

Table 5: Results of Estimated Short Run Coefficients of the Selected ARDL I Model
Dependent Variable: ΔUNEMP

Independent Variables	Coefficients	P-values
C	6.375586***	0.0006
ΔInUNEMP(-1)	-0.146975	0.3981
ΔInUNEMP(-2)	0.001895	0.9908
ΔInGDP(-1)	-10.19356*	0.0758
ΔInGDP(-2)	-17.38017***	0.0081
ECT(-1)	-0.567536***	0.0005
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**		
*** Statistical significance at 10%**		

Source: Eviews 9

The results of the short run relationship is estimated and reported in Table 5. The error correction coefficient (ECT(-1)) which is approximately -0.57 not only has the expected negative sign but it is also statistically significant at 1% considering the probability value which is 0.0005. The value of the ECT(-1) implies a fairly high speed of adjustment to equilibrium after a shock. Approximately 57% of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year. For the explanatory variable, the differenced one period and two period lag values of GDP show the existence of significant negative relationship between economic growth and unemployment at 10% and 1% levels respectively. This means that economic growth and unemployment relationship in the short run follows the Okun's law in Nigeria.

Table 6: Lag Length Selection for ARDL II Model

Lag	AIC	SC	HQ
0	5.171571	5.446397	5.262668
1	5.189700	5.802626	5.381661
2	5.209209	6.113205	5.485569

Source: Eviews 9

We estimate the ARDL II model by investigating whether there is long run relationship between unemployment, agriculture, industry, construction, trade, and services. The procedure starts with the optimum lag length selection criteria as reported in Table 6. Based on Akaike Information Criterion (AIC) Shwarz Criterion (SC), and Hanna-Quinn Criterion (HQ), one lag length was selected.

Table 7: ARDL Bounds Test for Cointegration (ARDL II Model)
Dependent Variable: ΔUNEMP

Function		F-Statistics	
F(UNEMP/InAGR,InIND, InCONS, InTRADE,InSERVS)		1.283452	
Critical Value	Lower Bound		Upper Bound
1%	3.41	4.68	
5%	2.62	3.79	
10%	2.26	3.35	
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**			
*** Statistical significance at 10%**			

Critical values are obtained from Pesaran et al. (2001). Source: Eviews 9
From Table 7, the bound test results reveal that there is no long run relationship between unemployment and agriculture, industry, construction, trade, and services sectors growth as the F-statistic, 1.283458 is less than all the critical values at the upper and lower bounds. This confirms the invalidity of the Okun's law in the relationship between Unemployment rate and growth in the component parts of GDP in

Nigeria. Hence, we could not go further to estimate the long run coefficients and speed of adjustment of the variables to long run equilibrium.
Since there is no long run relationship among the variables in the system above, we then interpolate the variables of the analysis to determine which of the interpolations may have long run relationship, and the results are presented as follows.

Table 8: Lag Length Selection for ARDL III Model

Lag	AIC	SC	HQ
0	5.344838	5.619664	5.435935
1	5.292186	2.905112	5.484147
2	5.137761	6.041757	5.414121

Source: Eviews 9

We estimate the ARDL III model by investigating whether there is long run relationship between unemployment, agriculture, industry, services, solid minerals, and cement industries. The procedure starts with the optimum lag length selection criteria as reported in Table 8. Based on Akaike Information Criterion (AIC) and Hanna-Quinn Criterion (HQ), two lag lengths were selected.

Table 9: ARDL Bounds Test for Cointegration (ARDL III Model)
Dependent Variable: ΔUNEMP

Function		F-Statistics
F(UNEMP/InAGR,InIND,InSERVS,InSOLD,InCEMT)		3.476937*
Critical Value	Lower Bound	Upper Bound
1%	3.41	4.68
5%	2.62	3.79
10%	2.26	3.35
Note: * Statistical significance at 1% level; ** statistical significance at 5%; * Statistical significance at 10%**		

Critical values are obtained from Pesaran et al. (2001). Source: Eviews 9

From Table 9, the bound test results reveal the existence of a long run relationship between unemployment, agriculture, industry, services, solid minerals, and cement sectors' output growth as the F-statistic, 2.276937 is greater than the critical value, 2.26, at the upper bound at 10% level. We estimate the long run coefficients of the ARDL II model as follows.

Table 10: Estimated Long Run Coefficients of ARDL III Model
Dependent Variable: UNEMP

Independent Variables	Coefficients	P-values
C	-15.87283***	0.0049
InAGR	-6.33316	0.1172
InIND	-2.072659	0.5749
InSERVS	11.41344**	0.0167
InSOLD	0.423828	0.8915
InCEMT	0.389164	0.8773
R2 = 0.872329; F-Statistic = 35.52970 (0.000000)		
Durbin-Watson Statistic = 1.230102		
Note: * Statistical significance at 1% level; ** statistical significance at 5%; * Statistical significance at 10%**		

Source: Eviews 9

From Table 10, agriculture and industrial output growth have long run reducing effect on unemployment in Nigeria but they are not statistically significant. The services sector has positive and statistically

significant effect on unemployment in the long run. Also, the long run impact from solid minerals and cement sectors' output growth on unemployment are positive but not significant. These results also negate the Okun's law which postulates a negative relationship between economic growth and unemployment. The coefficient of determination (R^2) is 0.872329, which implies that 87% of variation in unemployment rate is caused by variation in the explanatory variables. The Durbin Watson statistics is 1.230102 which shows the absence of serial correlation. The F-statistic (35.52970) is significant at 1% which implies that the model is adequate.

The results of the short run relationship are reported in Table 11. The error correction term (ECT(-1)) included in the equation has the correct sign and is statistically significant at 1%. The value of the ECT(-1) indicates a very high speed of adjustment to long run equilibrium. The differenced one period and two period lag values of respective explanatory variables reveal that there is no existence of significant negative or positive relationship between their growth rate and unemployment rate in the short run.

Table 11: Results of Estimated Short Run Coefficients of the Selected ARDL III Model

Dependent Variable: ΔUNEMP

Independent Variables	Coefficients	P-values
C	5.438454*	0.0797
ΔInUNEMP(-1)	-0.013313	0.9666
ΔInUNEMP(-2)	0.066855	0.7998
ΔInAGR(-1)	-1.815762	0.7509
ΔInAGR(-2)	0.782426	0.8599
ΔInIND(-1)	-6.214737	0.1522
ΔInIND(-2)	-4.650592	0.3078
ΔInSERVS(-1)	5.263821	0.5899
ΔInSERVS(-2)	-8.616445	0.4195
ΔInSOLD(-1)	-2.248903	0.5622
ΔInSOLD(-2)	-1.096738	0.7596
ΔInCEMT(-1)	-3.849736	0.3904
ΔInCEMT(-2)	-3.090651	0.4671
ECT(-1)	-0.701862***	0.0005
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**		
*** Statistical significance at 10%. Source: Eviews 9**		

This means that industrial growth and unemployment relationship in the short run do not follow the Okun's law in Nigeria.

Table 12: Lag Length Selection for ARDL IV Model

Lag	AIC	SC	HQ
0	5.882452	6.111474	5.958366
1	5.251224	5.769854	5.413653
2	4.850901	5.61216	5.083625

Source: Eviews 9

The ARDL III model is estimated to ascertain whether there is long run relationship between unemployment, manufacturing, crude oil and gas, trade and transportation industries. The procedure for estimating the ARDL III model also starts with the optimum lag length selection criteria as reported in Table 12. Based on Akaike Information Criterion (AIC), Shwarz Criterion (SC) and Hanna-Quinn Criterion (HQ), two lag lengths were selected.

Table 13: ARDL Bounds Test for Cointegration (ARDL IV Model)

Dependent Variable: ΔUNEMP

Function		F-Statistics
F(UNEMP/InMAN,InCRUG,InTRADE,TRANS)		3.652338*
Critical Value	Lower Bound	Upper Bound

1%	3.74	5.06
5%	2.86	4.01
10%	2.45	3.52
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**		
*** Statistical significance at 10%**		

Critical values are obtained from Pesaran et al. (2001). Source: Eviews 9

The empirical findings of the ARDL bound test results as reported in Table 13 lead to the conclusion that there is a long run relationship between unemployment, manufacturing, crude oil and gas, trade and transportation industries. The F-statistic, 3.652338 is greater than the critical value, 3.52, at the upper bound at 10% level. We estimate and report the long run coefficients as follows using the OLS technique.

Table 14: Estimated Long Run Coefficients of ARDL IV Model

Dependent Variable: UNEMP

Independent Variables	**Coefficients**	**P-values**
C	-25.1482***	0.0072
InAMAN	13.76742**	0.0237
InCRUG	-1.789864	0.4752
InTRADE	-8.260085	0.2022
InTRANS	3.085593	0.3986
R2 = 0.767342; F-Statistic = 22.26251 (0.000000)		
Durbin-Watson Statistic = 0.788489		
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**		
*** Statistical significance at 10%. Source: Eviews 9.**		

From Table 14, only the coefficient of the manufacturing output growth is statistically significant at 5%. However, it has positive effect on unemployment in the long run. The output growth of crude oil and gas, and trade sectors have negative effect on unemployment but they are not statistically significant, while transportation sector has positive but statistically insignificant impact on unemployment in Nigeria. All the results negate the Okun's law which says a negative relationship exists between economic growth and unemployment. The coefficient of determination (R^2) is 0.767342, which means that 77% of variation in unemployment rate is caused by variation in the explanatory variables. The Durbin Watson statistics is 0.788489 which implies the absence of serial correlation. The F-statistic (22.26251) is significant at 1% which means that the model is adequate.

Table 15: Results of Estimated Short Run Coefficients of the Selected ARDL IV Model

Dependent Variable: ΔUNEMP

Independent Variables	**Coefficients**	**P-values**
C	5.243325**	0.0221
ΔInUNEMP(-1)	-0.140543	0.6920
ΔInUNEMP(-2)	0.049242	0.8571
ΔInMAN(-1)	-12.17376	0.2793
ΔInMAN(-2)	2.569117	0.8246
ΔInCRUG(-1)	-0.499621	0.8497
ΔInCRUG(-2)	-0.400386	0.8558
ΔInTRADE(-1)	-4.266394	0.5549
ΔInTRADE(-2)	-3.520147	0.5728
ΔInTRANS(-1)	8.257274	0.5028
ΔInTRANS(-2)	-11.69125	0.2655
ECT (-1)	-0.428223**	0.0309
Note: * Statistical significance at 1% level; ** statistical significance at 5%;**		

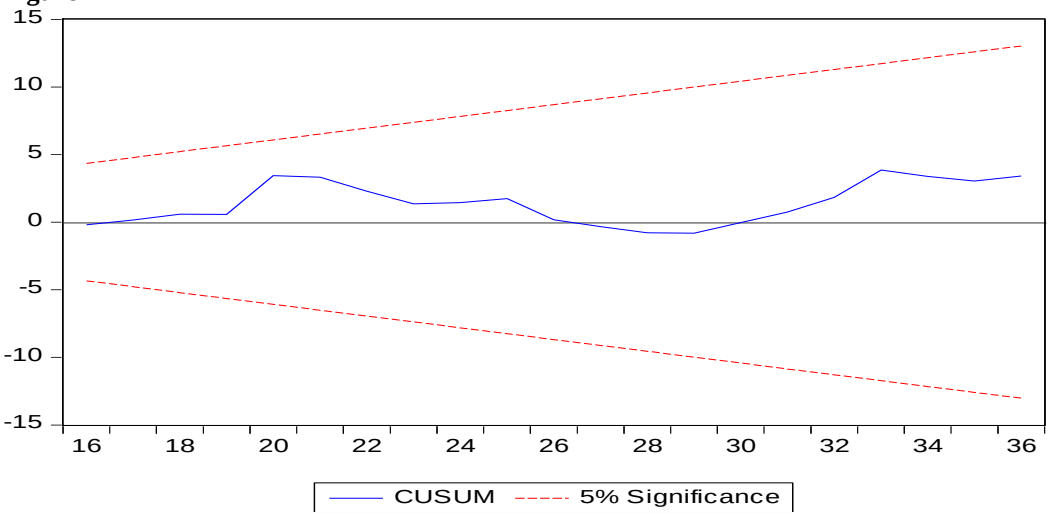
*** Statistical significance at 10%. Source: Eviews 9**

Table 15 shows the results of the short run relationship. The error correction term (ECT(-1)) included in the equation has the correct expected sign and is statistically significant at 5%. The value of the ECT (-1) which is approximately 43% indicates a fairly slow speed of adjustment to equilibrium in the long run. The differenced one period and two period lag values of respective explanatory variables reveal that there is no existence of significant negative or positive relationship between their growth rate and unemployment rate in the short run. This also implies that growth in manufacturing output and unemployment rate does not follow the Okun's law in Nigeria.

Stability Tests

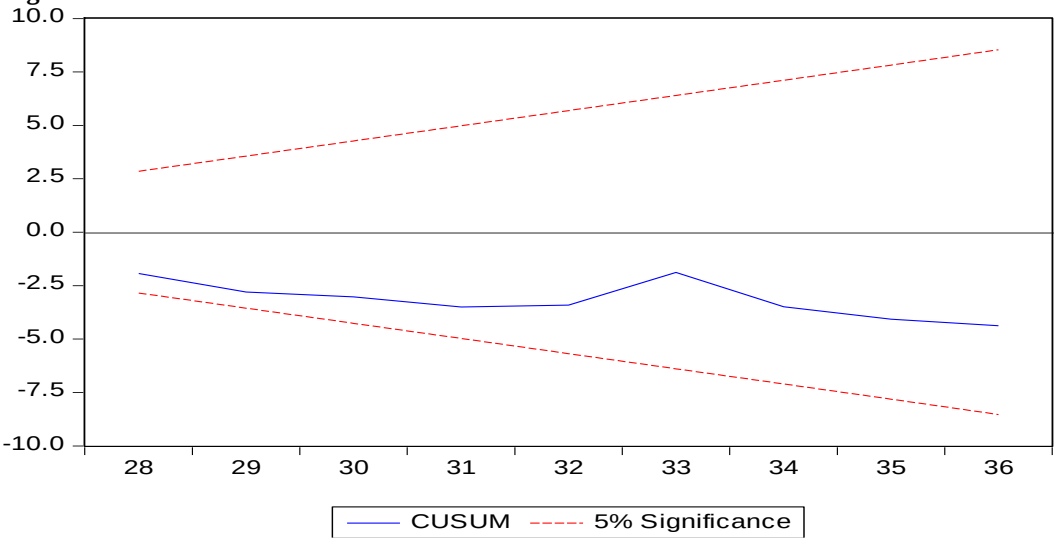
The study examined the stability tests for the three ARDL models that indicate long run relationship among the variables used (i.e. ARDL I, ARDL III, and ARDL IV). We relied on cumulative sum (CUSUM) test and the results are presented below.

Figure 1



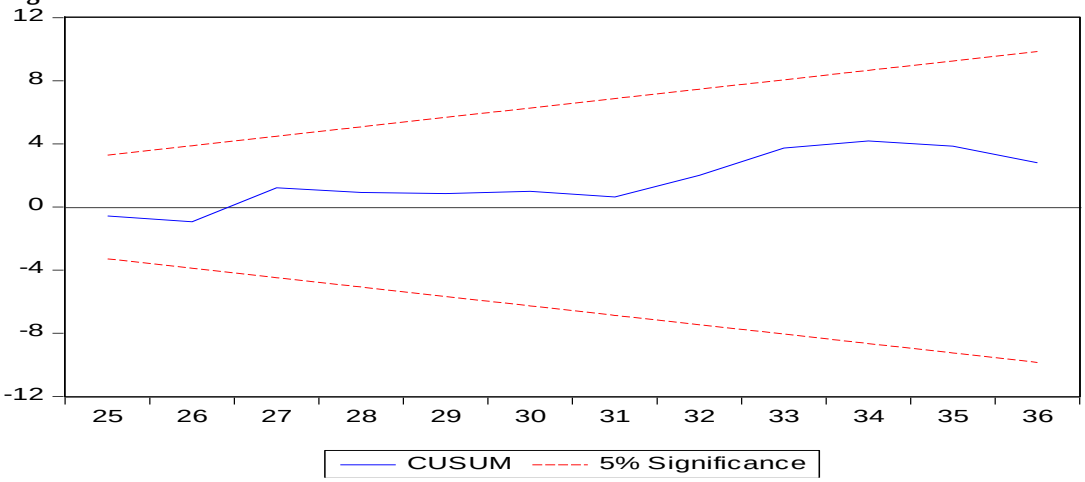
Source: Eviews 9

Figure 2



Source: Eviews 9

Figure 3



Source: Eviews 9.

Figure 1, 2 and 3 plot the CUSUM statistics for the three ARDL equations used in the study. It can be seen the figures that the plot of the CUSUM stays within the critical 5% bounds that confirms the long run relationships among the variables and thus shows the stability of the ARDL models.

Summary and Conclusion

This paper investigates the effect of industrial growth on unemployment in Nigeria. We applied ARDL bound testing, OLS and error correction model (ECM) in the analysis and also used used CUSUM to test the stability of the model used, and it as found that they all stable. The results of the unit root tests indicated that the variables are of mixed stationary properties i.e. I(0) and I(1). The cointegration results show that there is long run relationship among the variables included in three out of the four ARDL equations used. The error correction models examined revealed a relatively high speed of adjustment to equilibrium. From the OLS results on GDP and unemployment, it was revealed that Nigeria's economic growth is positively related to unemployment in the long run, while growth in the short run is unemployment reducing. This implies that economic growth in the long run negates the postulations of Okun's law while that of the short run is in line with the theory.

The result underscores the fact that economic growth in recent times is accounted for largely by factor reallocation from manufacturing and agriculture to trading largely in imported goods and raw materials and other services which do not have the multiplier effects required for sustainable job creation. This is consistent with the tertiarisation of the economy alluded to by Ajakaiye et al (2016). This result is also consistent with the findings of other studies in Nigeria conducted by Babalola *et al.*, 2013; Arewa and Nwakanma, 2012; Akeju and Olanipekun, 2015.

Also the estimated long run relationship between unemployment, services and manufacturing sectors reveal that both sectors positively and significantly contribute to unemployment in Nigeria. This shows that growth in these sectors reduce employment opportunities by increasing importation of raw materials and finished goods. This is compounded by the non- competitiveness of Nigerian manufactures as a result of which Nigerian manufactures are not on demand abroad. The importation of raw materials which could be sourced locally reduces labour participation rate in the Nigerian economy.

The long run findings on crude oil and gas, trade, agriculture, and industry are employment reducing but not statistically significant. This shows that if a linkage is forged between agriculture, oil and gas, manufacturing and services, the input out matrix than would evolve can generate the required multiplier effect that would increase the labour participation rate in the Nigerian economy. The long run results on other sectors (i.e. solid minerals, cement and transportation) reveal that their growth is positively but not significantly related to unemployment. The short run effects of the sectors are largely employment

reducing but they are all not statistically significant. On the whole, the findings on industrial growth and unemployment relationship are not in line with Okun's law.

According to Jose (2006) and Akeju and Olanipekun (2015), to reduce unemployment, the growth rate of GDP must be above the rate of growth of potential output (i.e. the natural growth rate or population growth rate.). As we observed from section 2.5, the rate of growth of GDP over the period of this study has largely been above the population growth rate assumed to be about 2.8%. This suggests that output growth rate should be unemployment reducing in Nigeria.

However, Okun also pointed out that the relationship between output and unemployment is hinged on such intermediate factors as labour force participation rate and the linkage between productivity of real output and unemployment. Where this linkage does not exist, Okun's law may not hold. Thus the lack of proper linkage between agricultural, mining, manufacturing and the tertiary sectors of the Nigeria economy is the reason for the jobless growth being experienced. Thus policy should be directed at forging enduring links between agriculture, mining and industry in Nigeria to reduce unemployment.

Industrialization efforts should be geared towards developing products that would use local raw materials and developing local raw materials for existing manufactured products where such possibilities exist. Government should also provide incentives to encourage the use of local raw materials by manufacturers and for consumption of local products by residents. Agricultural sector should be developed to be able to respond to market incentives to be created through increased demand for agricultural raw materials. To this end, government should finance massive irrigation projects to encourage intensive agriculture to expand production and be able to supply raw materials for industries. For example, to increase the yield of milk and other dairy products for supply to industries, massive green fields should be created by digging boreholes for all year round watering of fields in the areas most suited for pastoral farming instead of making the cattle to roam from north to south and losing weight un the process. There is a need for a big push to ameliorate the infrastructural deficit of the economy in the area of electricity generation and transmission, railways and roads, water and sanitation etc. Massive investment is therefore required in infrastructure and government should invest in aggressive research and development to generate industrial uses for Nigeria's principal agricultural products. The spirit of entrepreneurship and innovation should be encouraged and supported to make use of such products.

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