

The Relationship between Unemployment and Economic Growth in Nigeria: Granger Causality Approach

Eze Onyebuchi Michael* Atuma Emeka* Egbeoma Nwigboji Emmanuel
Department of Economics, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria

Abstract

The study examined the relationship between unemployment and economic growth in Nigeria; and specifically focused on the impact of unemployment on economic growth for the period 1980-2013. Cointegration test, Vector Error Correction Model (VECM) technique and Granger causality test were employed in the analysis. The variables utilized in the investigation include real gross domestic product (RGDP), unemployment rate (UNEMP) and private consumption expenditure (PCE). Stationarity test was conducted and the results indicated that all the variables except UNEMP were stationary at level; however, UNEMP became stationary after first differencing. The cointegration test result revealed that long run relationship exists among the variables under study. More so, VECM result showed that unemployment has negative and significant impact on RGDP. Finally, the Granger causality results indicated unidirectional relationship between UNEMP and RGDP, with causality running from RGDP to UNEMP. Based on the findings above, the study therefore, recommends that government should as a matter of urgency create more employment opportunities to absorb the teeming population of the unemployed labour force in the country through modernization of the agricultural sector, bring in modern equipment in the facilities of agriculture to make the sector more attractive to all citizens despite one's qualifications and profession, as that alone would go a long way in reducing unemployment level in the country.

Keywords: Nigeria, Economic growth, Unemployment, Cointegration, Granger causality

1. Introduction

Prior to 1970 when crude oil was discovered in commercial quantities alongside its attendant oil boom, Nigeria was an agrarian economy, with agricultural sector accounting for over 60% of the total gross domestic product (GDP) in the economy. It also contributed largely to foreign exchange earnings, government revenue, and provided food requirements of the economy, as well as supplied industrial raw materials to industries. In this view, agricultural sector was highly depended on for growth and development, and also as a means of creating employment opportunities to unemployed labour force in the country. However, with the discovery of crude oil and its attendant oil boom in 1970s, oil sector became the major source of foreign export earnings and government revenue. Consequently, the contributions of agricultural sector to growth and development of the economy began to falter due to agricultural sector neglect by government toward developing overdependence on oil sector. Thus, the unexpected wealth generated from the oil boom, coupled with the country's shift from the popular agricultural activities to oil sector led to wasteful expenditures in the public sector, dislocation of employment factors and distortion in the revenue bases for policy planning in the national economy. This development in turn, led to higher unemployment and worsened the economic situation of the country. In this sense, Aminu et al. (2013) revealed that Nigerian economy has remained largely undeveloped despite its abundant human and natural resources, and as a result, the economy is still characterized by low per capita income, high unemployment and inflation, balance of payment deficit, debt burden and other socio-economic challenges facing the nation.

Okun's (1962) cited in Kemi & Dayo (2014) argued that unemployment has negative relationship with economic growth. Hence, change in aggregate demand leads to change in industrial production pattern that in turn result to change in labour demand which alters unemployment positions of a country. In Nigeria, unemployment problem assumes different dimensions because it included underemployment. Under this situation, some people are employed and are under paid thereby depriving them the ability to meet their basic needs such as food, clothing and shelter. Kemi & Dayo (2014) also discussed another case of unemployment in the country such as disguised unemployment. This type of unemployment according to them deals with a situation where people accept jobs that are below their educational qualifications and experience. Thus, unemployment in Nigeria is classified into cyclical unemployment, structural unemployment, frictional unemployment and classical unemployment. While structural unemployment is associated with globalization and technological advancement in which human labour is replaced with machinery in production process, cyclical unemployment results from insufficient aggregate demand in the economy which in turn discourages production, as it reduces the number of workers in the economy. Frictional unemployment on the other hand, occurs when worker's skills mismatched the underlying jobs. Furthermore, classical unemployment surfaced when the wage rates of workers is set above the equilibrium prices and therefore causes excess supply of labour in such a manner that labour market exceeds the existing vacancies.

Statistics showed that total unemployment level in Nigeria in 1970 stood at 4.3%, and rose to 6.4% in

1980s (CBN, 2003 cited in Akintoye, 2003). In the same view, Odusola (2001) revealed that the national unemployment rate of Nigeria hovered around 6% and increases to 7% in 1987. By 1995, the national unemployment rate declined to 1.9%, after which it increased to 2.8% and 13.1% in 1996 and 2000 respectively. By first quarters of 2006 and 2007, the unemployment rates in the country stood at 13.6% and 14.6% respectively, and rose to 19.1% and 23.9% in 2010 and 2011 respectively. However, real gross domestic product (RGDP) growth rate in 1980 stood at 5.34%; and in the year 1985, it rose to 9.52%. By 1990, 1995, 2000, 2005 and 2010, the growth rates of the RGDP were 13.02%, 2.16%, 5.44%, 6.51% and 7.98% respectively (CBN, 2012). Similarly, Kayode et al. (2014) expressed that unemployment is one of the developmental challenges confronting economic development of Nigeria. Although in the history of Nigerian economic development, statistics showed that unemployment has ever been high since 1980s, hence, the available reports in both from internal and international bodies indicate that the highest level of unemployment is now recorded in the Nigerian economy. Based on the above, governments at all level have tried to reduce unemployment level and its scourge on the economy at one time or the other in Nigeria by enunciating various employment policies such as the creation of National Directorate of Employment (NDE) in 1988 and its skills acquisition programmes such as NAPEP, SURE-P, YOUWIN, N-POWER, among others in order to promote economic growth through employment creation.

Besides, Nigeria has overtime claimed strong real gross domestic product (RGDP) growth rate which measured at 6% or 6.5% from 2002 till 2015 (Aganga, 2010 and Ogunmade, 2013 cited in Kayode et al., 2014). However, this claim has appeared to be paradox. This is because, while the country was recording strong growth rate of economic growth of 6.5%, unemployment rate was at the same time rising and annual unemployment rate rose from 11.9% in 2005 to 19.7% in 2009, and over 37% in 2013 (Aganga, 2010 and Ogunmade, 2013 cited in Kayode et al., 2014). This economic growth is yet to reflect to economic development of the country as poverty level and income inequality are still high, technological development is still at rudimentary stage, infant mortality rate and child mortality rate are still high, industries are still in shambles and development index of Nigeria is still very low. According to ILO (2012), unemployment is one of the biggest threats to social stability in many countries; Nigeria is inclusive. When compared with other countries of the world, unemployment crisis in Nigeria is more serious. For example, in South Africa, unemployment rate stood at 25.2% and was 14% in Ghana in 2010, whereas in Nigeria, unemployment was 37% in 2010. The instability in the economic growth, as well as the increases in the unemployment level of the nation was blamed on the economic depression occasioned by drastically decline in the international market price of oil in 1980s. In order to tackle this economic downturn in the economy, government of Nigeria embarked on implementation of stabilization policies such as import restriction and export promotion policies. Although the stabilization policies were implemented in order to stimulate economic activities, it has appeared not to be solving the problem of the economy, as many companies then produced below their installed capacities due to the difficulties associated with sourcing of industrial raw materials in both locally and externally due to naira exchange rate depreciation. Consequently, the general price level of goods and services soar, and real wages of labour and purchasing power of the wage earners, and aggregate demand in the economy declined as well. It was against this background that IMF-World Bank supported structural adjustment programme (SAP) and other economic reforms were adopted in 1986 by Nigerian government in order to promote economic activities in the economy. In view of the above, this study investigates the causality between unemployment and economic growth with the aim to determine the direction of causal relationship between the two variables.

2. Review of Related Literature

2.1 Theoretical Review

The main theoretical review underpinning this study includes the Keynesian unemployment theory, Marxist theory of unemployment, Okun's theory of unemployment, and traditional neoclassical growth theory. The above listed theories explain the relationship existing between unemployment and economic growth in the development process. In this sense, Kemi & Dayo (2014) was of the opinion that the growth rate in gross domestic product in an economy leads to increase in employment level and decrease in unemployment. Udu & Agu (2005) cited in Kayode et al. (2014) explained unemployment as those persons capable and willing to work at prevailing wage rate but are unable to find job at a particular period of time. International Labour Organisation (2007) described unemployment as the unemployed labour force that are not working but are available, willing and able to work for a prevailing, and are actively searching for jobs. Onwachukwu (2015) stated that level of unemployment is very important determinant of growth and development of a country. No country can claim to be developing, while it is experiencing high level of unemployment, poverty and income inequality. This implies that level of unemployment has an important role to play in economic growth process of an economy. Thus, the theories below explain the relationship between unemployment and economic growth as it relates to this study.

2.1.1 The Keynesian unemployment theory

The Keynesian theory of unemployment is otherwise known as cyclical or deficient demand theory of

unemployment. The theory explained that ineffective demand in an economy is the primary cause of unemployment in which those that are willing to work at a prevailing wage rate are unable to find job at a given time (Obadan & Odusola, 2010). Furthermore, the theory argued that as demand for goods and services decreases, production level reduces and hence, few workers are needed in the production process. The Keynesian theory also emphasized that since the number of unemployed work force would always exceeds job vacancies, so that even if full employment is attained, some labour force will still remain unemployed due to mismatch in the economy. Keynes therefore, conceived that lack of effective demand for jobs can be resolved by intervention of government through deficit spending which can boost employment level and increases aggregate demand in the economy. In Nigeria for instance, unemployment crisis appears to worsen economic situation of the country, especially in the last three decades due to embargo laid on employment by different level of governments where about 121,731 workers were disengaged from public service between 2006 and 2007. During the first phase of the rightsizing process in 2005 in the public service reform, not less than 30,000 workers of the core civil service were disengaged from service (Adegoro, 2006 cited in Obadan & Odusola, 2010).

2.1.2 Marxist theory of unemployment

This theory was propounded by Karl Marx in 1863. The theory argued that unemployment in any economy is inherent due to insatiable nature of capitalist system. Capitalist unfairly manipulates the labour market by causing unemployment that in turn leads to low demand for labour and wages. The theory therefore, suggested that the best way of reducing unemployment is by abolishing capitalism, as well as the system of forced competition for wages, and then shift to socialist economic system.

2.1.3 Okun's theory of unemployment

Okun's law focused on the explanation of the relationship between unemployment and economic growth in an economy. The theory argued that unemployment has negative correlation with economic growth in any given economy. It believed that a percentage decrease in unemployment rate leads to 3 percent increase in economic growth (Okun's, 1962). When the growth rate of unemployment rose by 1% above the trend rate of growth, it can only result to 0.3% reduction in unemployment. In testing the validity of the theory, Kwani (2005) found that Okun's theory of unemployment indeed showed existence of inverse relationship between unemployment and economic growth. The validity of the theory was tested by employing US real GDP data and the result indeed supported the theoretical relationship of unemployment and economic growth. More so, Freeman (2007) stated that if real GDP performance increases by 3% and unemployment reduces by 0.3%, it implies that the increase in the real GDP performance for each percentage reduction in unemployment rate accounts for average 2% growth rate in real GDP of the country.

2.1.4 Traditional neoclassical growth theory

The traditional neoclassical growth model is an outgrowth of the Harrod & Domar (1957) and Solow (1956). The model focused on the importance of saving in an economy. In the model, growth model was expanded through Harrod-Domar postulation by adding labour as a second factor and technology as additional variable in the growth equation. Unlike the fixed coefficient, constant returns to scale assumption of the Harrod-Domar model, neoclassical growth model of Solow exhibited diminishing returns to labour and capital separately and constant returns to both factors jointly. Technological progress became the residual factor explaining long term growth, and its level was assumed by Solow and other growth theorists to be determined exogenously. The main proponents of the neoclassical growth model include Solow (1956) and Phelps (1961). In that, it was observed that neoclassical model plays the role of coordinating and integrating various works in macroeconomics, national economics and public finance. Solow (1956) cited in Mustafa, (2011) argued that when production takes place under neoclassical conditions of variable proportions and constant returns to scale, there would be no opposition between natural and unwarranted rates of growth. This implies that the system is self adjusting to any given rate of growth of labour force and eventually approaches a state of steady proportional expansion.

2.2 Empirical Review

Hussain et al. (2010) investigated the causality between growth and unemployment in Pakistan for the period 1972-2006 and found that unemployment has negative relationship with economic growth in Pakistan. Similarly, Zagler (2006) examined the links between growth and unemployment in the United Kingdom for the period 1982-1999, and the result indicated negative relationship between unemployment and growth in the economy of United Kingdom. Oluyomi & Ogunrinola (2011) studied the relationship between employment and economic growth in Nigeria for the period 1986-2010, and found that positive and significant relationship exists between employment and the real GDP in the economy. Stephen (2012) investigated the impact of unemployment on economic growth in Nigeria for the period 1980-2008, and the study found that unemployment has negative relationship with economic growth in Nigeria.

Furthermore, Swane & Vistrand (2006) examined the relationship between gross domestic product and employment growth in Sweden, and found that significant and positive relationship exists between RGDP and employment growth in Sweden. This finding supported the strand of theory suggesting that the positive

relationship between RGDP and employment is normal and that any observed jobless growth might just be a temporary deviation. Asoluka & Okezie (2011) analyzed the relationship between unemployment and economic growth in Nigeria for the period 1985-2009; and revealed that unemployment has inverse relationship with economic growth in the economy. Aminu et al. (2013) investigated the effect of unemployment and inflation on economic growth in Nigeria for the period 1986-2010. The study revealed that unemployment and inflation have positive impact on economic growth of Nigeria. However, the result showed that unemployment has insignificantly effect on economic growth in the economy. Haruna et al. (2013) empirically investigated the relationship between financial sector development and unemployment in Nigeria for period 1980-2011. The study found persistent high unemployment in the economy, while formal credit allocation in rural areas has both short run and long run effects in reducing unemployment. Ejikeme (2014) investigated the relationship among unemployment, poverty and insecurity of lives and properties in Nigeria for the period 1980-2012. The study revealed that unemployment and poverty have positive relationship with security challenges in Nigeria. Ohajianya (2012) analyzed household unemployment rate in Imo State, Nigeria and the study found that unemployment has direct link to poverty and insecurity in the state.

Zaleha et al. (2007) examined the relationship between output and unemployment in Malaysia using Okun's method of analysis. The results showed that negative relationship exists between output and unemployment in the economy. Ahmed & Ambreen (2014) investigated the economic determinants of unemployment in Pakistan for the period 1973-2010, and found that unemployment has significant and positive relationship with output growth, productivity and economic instability in the country. Philip (2014) investigated the impact of government expenditure on unemployment and poverty rates in Nigeria for the period between 1981 and 2011. The study found that government expenditure has positive and significant impact on unemployment rate, whereas government expenditure has negative and insignificant impact on poverty rate in Nigeria. Mercy & Christie (2014) investigated the dynamics of poverty reduction policy in relation to youth unemployment in Nigeria. The study revealed that some segment of the youth population in Nigeria live below poverty line as a result of unemployment. Kareem (2015) studied the relationship between employment and economic growth in Nigeria, and the results showed that foreign direct investment, inflation and interest rate have positive relationship with employment rate in the economy. Oye et al. (2011) examined the impact of unemployment on real gross domestic product (RGDP) in Nigeria for period 2000-2008. The result showed that unemployment has impact on real gross domestic product (RGDP) and that inverse relationship exists between unemployment and real gross domestic product (RGDP) in Nigeria.

Kemi & dayo (2014) investigated the relationship between unemployment and economic growth in Nigeria with the aim of testing the applicability of the theoretical proposition of the Okun's law which postulated that unemployment has negative relationship with economic growth. In order to achieve empirical result in the investigation, the study employed econometric methods such as error correction model (ECM) and Johansen cointegration techniques to examine both the short run dynamics and long run relationship among the variables. The variables used in the study include real output growth, unemployment rate. The result indicated that both the short and the long run relationship exist between unemployment rate and real output growth in Nigeria. Kayode et al. (2014) studied the factors responsible for high unemployment in Nigeria and as well examined its social, economic and political implications. The study demonstrated that corruption in public and private sectors, as well as at the individual levels, decay of industrial sector and agricultural sector neglect are the major factors responsible for high unemployment and other scourge associated with unemployment. The finding of the study also showed that youth restiveness, widespread poverty, criminal activities and high rate of social vices are prevalent due to idleness.

Similarly, Amassoma & Nwosa (2013) examined the relationship between unemployment rate and productivity growth in Nigeria for the period between 1986 and 2010, using Johansen cointegration test and error correction model (ECM) technique. Stationarity test was conducted through the applications of the Augmented Dickey-Fuller (ADF) and Phillips-Perron unit root tests, and the results showed that all the variables were integrated of the same order at first difference. The results of the Johansen cointegration test indicated that long run equilibrium relationship exist among the variables under study. Nwankwo (2014) investigated the impact of unemployment on Nigerian economic development using a selected local government area in Anambra State, Nigeria. The results indicated that unemployment has negative impact on economic growth and development of the state.

3. Data and Research Methodology

In order to empirically examine the relationship between unemployment and economic growth in Nigeria, the study employed annual statistical data obtained from the Central Bank of Nigeria (CBN) statistical bulletin for the period ranging from 1980 to 2013 on real gross domestic product, unemployment rate and private consumption expenditure. Cointegration test, Vector Error Correction Model (VECM) technique and Granger causality test were employed in the analysis. The cointegration test is applied to examine the long run

equilibrium relationship among the variables, while the VECM is employed to investigate the short run dynamics and long run relationship among the variables under study. The Granger causality on the other hand, examines the causality between unemployment and economic growth in Nigeria.

3.1 Model Specification

The model expressing the relationship among real gross domestic product (RGDP), unemployment rate (UNEMP) and private consumption expenditure (PCE) is represented as follows:

$$RGDP = f(UNEMP, PCE) \quad (1)$$

Where,

RGDP represents real gross domestic product as a common measure for economic growth, UNEMP is unemployment rate which represents the total unemployment level in the economy for the period under review, while PCE depicts private consumption expenditure that illustrates demand status of the private sector in the economy. The equation 1 above is further illustrated in linear form as:

$$RGDP_t = \varphi_0 + \varphi_1 UNEMP_t + \varphi_2 PCE_t + e_t \quad (2)$$

Where,

RGDP is the dependent variable; UNEMP and PCE are the explanatory variables; φ_1 and φ_2 are the linear coefficients of the equations, φ_0 is the constant term and e_t is the stochastic variable.

3.2 Estimation Procedures

3.2.1 Unit Root Test

This stage of estimation procedure tests the stationarity of the variables employed in the study. It helps to determine the order of integration of the data series by applying the Augmented Dickey-Fuller (ADF) unit root test, postulated by Dickey & Fuller (1981). This test is adopted in order to find the long term properties of the variables in the study. If the time series are found to be stationary, it means that their variance, mean and covariance are constant overtime and that the result obtained from their analysis is reliable and can be used to predict future economic activities of the economy. The ADF test is conducted through the following models.

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum_{i=1}^n \alpha_i \Delta y_{t-i} + e_t \quad (3)$$

$$\Delta y_t = \alpha_0 + \alpha_1 y_{t-1} + \sum_{i=1}^n \alpha_i \Delta y_{t-i} + \delta t + e_t \quad (4)$$

Where;

Y is a data series, t is linear time trend, Δ is first difference operator, α_0 is constant, n is optimum number of lags in the development variable and e_t is stochastic variable. Meanwhile, if the ADF result fails to reject the test in levels but rejects the test in the first difference, it means that the series contains one unit root and is of integrated order one. More so, if the test fails to reject the test in levels and at first difference but rejects it in second differences, it therefore implies that the series contains two unit roots and is of integrated order two.

3.2.2 Cointegration Test

The second estimation procedure involves the test of the level of cointegration among the data series of the same order through the application of the Johansen cointegration test. The implication is that, if in the long run, two or more series move closely together, whether the series itself is trended, the difference between them is constant. In theory, they can wander arbitrarily far away from each other. According to Johansen & Juselius (1990), achieving empirical result amount to establishing maximum-likelihood test procedure. The Johansen cointegration model is shown below.

$$\lambda \text{ trace } (r) = -T \sum_{i=r+1}^{\Lambda} \ln(1 - \lambda_i) \quad (5)$$

Where;

T= number of usable observations, λ = estimated eigenvalue from the matrix; λ trace tests the null hypothesis, which states that the number of distinct cointegrating vector is less than or equal to q as against the general unrestricted alternatives. So rejecting the null hypothesis means that the data series contain unit root and must be differenced at least once to achieve stationarity.

3.2.3 Vector Error Correction Model (VECM)

This step of estimation procedure is possible if the results of the cointegration test showed evidence of long run relationship among the variables. The conventional vector error correction model (VECM) is employed to examine the short run dynamics and cointegrating equation among the series. The term 'error correction term' is estimated for the coefficients, such that when the series fails to cointegrate, it means that the short run model

becomes the next estimation method. The concept of VECM is used to explain the relationship existing between short run dynamics and long run equilibrium relationship among the data series. The application of VECM is necessary as it is used to correct temporary short run deviation of series from the long run equilibrium relationship. The model for VECM is presented as follows:

$$\Delta Y_t = a_0 + a_1 \Delta X_t + a_2 U_{t-1} + \varepsilon_t \quad (6)$$

Where;

$Y_t = Y_t - Y_{t-1}$, a_1 and a_2 represent the dynamic adjustment coefficients of the variables, while U_{t-1} is the residual lag; it represents the short run deviation from the equilibrium position, it is estimated to correct long run equilibrium error, ε_t represents the random error term. The decision to apply VECM which based on ordinary least square (OLS) is borne out from the fact that the study employed more than one explanatory variable. So there is need to apply the method in the investigation. The model is illustrated below.

$$\Delta \text{LRGDP}_t = \beta_0 + \beta_1 \Delta \text{LRGDP}_{t-1} + \beta_2 \Delta \text{UNEMP}_{t-1} + \beta_3 \Delta \text{PCE}_{t-1} + \text{ECM}_{t-1} + U_t \quad (7)$$

Where;

Δ is change in natural logarithm of the variable; for instance, ΔLRGDP_t represents a change in natural logarithm of the real gross domestic product, β_0 is constant term, β_1 , β_2 , β_3 and β_4 are the parameters of the explanatory variables, ECM is error correction model and U_t is the error term of long run equilibrium error. The method of vector error correction model is estimated to investigate the dynamic behaviour of the relevant variables of the study, following the confirmation of long run equilibrium relationship.

3.2.4 The Granger Causality Test

The third stage of the estimation procedure examines the causality between unemployment and economic growth through the application of the Granger causality test propounded by Engle & Granger (1989). It focused on determining the nature of relationship between the two variables; that is, to determine whether the direction of the relationship is bi-directional, unidirectional, feedback or no causation between the two variables. Thus, the model is specified as:

$$\text{RGDP}_t = \lambda_0 + \sum \lambda_{1t} \text{UNEMP}_{t-1} + \sum \lambda_{2t} \text{PCE}_{t-1} + \varepsilon_{1t} \quad (8)$$

$$\text{UNEMP}_t = \beta_0 + \sum \beta_{1t} \text{RGDP}_{t-1} + \sum \beta_{2t} \text{PCE}_{t-1} + \varepsilon_{2t} \quad (9)$$

Where;

RGDP = Real Gross Domestic Product, UNEMP = Unemployment Rate, PCE = Private Consumption Expenditure, ε_t = error term, t = current period, $t-1$ = lag period.

4. Data Analysis and Discussion of Empirical Results

4.1 Augmented Dickey-Fuller (ADF) Unit Root Test

Table 1. Augmented Dickey-Fuller (ADF) Stationarity Test at both Levels and First Difference

variables	Level			1st Difference			Remarks
	ADF Statistic	5% Critical Value	10% Critical Value	ADF Statistic	5% Critical Value	10% Critical Value	
RGDP	-6.209573	-3.552973	-3.209642	-17.73008	-3.557759	-3.212361	I(1)
UNEMP	-3.048171	-3.552973	-3.209642	-7.792109	-3.557759	-3.212361	I(1)
PCE	-6.114554	-3.552973	-3.209642	-9.521757	-3.557759	-3.212361	I(1)

Source: Researcher's compilation from E-view 7

The table 1 above depicts stationarity test of the time series employed in this investigation through the application of the Augmented Dickey-Fuller (ADF) stationarity test. The results of the test indicate that all the variables except UNEMP; that is, RGDP and PCE were stationary at level; however, the variable of UNEMP became stationary after first differencing at 5% and 10% critical values. This claim is supported by the ADF statistics and the critical values as shown in the table above. In the table, the ADF statistics of the variables such as unemployment conducted at level is less than the critical value, while other variables such as RGDP and PCE are stationary at level. However, after first differencing, the ADF statistics of all the variables are greater than the critical values, which imply that all the series became integrated of the same order after first differencing. The attainment of stationarity of the variables as indicated in the first difference implies that their variance, mean and covariance are constant overtime and that long term properties of the series are established.

4.2 Co-integration Test

Table 2. Unrestricted cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.996124	203.4663	29.79707	0.0001
At most 1 *	0.487641	25.77026	15.49471	0.0010
At most 2 *	0.127674	4.370940	3.841466	0.0366

Source: Researcher's compilation from E-view 7

Table 3. Unrestricted cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.996124	177.6961	21.13162	0.0001
At most 1 *	0.487641	21.39932	14.26460	0.0010
At most 2 *	0.127674	4.370940	3.841466	0.0366

Source: Researcher's compilation from E-view 7

Tables 2 and 3 represented the analysis of cointegration test through the application of Johansen cointegration test. The results indicated three co-integrating equations in both the trace statistic and the max-eigen statistic respectively. In Johansen cointegration method, the trace statistic and max-eigen statistic in any investigation determines level of cointegration among the data series employed in the study. In this sense, the results of the Johansen cointegration test in this study indicate long run relationship among the variables such as RGDP, UNEMP and PCE by indicating three cointegrating equations. Judging from the results, the study rejects the null hypothesis of no long run relationship and concludes that long run relationship exist among the variables under study. Specifically, the result showed that unemployment has significant long run relationship with economic growth in Nigeria.

4.3 Vector Error Correction Model (VECM)

Having established the existence of long run equilibrium relationship among the variables employed in the study through the application of Johansen cointegration test, the study proceed to carry out the estimation of the vector error correction model (VECM) in order to examine the short run dynamics and long run relationship among the variables of the study. The estimation result of the test is presented below:

Table 4. Vector Error Correction Model (VECM)

Cointegrating Eq:	CointEq1		
RGDP(-1)	1.000000		
UNEMP(-1)	-0.856307 (0.24267) [-3.52862]		
PCE(-1)	0.262932 (0.11578) [2.27093]		
C	-99.10865		
Error Correction:	D(RGDP)	D(UNEMP)	D(PCE)
CointEq1	-0.406874 (0.16545) [-2.45925]	-0.131600 (0.06768) [-1.94459]	-156.4736 (83.7022) [-1.86941]
D(RGDP(-1))	-0.306553 (0.18164) [-1.68768]	0.054972 (0.07430) [0.73986]	19.06563 (91.8962) [0.20747]
D(RGDP(-2))	-0.119110 (0.04323) [-2.75507]	0.006639 (0.01768) [0.37540]	-27.82796 (21.8725) [-1.27228]
D(RGDP(-3))	-0.053438 (0.05770) [-0.92610]	0.062224 (0.02360) [2.63629]	20.67165 (29.1926) [0.70811]
D(UNEMP(-1))	0.043167 (0.16390) [0.26337]	0.082245 (0.06704) [1.22677]	50.15273 (82.9195) [0.60484]
D(UNEMP(-2))	0.086873	0.001079 (0.05887)	55.13441 (72.8103)

	(0.14392) [0.60363]	[0.01833]	[0.75723]
D(UNEMP(-3))	-0.125948 (0.12363) [-1.01876]	0.093183 (0.05057) [1.84267]	56.28851 (62.5459) [0.89996]
D(PCE(-1))	0.106414 (0.04328) [2.45882]	0.034011 (0.01770) [1.92120]	39.95729 (21.8955) [1.82491]
D(PCE(-2))	0.106366 (0.04314) [2.46545]	0.034633 (0.01765) [1.96252]	39.71847 (21.8266) [1.81973]
D(PCE(-3))	0.051218 (0.04880) [1.04952]	0.008290 (0.01996) [0.41528]	-5.772942 (24.6892) [-0.23382]
C	-40.82414 (16.6990) [-2.44470]	-12.60765 (6.83068) [-1.84574]	-15313.08 (8448.36) [-1.81255]
R-squared	0.577640	0.963929	0.665369
Adj. R-squared	0.355345	0.944944	0.489247

Source: Researcher's compilation from view 7

In table 4 above, the result showed the value of error correction term (ECT) as -0.406874, which implies that the relationship between the variables met a priori expectation of the study, and that the condition for stability is satisfied. The negative sign and fractional value of the ECT with its t-statistical value of -2.45925 implies that the result is desirable and that it falls within the accepted region. This indicates that, the speed of adjustment for a deviation of the series from short run towards long run equilibrium relationship is high. More so, the coefficient value of unemployment (UNEMP) is shown as -0.125948, whereas its associated t-statistical value is -1.01876. This means that unemployment has negative and significant relationship with real GDP for the period under review. Similarly, the result revealed that the coefficient value of private consumption expenditure (PCE) is 0.051218, with its t-statistical value being 1.04952, and this implies that PCE has positive and significant impact on real GDP. The result also showed the value of R-squared (R^2) as 0.577640. This indicates that 57.8% of the variations in real GDP are explained by the explanatory variables, while the remaining 42.2% of the variations is attributed to the effects of other variables not included in the model. This finding of the study is therefore in line with the findings of Hussain et al. (2010), Zagler (2006), Stephen (2012), and however, negates the findings of Oluyomi & Ogunrinola (2011), Asoluka & Okezie (2011), Aminu et al. (2013) and Ambreen (2014).

4.4 Pairwise Granger Causality Test

Table 5. Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
UNEMP does not Granger Cause RGDP	31	2.59983	0.0755
RGDP does not Granger Cause UNEMP		8.10690	0.0007
PCE does not Granger Cause RGDP	31	0.47560	0.7022
RGDP does not Granger Cause PCE		2.51039	0.0828
PCE does not Granger Cause UNEMP	31	6.77639	0.0018
UNEMP does not Granger Cause PCE		0.85684	0.4768

Source: Researcher's compilation from E-view 7

From table 5 above, the results of the Granger causality test revealed unidirectional relationship between unemployment (UNEMP) and real gross domestic product (RGDP) with causality running from RGDP to UNEMP in the economy. Furthermore, the results also showed that private consumption expenditure (PCE) does not have any significant causal relationship with RGDP in Nigeria. This is evidenced by the P-values of the variables as shown in the estimation results of the Granger causality test. In the results, the F-statistic value of the causality that runs from UNEMP to RGDP is 2.59983, and its associated p-value is 0.0755; whereas the F-statistic value of the causality that runs from RGDP to UNEMP is 8.10690, and the associated p-value is 0.0007. From the above facts, it is therefore observed that the p-value of the causality that runs from RGDP to UNEMP is statistically significant. This implies that it is RGDP that leads to unemployment in Nigeria. Increase or decrease in unemployment level in the economy depends largely on real gross domestic product (RGDP).

5. Conclusion

The main purpose of this study is to examine the relationship between unemployment and economic growth in Nigeria; specifically, it focuses on the impact of unemployment on economic growth for the period 1980-2013. Cointegration test and its associated vector error correction model (VECM) and Granger causality test were used in the analysis. The variables such as real gross domestic product (RGDP) used as common proxy for economic growth, unemployment rate (UNEMP) and private consumption expenditure (PCE) were employed in the investigation. Stationarity test was conducted through the application of the Augmented Dickey - Fuller (ADF) test, and the results indicated that all the variables except UNEMP were stationary at level, while the UNEMP became stationary after first differencing. Furthermore, the result of the Johansen cointegration test revealed that significant long run relationship exists among RGDP, UNEMP and PCE. Similarly, the result of the Vector Error Correction Model (VECM) showed that unemployment (UNEMP) has negative and significant impact on real gross domestic product (RGDP). Finally, the result of the Granger causality test indicated unidirectional relationship between UNEMP and RGDP with causality running from RGDP to UNEMP. Based on these findings, the study therefore recommends that government should as a matter of urgency create more employment opportunities in order to absorb the teeming population of the unemployed work force in the country through modernization of the agricultural sector, bring in modern equipment in the facilities of agriculture to make the sector more attractive to all citizens despite one's qualifications and profession. More so, the study recommends that government should apply its appropriate legislative functions to discourage gender discrimination in the labour market in order to encourage females to participate actively in the labour market. Similarly, economic diversification policies should be pursued by government as a way of creating employment opportunities and promoting economic growth of the country.

References

- Ahmed, R. C. & Ambreen, A. (2014), "Economic Determinants of Unemployment in Pakistan: Cointegration Analysis", *International journal of business and social science* 5(3), 209- 221.
- Akintoye, I. R. (2003), "Reducing Unemployment through the Informal Sector: A case Study of Nigeria", *European Journal of Economics, Finance and Administrative Sciences*, 1450-2275.
- Amassoma, D. & Nwosa, P. I. (2013), "The Impact of Unemployment rate on Productivity Growth in Nigeria: An Error Correction Modeling approach", *International Journal of Economics and Management Sciences* 2 (8), 1-13.
- Aminu, U., Manu, D. & Salihu, M. (2013), "An Empirical Investigation into the Effect of Unemployment and Inflation on Economic Growth in Nigeria. *Interdisciplinary Journal of Research in Business* 2 (12), 1-14.
- Asoluka, N. & Okezie, A. (2011), "Unemployment and Nigerian Economic Growth (1985-2009)", *International Association for Teaching and Learning*, 1-11.
- Central Bank Nigeria (2012), Statistical Bulletin Annual Report
- Dickey, D. A. & Fuller, W. A. (1981), "Likelihood Ratio Statistics for Autoregressive Time Series with a Unit Root", *Econometrica* 49, 1057-1072.
- Ejikeme, J. N. (2014), "Unemployment and Poverty in Nigeria: A Link to National Insecurity", *Global Journal of Politics and Law Research* 2(1), 19-35.
- Freeman, D. G. (2007) , " Panel Tests of Okun's Law for Ten Industrial Countries", *Economic Inquiry* 39 (4), 511-523.
- Harrod, R. & Domar, E. (1957), *Theory of economic growth. Oxford University Press.* Chapt.3,4.
- Haruna, M. A., Saifullahi, S. I. & Mukhtar, S. (2013), "An Empirical Investigation into the Relationship between Financial Sector Development and Unemployment in Nigeria", *Asian Economic and Financial Review* 3(10), 1361-1370.
- Hussain, T., Siddiqi, M. W. & Iqbal, A. (2010), "A Coherent Relationship between Economic Growth And Unemployment: An Empirical Evidence from Pakistan", *International Journal of Human and Social Science*, 5, 5-13.
- International Labour Organisation (2012), "Global Employment Trends for Youth 2012", Retrieved on 12/07/2013 <http://www.ilo.org/wcmsp5/groups/public/...dgreports/---dcomm/documents/publication/wcms-180976.pdf>
- Johansen, S. & Juselius, K. (1990), "Maximum Likelihood Estimation and Inference on Co-integration with Applications to the Demand for Money", *Oxford Bulletin of Economics and Statistics* 52(2), 169-210.
- Kareem, R. O. (2015), "Employment Level and Economic Growth of Nigeria", *Journal of Sustainable Development Studies* 8 (1), 53-70.
- Kayode, A., Samuel, A. & Silas, F. A. (2014), "The Rising Rate of Unemployment in Nigeria: The Socio-Economic and Political Implications", *Global Business and Economics Research Journal* 3 (2), 12 – 32.
- Kemi, F. A. & Dayo, B. O. (2014), "Unemployment and Economic Growth in Nigeria", *Journal of Economics*

- and Sustainable Development* 5(4), 138-144.
- Mercy, A. O. & Christie, O. O. (2014), "Poverty Reduction Policy and Youth Unemployment in Nigeria", *Public Policy and Administration Research* 3(4), 92- 103.
- Mustafa, K. (2011), "An Analysis of the Relationship between Foreign Trade and Economic Growth in Turkey over the period (1980-2009)", *Master Thesis*, Lund University, School of Economics and Management, 20-35.
- Nwankwo, C. A. (2014), "Impact of Unemployment on Nigerian Economic Development: A Study of selected Local Government Area in Anambra State, Nigeria", *European Journal of Business and Management* 6 (35), 103-112.
- Obadan, M. I. & Odusola, A. F. (2010), "Productivity and Unemployment in Nigeria", *CBN Occasional Paper*, 16-19.
- Odusola, A. F. (2001), "Nigeria's Unemployment Problem in the 1980s and 1990s: Implication for Policy Directions in the 21st Century", *NCEMA Policy Seminal Series*. Ibadan, Nigeria, 34-43.
- Ohajianya, D. O. (2012), "Discriminant analysis of Rural Households Unemployment Status in Imo State, Nigeria", *Greener Journal of Social Sciences* 2(6), 230-236.
- Oluoyomi, A. & Ogunrinola, O. I. (2011), "Employment and economic growth nexus in Nigeria", *International Journal of Business and Social Sciences* 2(11), 12-17
- Okun, A. M. (1962)., "Potential GNP: Its Measurement and Significance. Proceedings of the Business and Economics Section of the American Statistical Association, Washington, DC", *American Statistical Association*., 98-104.
- Oye, N. D., Inuwa, I. & Muhammad, S. A. (2011), "Unemployment in Nigeria: Implication on the Gross Domestic Product (GDP) over the Years", *International Journal of Economics* 2(1), 66-71.
- Phelps, E. S. (1961), "The Golden Rule of Accumulation: A Fable for Growthman", *American Economic Review* 51, 53-91.
- Philip, I. N. (2014), "Government Expenditure, Unemployment and Poverty rates in Nigeria", *JORIND* 12 (1), 77– 84.
- Solow, R. M. (1956), "Contribution to the Theory of Economic Growth", *QJE* , 65-94.
- Swane, A. & Vistrand, H. (2006), "Jobless Growth in Sweden? A Descriptive Study", Being a *Master's Thesis in International Economics and Business at Stockholm School of Economics*, 39-42.
- Zaglar, M. (2006), "Does Economic Growth Exhibit a Different Impact on Job Creation and Job Destruction"? *Scottish Journal of Political Economy* 53, 672-683.
- Zaleha, M. N., Norashidah, M. N. & Judhiana, A. G. (2007), "The Relationship between Output and Unemployment in Malaysia: Does Okun's Law exist"? *International Journal of Economics and Management* 1(3), 337 – 344.

AUTHORS BIOGRAPHY

1. Eze, Onyebuchi Michael is a lecturer in the Department of Economics, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria. He was born on 22nd October, 1987 at Ebony State, Nigeria. Eze Onyebuchi Michael obtained his B.Sc (honours) with second class lower division in 2010 and an M.Sc degree both in economics from Ebonyi State University, Abakaliki, Ebonyi State, Nigeria in 2016. Currently, he is running his Ph.D programme at Ebonyi State University, Abakaliki, Nigeria. His area of specialization is *microeconomics and mathematical economics*.
2. Atuma, Emeka is a lecturer in the Department of Economics, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria. He was born on 5th October, 1984 at Ebony State, Nigeria. Atuma Emeka studied in Ebonyi State University, Abakaliki where he obtained his B.Sc (honours) with second class lower division in 2010 and an M.Sc degree both in economics in 2009. Currently, he is running his Ph.D programme at Ebonyi State University, Abakaliki, Nigeria. His area of specialization is *mathematical economics and Econometrics*
3. Egbeoma Nwigboji Emmanuel is a lecturer in the Department of Economics, Ebonyi State University, Abakaliki, Nigeria. He was born on 15th October, 1972 at Ebonyi State, Nigeria. He obtained his B.Sc (honours) with second class lower division from Ebonyi State University, Abakaliki in 2005 and an M.Sc degree from the same university in 2016. Nwigboji, Emmanuel is currently running his Ph.D programme at Ebonyi State University, Abakaliki. His area of interest in journal article is *development economics*