

The Impact of Unemployment on Economic Growth in Nigeria: An Application of Autoregressive Distributed Lag (ARDL) Bound Testing

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Abstract

This study examined the relationship between unemployment and economic growth in Nigeria. It also determines the effects of unemployment on economic growth in Nigeria. These were with the view to analyze the impact of unemployment on economic growth and proffer recommendations towards enhancing economic growth and reducing unemployment in Nigeria in this present time economic challenges. Annual secondary data sourced from the Central Bank Statistical Bulletin and National Bureau of Statistics covering the period 1986 to 2015 were used. Data collected include unemployment rate and growth rate of Gross Domestic Product. Data collected were analyzed using the ARDL Bound Testing and the Parsimonious Error Correction Model (ECM) of the ARDL Model to test the relationship and analyzed the effect respectively. The findings showed that there is no long- runs relationship between unemployment rate and Economic growth in Nigeria; although, with effective policies, the long-run increase in unemployment has a growth enhancing mechanism on economic growth which is statistically significant ($t=3.748221$, $p<0.01$). Also, results from the short-run Parsimonious Error Correction Model indicate that a 1% increase in unemployment lead to 20.6% increase in real output in the third period which is statistically significant ($t=2.055056$, $p<0.1$). This shows that unemployment in Nigeria is growth enhancing through the informal sector. The Error Correction Term (ECT) shows a speed of adjustment of 65.5% between the short-run disequilibrium and long term equilibrium. The study recommends among others, the need to formulate policies to ensure entrepreneurship development such as the deregulation of the labour market which is likely to reduce unemployment and improve the growth and welfare of Nigerians.

Keywords: Unemployment; Economic growth.

1. Introduction

Unemployment is regarded as a serious problem faced by most developed and developing countries and resulting to socio-economic problems. In justifying this assertion, [Akeju and Olanipeun \(2014\)](#) noted that one of the greatest challenges of the Sub-Saharan African economies today is the high rate of unemployment that has maintained a rising trend over the years. This rising state of unemployment in Nigeria is known by many with its biting presence on an average Nigerian. For example a report by the National Bureau of Statistics (2012) as cited in [Philip et al. \(2013\)](#) put the unemployment rate at 23.9 percent and the unemployed youth population at 20.3 million, about 4.5 million new entrants into the labour market annually, 2.2 million primary school leavers not proceeding to secondary school, one million secondary school leavers not proceeding to the tertiary level and roughly 600,000 graduates annually, not finding any placement after graduation. This tend to put the nation in grave danger, as world bank survey in 2011 reported that 40 percent of those who join militancy movement indicated that they are motivated by unemployment; while 50 percent of those involved in criminal activities are also stimulated by unemployment.

In curtailing unemployment, economic growth has been recognized as a key variable that can address the menace. The contributions of economic growth to economic development cannot be overemphasized as it has been recognized as one of the necessary condition for economic development. It is a medium through which unemployment can be reduced, inflation can be stabilized, innovation can be promoted and a panacea for poverty reduction and eradication in a nation. Economic growth provides the platform for entrepreneurs to emerge who on the other hand reduces unemployment rate through the creation of jobs. [Lewis \(1954\)](#) in a theoretical discourse which was further proved by empirical studies ([Lee, 2000](#)) predicted a declining rate of unemployment as the economic experience significant growth.

Despite [Lewis \(1954\)](#) prediction, the Nigerian economy has remained largely underdeveloped, the huge human and natural resources has remain untapped, the per capita income is low, unemployment also is high despite growth experienced in previous years. This shows that various macroeconomic policies by government have been unable to achieve sustained reduction in unemployment and sustained growth as the economy has plunged into recession in

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recent time. This might not be unconnected to the failure in the macroeconomic management. The essence of macroeconomic management underlines the rationale for the existence of government as a vital economic agent. In the 1960s and early 1970s, the Nigerian economy provided jobs for most Nigerians and absorbed considerable imported labour while inflation rates were low. The wage rate compared favorably with international standards and there was relative industrial peace in most of the years. Following the oil boom of the late 1970s, there was mass migration of people, especially the youth, to the urban areas seeking for jobs (Yelwa *et al.*, 2015). Subsequent the downturn in the economy in the early 1980s, which causes the problems of unemployment, hasty the introduction of the Structural Adjustment Programme (SAP) in 1986.

The post- SAP era and the glut of crude oil price led to the continuous rise in the Gross Domestic Product (GDP) which many prior studies have used in measuring the growth of the Nigerian Economy. Economic growth in Nigeria between 1986 and 2014 never translated into economic development as unemployment has eaten deep into the fabric of the Nigerian economy over the years. The trends in unemployment rates in Nigeria from 1986-2014 in comparison to economic growth have been puzzling. For example, evidence from the Central Bank of Nigeria (CBN), 2015 Statistical bulletin revealed the trends in unemployment rates in Nigeria from 1986-2012 have been oscillating upward from 5.3 percent in 1986 to 24.7 percent by 2012. Although, unemployment rates was at its lowest rates of 1.8 percent and 0.2 percent in 1995 and 1990 respectively (Central Bank Nigeria, 2015); this shows that in year 1990 and 1995, unemployment responded significantly to economic growth as against other years where unemployment kept growing despite the significant economic growth recorded in Nigeria. Visibly, this indicates that the Okun equation which shows an inverse relationship between economic growth and unemployment is not applicable in Nigeria.

In examining unemployment and economic growth nexus around the world, many studies have proved the existent of conflicting relationship between economic growth and unemployment; with some showing a positive relationship while others showing an inverse relationship. These include the works of Alhdiy *et al.* (2015), Lee (2000), Fuad (2011), Geidenhuys and Marinkov (2007) among others.

Similarly, in Nigeria, many studies in this regard have shown controversial evidence. For example, Ademola and Badiru (2016), Akeju and Olanipeun (2014), Arewa and Nwakanma (2012) among other confirm positive relationship between unemployment and economic growth, Sodipe (2008) reported mixed evidence, while Njoku and Ihugba (2011) confirm negative evidence only when growth is motivated by the agricultural sector. Controversies in results might not be unconnected to the methodological differences, data measurement and scope of data applied by the different studies. Evidences shows that the Ordinary Least Square and the Error Correction Model has been the frequently applied method in analyzing this previous studies even when the order of integration do not support the application of it. Also, growth rate of the economy which is computed from the Gross Domestic Product (GDP) has been found to be an efficient way in measuring how an economy has grown over the year. In practice, it is a measure of the rate of change that a nation's gross domestic product (GDP) goes through from one year to another (Investopedia, 2016). In justifying the important of using growth rate against Gross Domestic Product, Motley (2016) in his article noted that Economic growth rate help to know the changes in economic activity in a country as against Gross domestic product (GDP), which measures the value of all final goods and services produced by labor and property in a well-defined geographical area. Many previous studies especially in Nigeria have focused on using GDP which therefore necessitate the use of Economic Growth Rate (ECGR) in this study. In the same vein, many studies have looked at how economic growth affect unemployment while the effect of unemployment on economic growth remain understudy despite evidences have shown that shock which increases unemployment is likely to increase economic growth. It is on this basis that this study seeks to examine the impact of unemployment on economic growth in Nigeria.

2. Literature Review

2.1. Conceptual Literature

2.1.1. The Concept of Unemployment

Aminu and Anono (2012) conceptualized the term unemployment as the total number of people who are willing and able to work, and make themselves available for job at the prevailing wage but no work for them. This therefore, implies that unemployment is a state of joblessness in the country. According to Balami (2006) unemployment is conceptualized as a situation where by a worker is or workers are involuntarily out of work. This means that workers are willing and able to work but cannot find any work. Similarly, unemployment has been defined by the classical economists as the excess supply of labour over the demand for labour which is cause by adjustment in real wage. The Classical or real wage unemployment occurs when real wages for job are set above the market-clearing level, causing number of job-seekers to exceed the number of vacancies.

In the same vein, unemployment was defined by International Labour Organization (2009) as a state of joblessness which occurs when people are without jobs and they have actively sought work within the past four weeks. The unemployment is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by individuals currently in the labour force. In a 2011, Business Week Reported, "More than two hundred million (200) people globally are out of work, a record high, as almost two-third of advanced economies and half of developing economies are experiencing a slowdown in employment growth. Jhingan (2001) posited that unemployment can be conceived as the number of people who are unemployed in an economy, often given as a percentage of the labour force.

2.1.2. The Concept of Economic Growth

In defining Economic growth, Fajingbesi and Odusola (1999) associated it with an increase in capital per head. Since per capital is not the only requirement for growth, this is because if capital is made available without at the same time providing a framework for its use, it will be wasted. Hemming (1991) therefore buttress the fact that growth is influenced by the composition of expenditure, since certain types of spending have more effects on growth. Essential among these types of spending are provision of socioeconomic infrastructure, operations and maintenance, and general administrative and legal frameworks.

According to Balami (2006) Economic growth which is always proxied by GDP often conceptualized as increase in output of an economy's capacity to produce goods and services needed to improve the welfare of the country's citizens. Growth is seen as a steady process which involves raising the level of output of goods and services in the economy. Growth is meaningful when the rate of growth is much higher than population growth because it has to lead to improvement in human welfare. Therefore, growth is seen as a steady process of increasing the productive capacity of the economy and hence, of increasing national income, being characterized by higher rates of increase of per capita output and total factor productivity, especially labour productivity.

2.2. Theoretical Review

The Modified Phillips Curve

The Phillips curve enjoyed some success as it became a popular element of macroeconomic theories soon after and had great influence on the government policy of the 1960s. Because it was regarded as an instrument for economic policy, the government thought they could achieve low unemployment as long as they were willing to tolerate higher inflation and attain price stability through tolerating a higher Unemployment (Blanchard and Illing, 2009). However, during the 1970s the inverse relation between inflation and unemployment however broke apart and most of the OECD member states observed stagflation which means high inflation as well as high unemployment. Although, the Phillips curve could not explain stagflation, a new relation between unemployment and inflation was discovered, namely the inverse relation of unemployment and changes in inflation. This relationship was the foundation for the modified Phillips curve and is still valid and applicable for many developed countries. It has evolved under the pressure of events and the progress of economic theorizing, incorporating at each stage such new elements as the natural rate hypothesis or the NAIRU (Non-Accelerating Inflation Rate of Unemployment), the adaptive expectations mechanism, and most recently, the rational expectations hypothesis.

The Harrod-Domar Growth Model

In economic literature, this model is called capital only model. Harrod (1948) took over from Rostow, because Rostow had some unanswered questions. The model stated that saving is a certain proportion of national income and net investment is defined as the change in capital stock (K). The model further assumes that there is some direct relationship between the size of the capital stock, (K), and total GNP, (Y). This follows that any addition to the capital stock in the form of new investment will bring about corresponding increase in the flow of national output, GNP. This relationship is known in economics as the capital output ratio. If the capital-output ratio is defined as k and assumes further that the national savings ratio, s , is a fixed proportion of national output (e.g. 6%) and that total new investment is determined by the level of total savings.

The Solow Growth Model

This is an economic growth model in which the growth of total GDP is explained by population increase, technical progress, and investment. In this model there is full employment, with an aggregate production showing constant returns to scale. In analyzing the process of economic growth Brian and Howard (2005), Solow (2002) combined the supply and demand sides of the economy together to generate economic growth. He argued that economic growth can best be understood from neo-classical point of view (supply side). Hence, the Solow model can also be referred to as the neoclassical growth model. He assumed that savings is a linear function of income, that capital does not depreciate so that investment is simply the rate of increase of capital stock, that savings is equal to investment, and that labour grows at an exogenous constant proportion, the rate of growth or level of technology is exogenously given. Hence, the Solow model can also be referred to as the neo-classical growth model.

2.3. Empirical Literature

Studies abound from cross countries and international evidence on the validity of Okun law's which show the relationship between unemployment and economic growth. Alhdiy *et al.* (2015) examined the relationship between growth and unemployment in Egypt between 2006 Q1 - 2013 Q2. The results indicated there was no cointegration relationship between the variables of unemployment and GDP specifically implying there is no long-term relationship between the variables. However, in the short term, there is a direct causality relationship have been observed between the unemployment rate to economic growth.

Freeman (2001) uses new developments in trend cycle decomposition to test Okun's Law for a panel of ten industrial countries, that Okun's original estimate for the U.S. of three points for each one percent reduction in the unemployment rate now averages at just under two points of real GDP growth for sample countries Pooled estimates for Europe are smaller than estimates for the rest of the sample. Freeman concluded that the law is still capable of proving estimates of the effects of unemployment on GDP.

Lee (2000) estimated the Okun's equation for all OECD countries and stressed that the relationship is not stable over time and is different across countries, but concluded that the impact of growth on employment is still valid.

Fuad (2011) investigates the relationship between unemployment and economic growth in Jordan through the implementation of Okun's law. Approach: Using annual data covering the period 1970-2008, time series techniques are used to test the relation between unemployment and economic growth and to obtain estimates for Okun's coefficient. Namely, the study used Augmented Dickey-Fuller (ADF) for unit root, cointegration test and a simple regression between unemployment rate and economic growth. Results: The empirical results reveal that Okun's law cannot be confirmed for Jordan. Thus, it can be suggested that the lack of economic growth does not explain the unemployment problem in Jordan.

Geidenhuys and Marinkov (2007) tried to give answer to the question of 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 with more evidence in favour of asymmetries during recessions.

A number of studies have empirically investigated the relationship and effect between unemployment and economic growth in Nigeria using different analytical technique. For example, Ademola and Badiru (2016) in a recent study investigate and determine the effects of unemployment and inflation on economic performance in Nigeria between the period 1981 to 2014. Ordinary Least Square (OLS) technique was adopted with various diagnostic test to determine how fit are the data for the analysis. The result indicated that unemployment and inflation are positively related to economic growth. The positive relationship between unemployment, inflation and RGDP indicates that Nigeria RGDP is driven by oil revenue that employs very limited highly skilled labour and the price of output of crude oil is determined externally which may not response as expected to growth of output in the country.

Amid the rising growth rate and increase in output in Nigeria, Sodipe (2008) studied the extant and the possibilities of having joblessness in Nigeria. A simple model of employment and employment growth was formulated and estimated using the Ordinary Least Squares technique, before and after correcting for stationarity of the time series data using the Hodrick-Prescott filter. The study found that a positive and significant relationship existed between employment and economic growth as well as public expenditure. On the other hand a negative and significant relationship was observed between employment growth rate and growth rate of GDP in the economy. The study advocate for increased labour promoting foreign direct investment and an employment-focused public expenditure programme.

With evidence that the size of the workforce directly impacts on a country's GDP (growth), Njoku and Ihugba (2011) looks at the relationship between unemployment and growth in Nigeria (1985-2009). 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. All things been equal, this should have resulted to 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. The study recommends that the agricultural sector as a medium of reducing unemployment in Nigeria.

In testing the validity of Okun's law in Nigeria, Akeju and Olanipeun (2014) examined the relationship between unemployment rate and economic growth, Error Correction Model (ECM) and Johansen cointegration test were employed to determine both the short run and long run relationships among the variables employed in the study. Empirical findings show that there is both the short and the long run relationship between unemployment rate and output growth in Nigeria and both unemployment and economic growth are positive related, hence, the need to incorporate fiscal measures and increase the attraction of foreign direct investment (FDI) to reduce the high rate of unemployment in the country.

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

In the same vein, Onwachuwu (2015) examined the impact of unemployment on the economic growth of Nigeria from 1985 to 2010. The Ordinary Least Squares (OLS) and Augmented Dickey-Fuller methods are used to estimate the model of one dependent variable (Real GDP growth rate) and two explanatory variables (inflation and unemployment). It was found that unemployment does not have a significant impact on the economic growth of Nigeria.

Similarly, Airi *et al.* (2016) investigate the impact on unemployment on Nigeria economy (1980-2010). By adopting the Ordinary Least Square Regression (OLS), the findings showed that unemployment has a negative effect on the gross domestic product (GDP) of the Nigerian economy.

3. Research Methodology

Theoretical Underpinning and Model Specification

The theory that can be used in explaining the relationship between growth and unemployment is Okun's law. Okun's law is an empirical observation on the relationship between unemployment rate and economic growth. Although many other factors which includes labour market regulation, labor union, etc. have been proved to affect unemployment. For instance, in Japan, unemployment rates tend to vary less for a given gross domestic product

(GDP), due to the strong social job protection. Okun coefficients can change over time because the relationship of unemployment to output growth depends on laws, technology, preferences, social customs, and demographics.

The model for this study is specified below following Okun’s law with some modification and expansion which includes the intercept and stochastic term as specified by Akeju and Olanipeun (2014), hence equation (3.1):

$$U_t - U_{t-1} = \alpha + \beta \left(\frac{GDP_t - GDP_{t-1}}{GDP_t} \right) + \varepsilon_t \quad (3.1)$$

Where: y = The real output product, u = The level of unemployment, ε_t is the error term which satisfy the usual properties, the parameter (β) is known as the Okun’s coefficient and indicates changes in real output caused by changes in unemployment rate.

By simplifying the model where $U_t - U_{t-1} = UN_t$, $\frac{GDP_t - GDP_{t-1}}{GDP_t} = ECGR_t$, equation (3.1) now becomes:

$$UN_t = \alpha + \beta(ECGR_t) + \varepsilon_t \quad (3.2)$$

Where: UN_t is the change in unemployment rate between two periods, while $ECGR$ is Economic growth rate. By re-writing equation (3.2) while making Economic growth becomes the subject of the formula since our focus is on how shock in unemployment will affect economic growth, equation (3.3) emerge.

$$ECGR_t = -\alpha - \beta(UN_t) + \varepsilon_t \quad (3.3)$$

Where: UN = Unemployment rate, $ECGR$ = Economic Growth, α = intercept, β = slope, ε_t = white noise error.

Furthermore, equation (3.3) is re-written following the Autoregressive Distributed Lag (ARDL) bound test suggested by Pesaran *et al.* (2001). The reason was due to evidences that the ARDL approach accommodate variables of different order of integration with the exception of variables which integration are higher than one. Additionally, the ARDL approach accommodates both the short run dynamics with the long-run equilibrium without losing long-run information, hence equation (3.4).

$$\Delta ECGR = -\alpha - \sum_{m=1}^{\rho} \varphi_m \Delta ECGR_{t-m} - \sum_{n=1}^{\rho} \beta_n UN_{t-n} + \psi_1 ECGR_{t-1} + \psi_2 UN_{t-1} + \varepsilon_t \quad (3.4)$$

Where: Δ is the first difference operator, φ_m and β_n are the short-run dynamic coefficients, and α is the drift, while ψ_1 and ψ_2 are the long-run multipliers, ε_t represent white noise errors, ρ is the lag length which will be chosen optimally by the model using Schwarz information criterion (SIC) and Akaike Information Criterion (AIC). The lag length which suggest the less SIC and AIC will be chosen if it pass the stability test.

Data Sources, Description and Estimation Technique

Secondary data have been used in this study. Data on Gross Domestic Product (GDP) were sourced from the publications of Central Bank of Nigeria (CBN) Statistical Bulletin and, while data on Unemployment rate were sourced from the National bureau for statistic (NBS). Data on GDP was further calculated following equation (3.1) to obtain Economic Growth Rate (ECGR) for each year. On a priori expectation, it is expected that a positive shock in economic growth should cause further growth. Also, increases in unemployment should increase economic growth.

To estimate the model, the statistic properties of economic growth and unemployment were considered as well as the lag selection test to determine the lag length of the model. Unit root tests on both variables were carried out using both the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP). The choice of two unit roots was motivated by the urgency of comparison and consistency. According to Hamilton (1994), the PP unit root test is generally considered to have a greater reliability than the ADF because it is robust in the midst of serial correlation and heteroscedasticity, though it has its own shortcomings. Bound test were also employed to test the long run relationship between economic growth and unemployment in Nigeria. Also, a parsimonious error correction model of the ARDL model was estimated to determine the short term dynamic between economic growth and unemployment and the speed of adjustment between the two variables in the case of short-run disequilibrium. The model was finally diagnose for stability.

4. Results and Discussion

Table 4.1 below show the statistical properties of Economic growth and unemployment in Nigeria between the periods 1986 to 2015.

Table-4.1. Descriptive Statistics

	ECGR	UN
Mean	5.091333	11.42667
Median	6.005000	11.85000
Maximum	11.36000	26.30000
Minimum	-0.690000	1.80000
Std. Dev.	3.007561	8.388331
Skewness	-0.128217	0.438622
Kurtosis	2.316130	1.779537
Jarque-Bera	0.666796	2.823860
Probability	0.716485	0.286737
Sum	152.7400	3.428000

Source: Author's Computation using Eview-7, 2017

Findings as seen in [table 4.1](#) showed that the Nigerian economy was growing on the average of 5.09% between the years 1986 – 2015. Also, the maximum economic growth rate from 1986-2014 in Nigeria was 11.36% which occur in year 1990. This high growth in the economy might not be unconnected to the aftermath effect of the structural adjustment program which led to the expansion on the informal sectors. In the same vein, the minimum growth rate of the economy stood at -0.69% which occur in era of SAP implementation. Jarque-Bera statistics of 0.67 and the probability value of 0.72% show that economic growth rate was normally distributed since the null hypothesis of normality is accepted at 72. %.

Unemployment rates stood at 11.42% on the average from 1986-2015 in Nigeria. The maximum unemployment rate from 1986-2015 in Nigeria was 26.3% which occur in year 2015 while the minimum unemployment rate stood at 1.8% in year 1995. This show that growth in Nigeria GDP has not really reduces unemployment as expected as Nigeria experienced a higher economic growth in year 2015 than in 1995. The reason may not be farfetched from the empirical evidence by [Njoku and Ihugba \(2011\)](#) who reported that growth in Nigeria has been motivated by the oil sector which can accommodate only a few numbers of the growing Nigerian labour force. Jarque-Bera value of 2.82 and the probability value of 0.24% show that unemployment rate was normally distributed since the null hypothesis of normality is accepted at 24.37%.

Table- 4.2. Unit Root Test

Variables	Augmented Dickey-Fuller (ADF)			Philip-Perron (PP)		
	Level	1 st Diff.	Order	Level	1 st Diff.	Remark
ECGR	-3.409579**	-	I(0)	-3.409579**	-	1(0)
UN	-0.390577	-6.527516*	I(1)	-0.039543	-6.550768*	1(1)

Source: Author's Computation, 2017

Note: One, two and three asterisk denotes rejection of the null hypothesis at 1%, 5% and 10% respectively based on critical value. For the augmented Dickey –Fuller (ADF) test, the automatic maximum lag length based on Schwarz information criterion is applied. For the Philips-Perron (PP) test, the automatic maximum lag length based on Newey-West Bandwidth is applied.

The unit root estimation shows that the growth rate of GDP is stationary at level for both the Augmented Dickey-Fuller (ADF) test and Philip-Perron (PP), however unemployment variables has unit root problems at I(0) and is made stationary at first difference for both the ADF and PP. Since the order of integration variables is zero and one, we can confidently apply the ARDL bound test in testing for the short and long run dynamism on the two variables. The model will be estimated using the lag length of 5 as it has the lowest value of AIC and SIC compare to the lag length of 2, 3, 4 and 6.

Bound Test for Cointegration Analysis

The Wald statistic was used in testing for the long-run relationship between economic growth and unemployment in Nigeria. The null hypothesis signifying that economic growth (ECGR) is equal to unemployment (UN) is equal to zero was accepted. This was because the F-statistics as presented in [table 4.3](#) is less than both the upper bound critical values and lower bound at 1%, 5% or 10% level of. This implies that there is a no long-run relationship between economic growth in Nigeria and unemployment. This authenticates our findings shown in the statistical properties table on both economic growth and unemployment in Nigeria.

Table-4.3. Bound Test Critical Table

Critical Value (Pesaran et al., 2001)	Lower Bound Value	Upper Bound Value
1%	6.84	7.84
5%	4.94	5.73
10%	4.04	4.78

Calculated F-Statistics = 0.916284, K=1

Source: Author's Computation, 2017

Note: The computed F-statistic: 0.916284 was estimated. Critical Values are cited from [Pesaran et al. \(2001\)](#) Table: Unrestricted intercept and no trend. K is the number of regressors.

Estimated Long-Run Analysis

Despite the absence of long-run relation between unemployment and economic growth in Nigeria, table 4.4 provide the estimates of the likely long-run effect unemployment had on economic growth. The estimation results indicate that with the right policies, increase in unemployment by 1% will cause an increase in economic growth rate by more than one percent (20.7 %) which is statistically significant. This shows that unemployment increase in Nigeria can be growth enhancer in the long-run. The estimation concurred with the findings of Ezi (2014) who noted that increase in unemployment reduces unemployment through the informal sector. This evidence may not be far from the truth as increased unemployment due to SAP in Nigeria causes growth which might likely have been unaccounted for and unemployment reduction which was reflected by the low unemployment rate of 1.8 percent in 1995 (Central Bank Nigeria, 2015) which is roughly 9 years from SAP era.

Table-4.4. Long-Run Estimation Table

Variable	Coefficient
Constant	2.723206 (0.779177)*
UN	0.207246 (0.055292)*
R- Squared	0.334113

Source: Author's Computation, 2017

Note: Standard errors are in parentheses. * denote 1% level of significance.

Table-4.5. Parsimonious Error Correction Model Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.069331	0.376160	0.184312	0.8566
D(ECGR(-2))	0.066759	0.150675	0.443063	0.6650
D(ECGR(-3))	0.059416	0.129881	0.457468	0.6549
D(ECGR(-4))	-0.001514	0.107159	-0.014125	0.9889
D(ECGR(-5))	-0.089646	0.112254	-0.798600	0.4389
D(UN(-1))	-0.078445	0.090879	-0.863184	0.4037
D(UN(-2))	-0.108199	0.097292	-1.112110	0.2862
D(UN(-3))	0.206081	0.100280	2.055056	0.0605***
D(UN(-4))	0.026981	0.106617	0.253068	0.8042
D(UN(-5))	0.065886	0.112537	0.585460	0.5683
ECT(-1)	-0.655004	0.234105	-2.797905	0.0151**
Wald Test on the causality between the joint 5 lag period of UN on ECGR				
Wald test F-statistics (p-value)	1.655496 (0.2145)			
Model Stability/Diagnostic Tests				
R ²	0.667284			
Adjusted R ²	0.411348			
Normality: Jarque- Bera (p-value)	0.319785 (0.852235)			
Serial Correlation: LM Test F-Statistics(p-value)	0.088537 (0.9919)			
Heteroskedasticity Test: Breuch-Pang-Godfrey F-Statistics (p-value)	0.250609 (0.9827)			

Source: Author's Computation, 2017

Note: ** and *** denote 5% and 10% level of significance respectively.

The estimates of the parsimonious error-correction model in table 4.5 indicate that if the correct policy measures is in place, a 1% increase in unemployment in Nigeria in the short-run will increase economic growth by 20.6% in the third period (year) which is statistically significant at 10% and show no significant difference with the long-run estimated effect. The finding agreed with that of Akeju and Olanipeun (2014) on the direction of effect but disagreed on the period the effect will occur as they noted that increases in unemployment in Nigeria will likely cause growth in the first and fourth period.

Our finding also showed that the hypothesis that the 5 lag periods of unemployment in the short-run jointly cause economic growth (ECGR) was rejected. This shows that within the short term period, mass unemployment cause by transitory shock is not likely to increase economic growth immediately, but in the third period, the economy will rebound.

The Error Correction Term (ECT_{t-1}) which assesses the speed of adjustment between the short-run disequilibrium (actual) and the long-run equilibrium (expected) has the correct sign and is statistically significant at 5%. Based on the estimated coefficient, it will take the speed of 65.5% in the case of disequilibrium in the short-run to be corrected in the long-run if the right policy measures are put in place.

Model Stability Check/Diagnosis

The estimated results in table 4.5 suggest that the model has a reasonable good fit with robust diagnostic tests for error processes such as absence of serial correlation, presence of normality and homoskedasticity. The plots of the CUSUM and CUSUMQ test in Figure 4.1 and 4.2 show that the regression is stable within 5% critical bounds

Figure-4.1. Plot of Cumulative Sum of Recursive Residuals

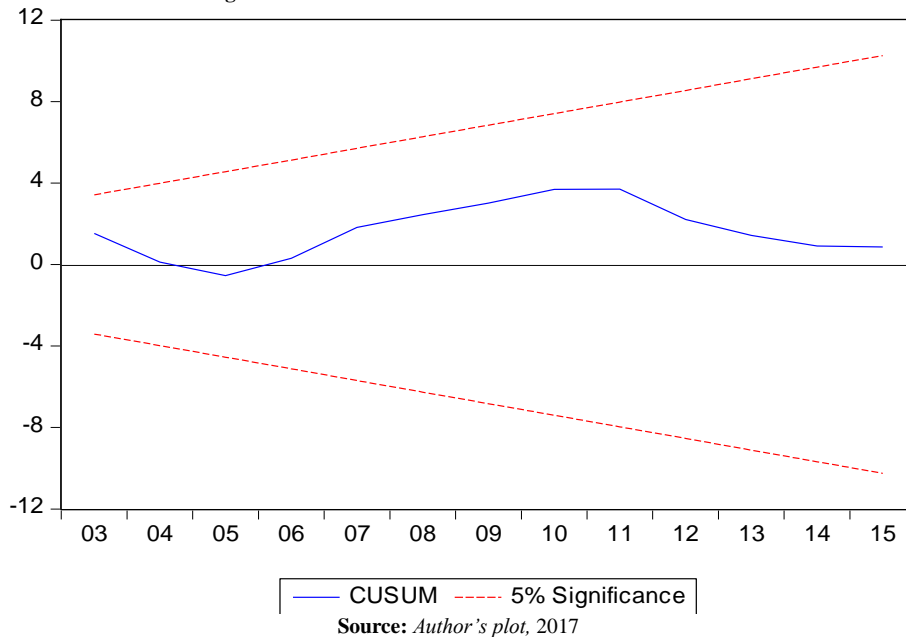
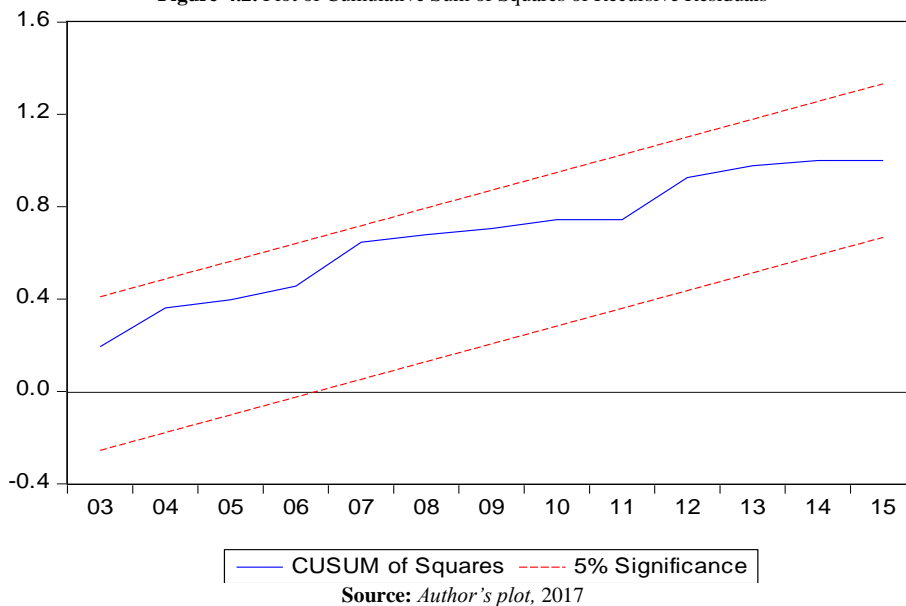


Figure-4.2. Plot of Cumulative Sum of Squares of Recursive Residuals



5. Conclusion and Recommendation

This study revealed that in the short-run, unemployment significantly and positively affects economic growth in Nigeria for the period under study and in the third period. The coefficient of unemployment rate was rightly signed implying that they were consistent with the theoretical expectation of this study. This was attributed to the dominant manifestation of unemployment in Nigeria which was caused by the techniques of production adopted in the country. This study found that the type of unemployment that characterized the Nigerian economy was structural.

This study found out that the reverse Okun's law is only valid in Nigeria in the short run. The economic situation is such that when unemployment increases, economic growth declines in general in the short-run but increases specifically in the third year of the short-run. In the long-run unemployment has the likelihood to create employment which may cause economic growth. This is because as unemployment increases, the unemployed strive for survival which may translate into positive outcomes if policies from the government encourage their efforts.

These findings have significant implications for development programmes and policies introduced by the government of Nigeria which does not aim at declining unemployment rates but creating opportunities outside the oil sector which the unemployed can tap into. It was clearly seen that while unemployment was increasing, the economy

was equally growing or declining. This is as a result of over dependence on oil as a major source of revenue to the nation.

Based on the findings made in the course of this study the following recommendations are made:

- i. Government and its relevant authorities should provide conducive investment environment by removing the structural rigidities that exist in the economy to create jobs. Government should endeavour to provide stable supply of power, good roads for transportation of goods and people, functional legal system, security of lives and property, infrastructural facilities etc. All these would boost employment by making goods and services readily available to meet the ever increasing demand in order to prevent inflation and subsequently lead to industrial expansion and improvement in growth rates of the economy which would provide employment opportunities for the people.
- ii. The need by the government and relevant agencies to formulate policies to encourage self employment and reduce cost of doing business in the country so as to achieve a high, rapid and sustained economic growth while coming up with a strategy to regulate the nation's population growth rate.
- iii. There is also the need to formulate policies tailored towards developing the informal sector of the economy so as to ensure entrepreneurship development which may likely reduce unemployment and improve the welfare and living standards of Nigerians.
- iv. This study found that the type of unemployment characterized the Nigerian economy was structural; hence the need by the government and relevant agencies to encourage skill development, to formulate policies to encourage offshore partnership of the existing firms such as to increase the existing job opportunities and doing business in the country so as to achieve a high, rapid and sustained economic growth.
- v. Deregulation of the labour market should be paramount to destabilize and decongest the long queue of unemployment cause by the high demand for formal employment.

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