Exchange Rate and Unemployment in Nigeria: An Analysis

Emmanuel C. Ani[1*] Emmanuel Joel[2] and Mamman Andekujwo Baajon[3]

[1]Department of Economics Faculty of Humanities, Management & Social Sciences, Federal University, Wukari, Taraba State, Nigeria

[2]Department of Economics Faculty of Humanities, Management & Social Sciences, Federal University, Wukari, Taraba State, Nigeria

[3]Department of Economics Faculty of Humanities, Management & Social Sciences, Federal University, Wukari, Taraba State, Nigeria

Abstract

One of the serious challenges to Nigeria today is Unemployment. There have been many studies to investigate variables which affect unemployment in macroeconomics. Considering exchange rate volatility in recent years which has affected most of major variables of Nigerian economy, this paper investigated the relationship between Exchange rate and Unemployment in Nigeria using annual data of Thirty-one Years (1986 to 2017). In order to achieve the objective of the paper, Autoregressive Model with distributed Lag was used to find out the relationship between Real Exchange rate and Unemployment in the country. The Variables used are Unemployment rate, Real Exchange rate, Real Gross Domestic Product (RGDP), Export Value index; and Import Value index. It was found that Real Exchange Rate has positive effect on unemployment during the period. With high exchange rate, unemployment rate increases. The paper advises for efforts to increase supply of foreign exchange earnings in the country so as to curtail excess demand for it. This will lead to producing more goods as industries that would be established for such production will absorb more workforces out of the unemployed.

Key Words: Unemployment; Exchange rate; Auto- regression;

Introduction

Currently in Nigeria, there is a growing interest in the relationship between real exchange rate, unemployment and economic growth. Today, unemployment has become a very serious challenge to Nigerian Authority and Nigerians as a whole. The problems due to unemployment are tangible in Nigeria because the country has young population, otherwise known as the Youth. It should be noted that in Nigeria the main part of revenue to the government is from foreign exchange earnings through exporting mineral materials. Exchange rate thus constitutes an invaluable variable in the economy as a whole.

Looking at it from another perspective, exchange rate volatility causes widespread changes in the economy of the country. Though exchange rate volatility is needed for stability in macroeconomics in the long run, instability of exchange rate is said to have negative effects on an economy in the short run. Hence, as a kind of risk factor, exchange rate volatility need to be studied more carefully and closely as these fluctuations can lead to risk-averse investors that have less investment, and consequently result to a reduction in the employment rate [De Grauwe, 1988].

Labour market is interrelated to other economic markets and because of this; it is seen as an important market in the economy Azvaji and Asgari, [1]. In Nigeria, labour market has been faced with the increase of unemployment due to among other reasons, high growth of population. Thus labour supply has exceeded labour demand. This excess is geometrically increasing and has caused unemployment and lack of suitable job for the workforce, especially the young people and University graduates. This can be shown in figure 1.1 below figure 1.
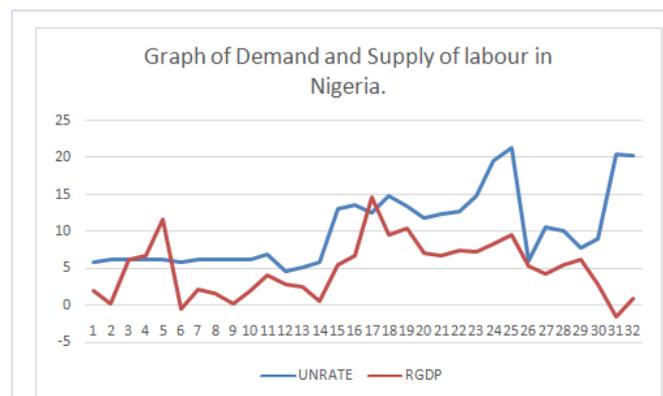

Figure 1: Author's Computation using Excel 2016 Version, 2019.

From the graph above, the vertical axis represents percentage (%) while horizontal axis indicated number of years from 1986-2017. In addition, Unemployment rate (UNRate) and Real Gross Domestic Product (RGDP) were proxies for supply and demand of labour in Nigeria respectively.

Employment of workforce is a crucial matter which involves many factors. Apart from the fact that labour supply is related to some variables like population growth, population and age distribution, emigration as well as women's participation rate,

labour demand is concerned with a number of variables such as volume of investment, distribution of investment, technology, productivity and economic growth.

Exchange rate has been of great value and sensitive in an economy. The sensitiveness of exchange rate increases when it is determined incorrectly Frenkel, [8]. Thus, the policy of determining exchange rate is a crucial matter and in such determination, any type of mistake has to be avoided.

Export in an economy is traditionally based on the level of domestic prices, exchange rate and production. Changes in exchange rate may cause changes in the amount of export and import due to the amount of production. If the increase of exchange rate increases the price of imports, the amount of imports will decrease and domestic products will replace imports and in turn, this will increase employment [Ghaavi, 2002]. Such development will lead to development of industries and expand factories to employ more workforces.

However, the decrease of the price of exports can attract foreign market and thus increase the competitive ability of the country thereby increasing the amount of export. This increases the amount of demand in the country, which, with the stability of other conditions and attraction of supply, leads to the increase of domestic production.

The increase of exports results in the increase of production and this increases the demand for workforce and as a consequence, has positive effects on employment.

Some other factors like labour productivity, gross domestic product, and the real exchange rate have some positive or negative effects on unemployment. Therefore, it can be hypothesised that increase or decrease of exchange rate has some effects on unemployment. This was the situation in Nigeria between 1986 and 2017 which motivated the writing of this paper. In other words, the paper indicated the effect of real exchange rate in Nigerian unemployment rate between 1986 and 20187. Following this introduction are Literature Review, Methodology, Presentation of Result, Conclusion and Recommendation.

Literature Review

There abound controversies about the relationship between exchange rate and unemployment in economic literature. While some studies tried to find out if there is any relationship between them at all, others with the belief there are, targeted to fathom the nature of such relationship. Many works have been studied in these regard.

Nyahokwe and Ncwadi, [13], Shaari, Hussain and Abdul Rahim (2013), Chang, [3], Mohammadi and Gholami (2008), Frenkel and Ros, [8], Milas and Legrenzi, [12], Djivre and Ribon, [6] were interested in knowing whether there were any relationship between exchange rate and unemployment. All but Mohammadi and Gholami (2008) attested to the existence of such relationship.

For instance, Nyahokwe and Ncwadi (2013) did work on the impact of real exchange rate volatility on unemployment in South Africa. The finding was that among other determinants, real

exchange rate accounted for the largest proportion of the variation in unemployment rate hence, they concluded that unemployment rate fluctuations were primarily equilibrium responses to real exchange rate shocks when compared with interest rates, economic growth and exports. Shaari et al. (2013) examined the effect of oil price and exchange rate on unemployment in Malaysia and the result was that there existed long run relationship between exchange rate, oil price and unemployment. The investigation to find short run relationship showed that short run relationships were influenced by the estimated long run equilibrium and that oil price did not affect unemployment but exchange rate had an influence on unemployment. According to them, putting the exchange rate under control had to be carried out in order to control unemployment.

Chang [3] was interested in knowing the relationship between exchange rate uncertainty and unemployment in South Korea and Taiwan. He discovered that a long run equilibrium relationship existed between exchange rate uncertainty and unemployment in both Taiwan and South Korea as exchange rate uncertainty was generated by two different measures. Their findings also stated that exchange rate uncertainty had a short run effect on unemployment and vice versa, irrespective of the measure of uncertainty employed or used.

Frenkel and Ros [8] examined the role of exchange rate in the unemployment performance of Latin American countries including Argentina, Brazil, Chile, Chile and Mexico and the empirical evidence from their work stated that the hypothesis of an important influence of the real exchange rate o unemployment was not unacceptable. Similarly Milas and Legrenzi [12] employed UK data from 1973 to 2004 to confirm that the dynamics of the real exchange rate, real wages, and unemployment varied both with large versus small real exchange rate disequilibria and rising versus falling unemployment regimes. In their finding, unemployment reduced due to earnings in competitiveness as the real exchange rate was further away from equilibrium.

On the contrary to these researchers' findings, Mohammadi and Gholami (2008) in their work on Iranian economy found that official exchange rate had no significant relationship with unemployment and real gross domestic product.

Haven looked at the works that were interested whether there was relationship between exchange rate and unemployment; as earlier stated, some other literature are concerned as to know the essence to which there existed such relationship between them, this we now turn to.

Lindblad and Sellin, [11], Zhou (2010), Feldman, [7] and Chimanani , Bhutto, Butt, Sheikh, and Devi, [4] reported positive relationship between exchange rate and unemployment while Frenkel, [9], Ranjbar and Moazen (2009), Behoamian, [2] and He (2013) opined negative relationship between exchange rate and unemployment.

Lindblad and Sellin, [11] evaluated a structural unobserved components open economy model for the unemployment rate and real exchange rate. They simultaneously determined changes

in both cyclical and equilibrium rates in the two variables. The results showed that the considerable changes in the Swedish unemployment rate during the 1990s were mainly a cyclical matter. The development of the exchange rate was mainly driven by terms of trade and government deficits. Hence, the development of the Swedish unemployment rate was successfully explained by the depreciation of the real exchange rate, a higher replacement ratio, and higher taxes.

Feldman, [7] made use of the data on 17 industrial countries from 1982 to 2003 and controlled for a wide array of factors to get only the effect of exchange rate volatility on unemployment. The result showed that higher exchange rate volatility increased unemployment rate but the magnitude of the effect was small. Chimanani et al. [4] investigated the effect of exchange rate on unemployment rate in ten Asian countries from the period of 1995 t0 2005. The result indicated that exchange rate volatility had positive and significant effect on unemployment rate in Asian countries.

Zhou (2010) analysed a simple theoretical relationship between exchange rate and unemployment and concluded that the impact of exchange rate was unconditional in that home currency depreciation spurred employment and alleviated the unemployment situation.

Conversely, Frenkel, [9] examined the mechanisms by which real exchange rate affected the employment performance. These include macroeconomic channel, development channel, and labour intensity channel. The macroeconomic channel is about the role of real exchange rate in determining the activity and employment levels in the short run. The development channel is about the influence of real exchange rate on economic growth and hence, on the speed of generating new jobs while the labour intensity channel is about the role of real exchange rate in affecting the labour intensity of the economic process- implying the influence of real exchange rate on the employment generation ability of a given activity level or rate of output growth. Thus, all these factors had positive effects on employment and consequently, they had negative effect on unemployment.

Ranjibar and Moazen (2009) examined the factors which affect unemployment in eight countries of the Organisation of Islamic Countries (OIC) using the data of 7 years from 1999 to 2006. They found that unemployment had an indirect and negative relationship with gross domestic product, industrial export, and real exchange rate and that it had a direct and positive relationship with the size of workforce.

Behanamian, [2] investigated the long run relationship between real exchange rate and unemployment in Iran between 1962 and 2010 and concluded that real exchange rate had negative effect on employment during the period. Finally, He (2013) investigated the relationship between unemployment rate and real effective exchange rate in several countries from 1994 to 2009. The result showed that most of the countries demonstrated a negative relationship between those two factors, meaning that increase of exchange rate could improve employment rate in an economy.

This paper therefore examined in the case of Nigeria between 1999 and 2017 whether the relationship between real exchange rate and unemployment was positive or negative after which policy measures would be postulated.

Methodology and Data

In the paper the annual time series data relating to exchange rate and unemployment rate from 1986 to 2017 was used. The sources of the data include Central Bank of Nigeria Statistical Bulletin (2017), and World Development Indicators (2017), International Labour Organisation (ILO) Estimate,(2018). The data were gathered and analysed to find out the kind of relationship between the two variables. For the purpose of achieving the objective of the paper, Pesaran et al. (2006) model was used to estimate the effect of exchange rate on unemployment. Consequently, equation from Pesaran et al (2006) model for the relationship between exchange rate and unemployment rate as specified below were obtained and utilized:

The Model Specification

The model for this analysis would be specified thus:

The functional model as:

Unrate= f (EXR, RGDP, EXV, IMV)..eqn (1)

The equation (1) would be transformed into the logarithmic form as:

$InUNRatet = \beta_0 + \beta_1 InU_{t-1} + \beta_2 InEXR_{t-1} + \beta_3 InRGDP_{t-1} + \beta_4 InEXV_{t-1} + \beta_5 InIMV_{t-1} + \mu t$...eqn (2)

Where:

UNRate = Unemployment Rate

EXR = Real Exchange Rate

GDP = gross domestic product

EXV= Export Value Index

IMV= Import Value Index

µt = Stochastic Error term

The hypothesis for the test is as follows:

Ho: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ (No long run relationship i.e No Co-integration)

H1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ (there is long run relationship – Co-integration exist).

Empirical Analysis

In this paper the dependent variable is the Unemployment rate while the independent variables are the Real Exchange rate, the country's GDP, Export, and Import from 1986 to 2017. In order to test for the long run and short run relationships in the paper, application is made of Co-integration test. The reason is that the technique serves efficiently for the evaluation of the long run relationship between unemployment and its explanatory variables and before testing for Co-integration, Unit root test was first conducted.

Unit Root Test

The purpose of conducting the Unit Root test is to ascertain whether the variables of interest are stationary or otherwise. If there are unit root, the conclusion is that the data are not stationary whereas the absence of it confirms the data is devoid of non-stationary, implying it is stationary table 6.1.

From table 4.1 above, it can be seen that the unit root in the paper is all stationary across the variables at first difference 1(1) and except IMV is stationary at level. Haven made sure of the stationary status of the variables, the next step is to investigate the Co-integration nature of the variables table 6.2 and table 6.3.

Table 6.1: Unit Root Test

Variables	ADF Test Statistical value	Mackinon Critical value	p-value	Order of Integration	Remark
UNRATE	-6.45005	-2.963972	0	I(1)	Stationary
RGDP	-7.481399	-2.963972	0	I(1)	Stationary
EXR	-4.739587	-2.963972	0.0007	I(1)	Stationary
EXV	-4.156182	-2.963972	0.0030	I(1)	Stationary
IMV	-5.734407	-2.963972	0.0000	I(0)	Stationary

Source: Authors' Computation Using: Eview Version 10, 2019

Table 6.2: Co- integration test result

Date: 03/04/19   Time: 15:07

Sample (adjusted): 1988 2017

Included observations: 30 after adjustments

Trend assumption: Linear deterministic trend

Series: UNRATE RGDP EXR EXV IMV

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Eigenvalue	Trace Statistics	0.05 Critical Value	Prob.**
None *	0.705396	79.63917	69.81889	0.0067
At most 1	0.482605	42.97546	47.85613	0.1332
At most 2	0.361208	23.20698	29.79707	0.2360
At most 3	0.197834	9.761710	15.49471	0.2995
At most 4	0.099631	3.148509	3.841466	0.0760

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.705396	36.66371	33.87687	0.0226
At most 1	0.482605	19.76848	27.58434	0.3574
At most 2	0.361208	13.44527	21.13162	0.4121
At most 3	0.197834	6.613201	14.26460	0.5358
At most 4	0.099631	3.148509	3.841466	0.0760

Max-eigen value test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 6.3: Pairwise Granger Causality Tests
Date: 03/04/19   Time: 15:11
Sample: 1986 2017
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
RGDP does not Granger Cause UNRATE UNRATE does not Granger Cause RGDP	30 0.81380	0.34823 0.4546	0.7093
EXR does not Granger Cause UNRATE UNRATE does not Granger Cause EXR	30 2.54260	5.82096 0.0988	0.0084
EXV does not Granger Cause UNRATE UNRATE does not Granger Cause EXV	30 7.42597	1.84794 0.0029	0.1784
IMV does not Granger Cause UNRATE UNRATE does not Granger Cause IMV	30 7.521126	7.25834 0.0028	0.0033
EXR does not Granger Cause RGDP RGDP does not Granger Cnause EXR	30 0.41847	0.00204 0.6626	0.998
EXV does not Granger Cause RGDP RGDP does not Granger Cause EXV	30 1.61686	0.84840 0.2186	0.4401
IMV does not Granger Cause RGDP RGDP does not Granger Cause IMV	30 1.79164	0.57823 0.1874	0.5682
EXV does not Granger Cause EXR EXR does not Granger Cause EXV	30 4.85790	1.62902 0.0165	0.2163
IMV does not Granger Cause EXR EXR does not Granger Cause IMV	30 9.15071	2.01485 0.0010	0.1544
IMV does not Granger Cause EXV EXVdoes not Granger Cause IMV	30 7.45216	2.84812 0.0029	0.0769

Source: Authors' Computation Using: Eview Version 10, 2019.

In table 4.2(a) above it can be seen that at least there is one Co-integration equation in Trace Statistic test at the 00.05 level of significant and a confirmation of Max-Eigen value at that level as shown in table 4.2 b. With this therefore, the paper posits that there was a long run relationship or equilibrium among the variables in Nigerian economy between 1986 and 2017.

Source: Authors' Computation Using: Eview Version 10, 2019.

The next for consideration is the pair wise Granger Causality Tests in table 4.3.

Here there is indication that causal relationship exists among the variables in the paper. For instance, it is shown that unidirectional effect of real exchange rate and unemployment rate existed in Nigerian economy with the significant probability value of 0.0084. The economic implication is that during the period under investigation, the higher is the exchange rate, the higher is the rate of unemployment rate in the country. While export value index does not Ganger cause unemployment in Nigerian economy, unemployment reduces the value of export value index as indicated by the p-value of 0.0029. It is also noted that high import value index led to high rate of unemployment and unemployment on the other hand, attracted high rate of import value index into the country as shown by the p-value of 0.0033 and 0.0028 respectively.

High import value index does not Granger cause high exchange rate but high exchange rate Granger cause low import value index at p-value of 0.0010 and finally, high export value index Granger cause high import value in the country at p-value of 0.0029 during the period table 6.4.

Table 6.4: ARDL Result
Dependent Variable: UNRATE
Method: ARDL
Date: 03/04/19 **Time:** 15:05
Sample (adjusted): 1990 2017
Included observations: 28 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): RGDP EXR EXV IMV
Fixed regressors: C
Number of models evaluated: 2500
Selected Model: ARDL(2, 1, 1, 3, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
UNRATE(-1)	-0.06502	0.1758	-0.36984	0.7179
UNRATE(-2)	-0.22422	0.139741	-1.60455	0.1346
RGDP	0.183962	0.108102	1.701745	0.1145
RGDP(-1)	0.22831	0.11996	1.90322	0.0813
EXR	0.012536	0.016578	0.756168	0.4641

EXR(-1)	0.065185	0.018808	3.465846	0.0047
EXV	-0.03937	0.01287	-3.05855	0.0099
EXV(-1)	0.000788	0.014138	0.05574	0.9565
EXV(-2)	-0.06185	0.01473	-4.19886	0.0012
EXV(-3)	0.022147	0.016303	1.358496	0.1993
IMV	0.040162	0.013064	3.074224	0.0096
IMV(-1)	0.037449	0.011731	3.192205	0.0077
IMV(-2)	0.01482	0.012076	1.227222	0.2433
IMV(-3)	-0.03011	0.010819	-2.78329	0.0165
IMV(-4)	-0.01948	0.007611	-2.55932	0.025
C	5.622149	0.930931	6.039278	0.0001

R-squared	0.970486	Mean dependent var	10.86858
Adjusted R-squared	0.933593	S.D. dependent var	5.156178
S.E. of regression	1.328724	Akaike info criterion	3.701875
Sum squared resid	21.1861	Schwarz criterion	4.463135
Log likelihood	-35.8263	Hannan-Quinn criter.	3.934599
F-statistic	26.30558	Durbin-Watson stat	2.065777
Prob(F-statistic)	0.000001		

Note: p-values and any subsequent tests do not account for model selection.
Source: Authors' Computation Using: Eview Version 10, 2019

The analysis of ARDL Results in table 4.4 above is as follows.

There is a statistically significant positive relationship between real gross domestic product and unemployment rate in the short run. The same is applicable to exchange rate and export value index while there is negative relationship between import value index and unemployment in the short run during the period.

Discussion and Conclusion

Exchange rate is an invaluable variable that affects unemployment in Nigeria. Real exchange rate volatility leads to the fluctuations of the real value of domestic currency which causes changes in the level of product and employment. The results of the stationary of the variables as well as co-integration, and pair wise Granger Causality Test nature of the variables; the autoregressive distributed lag were used to assess the relationship between the variables.

The results of the paper were analysed. Short run results showed that there was a positive and significant relationship between real gross domestic product and unemployment; positive relationship between exchange rate and unemployment, same with export value index and unemployment but a negative relationship between import value index and unemployment in Nigeria during the period under investigation. The constant shows that other factors apart exchange effect unemployment significantly at 5% level with the probability of 0.0001.

On the basis of the results of Co-integration and Pair wise Casualty Tests the null hypothesis of lack of long run relationship is rejected in favour of the alternative hypothesis and it could be stated that there was a significant long run correlation between the variables of the paper.

The positive effect of exchange rate on unemployment is in agreement with the findings of Lindblad and Sellin, [11], Feldmann, [7], Chimnani et al, [4] and Zhou (2010) who posited that exchange rate had positive effect on unemployment rate.

Other works that were of same view about the relationship between exchange rate and unemployment as this paper includes Chang, [3] and Nyahokwe and Ncwadi's [13].

The coefficient of real gross domestic product had a direct relationship with unemployment in Nigeria. So also the export value index but that of import value index was the other way round.

Conclusion

So many factors cause unemployment in Nigeria. This paper investigated four factors which include exchange rate volatility, real gross domestic product, export value index; and import value index. The results from the examination show that in both short- and long runs exchange rate volatility, real gross domestic product, export value index had positive and significant effect on unemployment but import value index had negative relationship on unemployment in the short run. It is the advice of the paper that exchange rate policy to increase the supply of foreign exchange into the country should be vigorously pursued. Currently the demand for foreign exchange is higher than the supply and as exchange rate is high, unemployment is high. However, with

high supply of exchange rate, industries could be established to produce more goods and, by so doing leads to employment of the teaming employable labour force roaming about in the country.

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