



SELECTED EXTERNAL SECTOR VARIABLES AND UNEMPLOYMENT IN NIGERIA

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Abstract: The study examined selected external sector variables and unemployment in Nigeria from 1980 to 2021. The objectives of the study were to: determine the impact of foreign exchange reserves and trade openness on unemployment rates in Nigeria. Annual data was collected from CBN statistical bulletins and World Development Index (WDI) and the techniques of Augmented Dickey Fuller (ADF) unit root test and Autoregressive Distributed Lag (ARDL) model was used. The ADF results showed that, only trade openness was integrated at order zero, $I(0)$, while the remaining two variables were integrated at order one, $I(1)$. The ARDL results showed that, there is a long-run relationship amongst the variables. Also, in the short-run, there is a negative relationship between foreign exchange reserves and unemployment in Nigeria. But, trade openness has positive relationship with unemployment rate in Nigeria. Nevertheless, trade openness impacted on unemployment rate. Given these findings, it was concluded that, foreign exchange reserves, and trade openness jointly impacted on unemployment rate in Nigeria. Based on the results, the following recommendations amongst others were suggested: Foreign exchange reserves should be well utilized with a view to increasing the rate of employment. Government should also encourage local production that will help to improve trade openness through increase in exports, which will in turn help to reduce unemployment rate.

Keywords: ARDL, External reserves, foreign exchange, Trade openness and Unemployment

1. INTRODUCTION

The working of the external sector is important to the development process of a country. This is because the external sector is a network of economic transactions a country has with other countries. An ideal external sector is one that is stable and in equilibrium over time, for this situation ensures sustainable economic development through reduction in unemployment rate of a country. The major indicators of external sector performance are exchange rate, foreign exchange earnings and external debt. Exports, imports and trade openness as an indicator of external sector arises from trade interactions between one country and others. This trade not only includes goods and services but also trade in financial assets (Tajudeen, 2012).

According to Obadan and Okojie (2010), without tapping into the world market through external sector via trade, Nigeria's relatively large domestic market may support growth but cannot on its own ensure sustainable growth at the rates needed to make visible impact on development to the country. Therefore, Nigeria has continued to rely on foreign markets.

Meanwhile, the fact that the external sector of an economy reflects the relative strength of an economy, had prompted some economists and policy makers to advocate for adoption of import-substitution and export-led policies or models to grow economies. The import-substitution model encourages domestic production and development through the use of various protectionist policies, while export-led growth model aims at encouraging and supporting exports

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to generate sufficient foreign exchange. Advocates of import-substitution believe that “the benefits from increasing production output with the attendant increase in rate of domestic employment would compensate for losses that may arise from ineffective resource distribution associated with their model”. On the other hand, advocates of export-led growth believe that “foreign trade drives economic growth, because it facilitates more effective distribution of resources within a single country and between different countries and regions”. Thus, the proponents of the export-led growth model affirm that there is a direct link between growth in exports and aggregate demand.

From the above discussion, it seems that the performance of the external sector of Nigeria affects the economic development of the country. For instance, unemployment increased from 23.9 per cent in 2011 to 25 per cent in 2014, 26.1 per cent in 2016 (NBS, 2017). Also, the incidence of poverty rose from 42.7 per cent in 1972 to 65.6 per cent in 1996 with an all-time high value of 69 per cent in 2010 (Kakain & Obayori, 2018). What these suggest is that the performance of external sector variables in terms of revenue and rents could not improve the economic development in terms better employment, poverty reduction or attaining any of the Millennium Development Goals (UNDP, 2018).

In view of the problem emanating from external sector variables, there is the need to appeal to empirical evidence to examine the contribution of selected external sector variables to reduction in unemployment rate in Nigeria. Thus, the objectives of the study are to; determine the impact of foreign exchange reserves on unemployment rate; and examine the impact of trade openness on unemployment in Nigeria from 1980 to 2021. The remaining parts of the study examined, the Nigerian external sector variables, theoretical and empirical literature, methodology, results and discussion as well as conclusion and recommendations.

2. THE NIGERIAN EXTERNAL SECTOR VARIABLES

Nigeria’s external sector had remained unchanged since the 1970’s with the sector dominated by crude oil exports. Prior to the 1970’s, the major non-oil exports were palm-oil, rubber, timber, cocoa, tin and columbite and groundnut (CBN, 1970). By the mid-1970s, crude oil exports had dominated the Nigerian export sector owing to the increase in oil price in the international crude oil market. Similarly, the import structure of the Nigerian external sector had not shown any significant shift over the years, as capital goods and raw materials remained the bulk of total imports.

2.1 The Import Structure of the Nigerian Economy

Importing refers to buying of goods and services from foreign sources and bringing them back into the home country. Since independence, the imports structure of the Nigerian economy had been characterized by high non-oil imports owing to domestic demand for foreign goods and services. The imports bill, at US\$604 million in 1960, continued to grow and by 1977 the imports bill stood at US\$10.9 billion. There had not been any significant structural shifts in the composition of imports since 1970 as the relative share of raw materials, capital and consumer goods in total imports remained unchanged. The categories of imports were, however, determined by prevailing domestic policies, exchange rate movements, consumer’s reference for imported manufactures and increased domestic production gap. From 1985 to 1994 imports bills reduced drastically in line with Structural Adjustment Policy (SAP) measures taken. During 1992-1998, raw materials became dominant in the import basket due to improved incentives to the manufacturing sub-sector to shore up the level of capacity utilization (CBN, 2000). The upward trend in imports between 1995 and 1998 was attributable largely to the appreciation of the exchange rate of the naira vis-à-vis the US dollar. Other reasons include increased tempo in economic activities, especially the deregulation of the communication and downstream oil



sectors as well as intense efforts by the government to rehabilitate infrastructure and boost the domestic capacity of the real sector.

Prior to the Structural Adjustment Programme (SAP) in 1986, policies were relaxed to accommodate imports of essential commodities with some restrictive measures from 1982 when foreign exchange reserves drastically declined to US\$1.1 billion less than a month of import cover. The share of oil sector imports which averaged 3.1 per cent between 1970 and 1985 had increased to 16.7 per cent since SAP. Import bills, which averaged US\$5.9 billion between 1986 and 1998, rose significantly on an average of US\$31.8 billion between 2000 and 2011. In addition, oil sector imports also increased from an average of US\$1.3 billion between 1986 and 1998, to an average of US\$8.1 billion between 2000 and 2011.

2.2 Concept of Exports/Exports Structure of the Nigerian Economy

Export is an activity in international trade whereby goods produced in one country are shipped to another country for future sale or trade. The sales of such goods add to the producing nation's gross output. Nigeria major exports in the 1960s were agricultural produce accounting for over 80.0 per cent of total exports.

The proportion of non-oil exports remained dominant in the 1960s until 1970s when crude oil exports increased remarkably to become the dominant export commodity. By 1974 crude oil exports stood at 90.0 per cent of total exports; and further increased to 96.0 per cent in 1980 - 1986. Conversely, the share of non-oil exports in total export declined from an average of 7.0 per cent from 1970 -1985 to 4.0 per cent between 1970 and 1986, but dropped further to 3.1 per cent from 2007-2011 (CBN, 2011).

The non-oil exports performance remained largely unimpressive, even though, and by category, it expanded to include non-traditional commodities. Furthermore, the international demand for non-oil products remained low owing, largely, to the development of synthetic

alternatives, discriminatory tariffs and the new entrants into the international commodity market. Manufactured (value-added) exports have remained low implying that there had been no significant shift from the primary to the industrial productions.

According to Ekpo and Egwaikhide (1994) agricultural export commodities contributed well over 75% of total annual merchandise exports in 1960. Nigeria also ranked very high in the production and exportation of some major crops in the world in the 1940s and 1950s. For instance, Nigeria was the largest exporter of palm oil and palm kernel, ranked second only to Ghana in Cocoa, and occupied third position in groundnut. Nigeria's export earnings from major agricultural crops contributed significantly to the Gross Domestic Product (GDP) then. Meanwhile, Nigeria's major exports in the 1960s were agricultural produce accounting for over 80% on average. The proportions of non-oil exports remained dominant in the 1960s until 1970s before crude oil exports increased remarkably to become the dominant export commodity. By 1974 crude oil exports stood at 90.0 per cent of total exports; and further increased to 96.0 per cent in 1980 - 1986. Conversely, the share of non-oil exports in total export declined from an average of 7.0 per cent from 1970 -1985 to 4.0 per cent between 1970 and 1986, but dropped further to 3.1 per cent from 2007-2011 (CBN, 2011).

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2.3 The Structure of Nigerian External Reserves

Foreign exchange reserves are also called international or external reserves. According to the International Monetary



Fund (IMF), external reserves are those external assets that are readily available to and controlled by a country's monetary authorities. Nigeria's external reserves at end 1960 stood at US\$217.3 million and by 1980 was US\$5.5 billion. Due to the poor economic performance and surging debt burden, the external reserves depleted significantly during the early 1980's.

However, at US\$2.8 billion in 1986, it rose marginally to US\$3.1 billion in 1989. By 1990 it was US\$4.5 billion. Although the reserves dropped from 1992-1993 level, it rose gradually to US\$9.1 billion by end 1994 due to favorable external position before dropping to US\$5.4 billion in 1999. During this period using the traditional benchmark of three months of import cover to estimate the adequacy of external reserves, in 1986, reserves could cover 11.5 months of imports while in 1989 and 1990 it could cover 8.8 and 9.6 months, respectively. By 1998, it had fallen to 2.2 months of import cover which is below the traditional benchmark. The external reserves dwindled to US\$5.4 billion in 1999, but later rose to US\$10.4 billion in 2001.

Following the severe pressure witnessed in the external sector, the external reserves fell to US\$7.5 billion in 2003. However it rose to US\$28.3 billion and US\$42.3 billion in 2005 and 2006, respectively, which was attributed to the improved performance of the oil sector. The months of import cover by the external reserves ranged between 7.6 months in 1999 to 25.6 months in 2006. By 2007, the external reserves stood at US\$51.3 billion. From 2001-2011, the import cover has consistently exceeded the 6.0 months requirement under the West Monetary Zone (WAMZ) convergence criteria, except in 2011 when it stood at 5.3. But, foreign exchange reserves in Nigeria averaged 12673.73 USD Million from 1960 until 2021, reaching an all-time high of 62081.86 USD Million in September of 2008 and a record low of 63.22 USD Million in June of 1968.

3. THEORETICAL AND EMPIRICAL LITERATURE

3.1 Theory of Open Economy

Theoretically, external sector modeling starts with a simple open economy model, where total spending in the domestic economy is divided into domestic and foreign components;

$$Y = (C - C^*) + (I - I^*) + (G - G^*) + EXP \quad (1)$$

Where; C = Domestic consumption of goods and services, C* = Consumption of foreign goods and services, I = Domestic investment in goods and service and I* = Investment in foreign goods and services. G = Government purchase of domestic goods and services, G* = Government purchase of foreign goods and services, EXP = Exports of domestic goods and services.

Further re-arrangement of the identity gives:

$$Y - C - I - G + EXP = C^* + I^* + G^* \quad (2)$$

Where; (C* + I* + G*) represents total expenditure on imports (IMP),

Therefore, components of total output becomes: $Y = C + I + G + EXP - IMP$ (3) Interaction between EXP and IMP reflect the external sector performance, if EXP exceeds IMP, external sector is said to be in surplus, but where the reverse holds, external sector is said to be in deficit.

3.2 Review of Empirical Literature

Onyimadu (2019) critically examined external sector responses to oil price shocks in Nigeria by employing a structural macroeconomic model (SMM) with quarterly data from 1981 to 2015. The SMM simulations of the external sector found that oil price shocks do have significant impacts on the components of Nigeria's external sector. Specifically, while oil price shocks elicited varying responses from all components of Nigeria's external

sector components, the simulated results showed very limited evidence of asymmetry in the responses to both positive and negative oil price shocks.

Omekwe, Kalu and Otto (2017) examined external sector



variables and economic growth in Nigeria from 1980-2016 using the Fully Modified Least Squares (FMOLS) to test the variables of gross domestic product, exchange rate, external debt and exports. The result of the co-integrating regression model which measures the long run behaviour of the explanatory variables using the FMOLS showed that the coefficient of determination is 98%. Meaning that the regressors have high explanatory power by extension the estimated model is a good fit. Based on their findings, they recommended that government should maintain a good market driven exchange rate policy in order to encourage local production and increase export which will turn increase economic growth.

Asuru and Wosu (2017) examined the effects of external sector variables on the agricultural sector in Nigeria using annual time series data from the period 1980 to 2016. The study utilized the Dynamic Ordinary Least Square (DOLS) approach. The DOLS result indicated that all the variables with such as balance of payments, exchange rate and official development assistance and stock of external debt are key determinants of agricultural development in Nigeria. The Co-integration result revealed the existence of a long term relationship among the variables.

Francis and Augustine (2019) used error correction model to examine the impact of the external sector aggregates on economic growth in Nigeria for the period 1980- 2016. The external sector aggregates used were external debt, exchange rate and export. The error correction results showed that exchange rate had a negative and significant impact on economic growth while external debt and export had positive and significant impact on GDP, respectively. The ECM term had the hypothesized negative sign and was statistically significant at 5% level. Economic growth adjusts to long-run at the speed of 29.98% per annum.

Mukamil and Rizwan (2016) investigated the behavior of external sector and its impact on economic growth of Pakistan. Quarterly data has been used for empirical analysis covering the period from 1990:Q1 to 2010:Q4. External sector indices have been developed containing

financial integration, net foreign assets and trade integration for theoretical relationships. The analysis is based on Vector Auto Regression followed by Vector Error Correction Model. Augmented Ducky fuller test confirms that all variables in the study are non-stationary at level, but stationary at first difference. The co-integration test suggests one co-integrating vector among the variables. The empirical findings of cointegration analysis showed that financial integration has positive while trade integration has negative effect on economic growth of Pakistan in the long run. However, the short run dynamics shows that output lag accounts for error correction confirming Granger representation theorem.

Bamidele, Olukayode, Oluwaseyi and Olorunfemi (2018) investigated the growth effects of external sector in Nigeria taking into consideration the role played by non-oil export commodities within the periods, 1980-2016. The Vector Error Correction Model (VECM) was employed to analyse the dynamic long-run and short-run estimates. The result showed that the parameter of non-oil export was positive and significant at 10% in the long-run indicating that the contribution of non-oil export commodity on output growth is weak. However, the parameter was positive and significant in the short-run at the conventional level. The findings also showed that output growth was directly influenced by investment, labour force and government expenditure while negatively affected by exchange rate.

Alimi and Muse (2013) examined the role of exports in the economic growth process in Nigeria, using time series data covering 1970 to 2009 and adopting unit root testing, co-integration analysis and VAR Granger causality test to analyze the time series. The researchers discovered long run relationship amongst the variables and unidirectional between economic growth and exports.

Rahnaddi and Ichhashi (2011) developed a multivariate error correction model and found a significant relationship between exports and economic growth in the Indonesian economy, but found no supporting evidence of positive causality from intermediate imports to GDP per capital.

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Also, Usman, Ashfaq and Mushtaq (2012) in an attempt to understand the causality between export and economic growth, investigated the impact of export on economic growth in Pakistan using ordinary least square. They discovered a strong positive and significant effect of export on economic growth,

Noel and Gulasekaran (2010) examined trade affects and equilibrium rate of unemployment. Having incorporated firm-union bargaining considerations into a model with a booming external sector and a stagnating manufacturing sector, they found out that a sustained improvement in the terms of trade lowers unemployment. To empirically investigate the predicted determinants of the unemployment rate, they used data for Australia (a country whose prosperity had always depended on the value of its exports), to find strong evidence that higher export prices, capital accumulation in tradeable goods industries and a lower unemployment benefit replacement rate, each reduced the equilibrium unemployment rate.

Muslehud, Ghani and Siddique (2003) studied openness in economic growth with the objective of investigating the effects of openness on economic growth by using VAR methodology. Major findings of the study confirmed that openness is positively related to economic growth in long run. It was found from the results that economic growth is only a long run process, not a short run process.

4. METHODOLOGY

4.1 Model Specification

The model for this study is based on the theory of open economy but the analytical framework is centered on the works of Yaqub (2010) used different types of explanatory

variables to capture the external sector and used Unemployment Rate (as dependent variable. The present study used foreign exchange reserves (FXR) and trade openness (TOP) as explanatory variables to capture the external sector variables and used unemployment rate (UNE) as dependent variable. Thus, the functional relationship is stated as follows:

$$UNE = f(FXR, TOP)$$

(1)

Accordingly, the econometric forms of the models were stated as:

$$UNE_t = \beta_0 + \beta_1 FXR_t + \beta_2 TOP + \mu_{2t}$$

(2)

Where;

UNE = Unemployment Rates, FXR = Foreign Exchange Reserves, TOP = Trade Openness

Also the study tried the log-linear specification on the relationship in equations (1) and (2). That is, non-linear form of the relationship. So, the Cobb-Douglas (aggregate production function) variety was specified, estimated and compared with the linear version. The log-linear specification was adopted in order to place all the variables in the models on the same scale or level and to minimize the problem of multicollinearity. Accordingly, in practical economic research, the standard practice is to try both the linear and non-linear forms of the relationship and analyze the one that gives the best result.

Hence, the Cobb-Douglas (aggregate production function) variety for the three models was specified as follows:

$$UNE_t = \beta_0 (FXR_t)^{\beta_1} + (TOP)^{\beta_2} + \mu^{2t} \quad (3)$$

Equation above was transformed to log and represented in an ARDL as follow:

$$UNE_t = (\beta_0) + \beta_1 \text{Log}(FXR_t) + \beta_2 \text{Log}(TOP_t) + \mu_{2t} \quad (4)$$



$$\Delta UEN_{t,j} = C_0 + C_1 UNE_{t-1,j} + C_2 FXR_{t-1,j} + C_3 TOP_{t-1,j} + \sum_{i=1}^{n1} a_{1i,j} \Delta UNE_{t-1,j} + \sum_{i=0}^{n2} a_{2i,j} \Delta FXR_{t-1,j} + \sum_{i=0}^{n3} a_{3i,j} \Delta TOP_{t-1,j} + \mu_t \quad (5)$$

Where; UNE=Unemployment rate, FXR= Foreign exchange reserves, TOP= Trade openness, C₀= Constant term, C₁-C₃, a₁-a₃=Slope parameters, μ_t= Error term, Δ= Change operator, t₁= Lag period, t= time and Σ= Summation.

5. RESULTS AND DISCUSSION

5.1 Analysis and Discussion of Empirical Results

Table 1: Descriptive Statistics for Underlying Series.

Measurement	UNE	FXR	TOP
Mean	10.12952	27207.27	34298.05
Maximum	35.00000	405200.0	262567.5
Minimum	4.000000	119.0400	0.033500
Std. Dev.	5.433335	62206.22	81473.73
Skewness	2.596332	5.513216	2.079818
Kurtosis	11.94893	34.07673	5.606458
Jarque-Bera	187.3325	1902.854	42.16835
Probability	0.000000	0.000000	0.000000
Observations	42	42	42

Source: *Researcher's Computation from (E- view 12)*

The essence of the descriptive statistics is to ascertain stability of the time series. As reported in Table 1, the approximate mean of unemployment rate (UNE), foreign exchange reserves (FEX) and trade openness (TOP) are; 10.13%, ₦27207 million, and ₦34298 million

respectively. The approximate standard deviation of unemployment rate (UNE), foreign exchange reserves (FEX) and trade openness (TOP) are; 5.4%, ₦62206 million, and ₦81474 million respectively. The analysis showed that, the dependent variable (UNE) converged around its' mean, while the independent variables (FXR and TOP) do not converged around their means. The skewness result showed that all the variables have positive values, meaning that they have high tails. More so, the kurtosis results showed that, UNE, FXR and TOP all have leptokurtic distributions relative to normal, since the approximate values for kurtosis are more than 3. This indicated a flatter than normal distribution and the variables have large tails. That is, their central peaks are higher and sharper. Given the results above, it was concluded that the statistical properties of the time series are largely non-normally distributed, which may have resulted from the problem of unit root. This necessitated the stationarity test of the time series.

Table 2: Results of ADF Unit Root Test for the Model

Variables	Unit Root Test @ Level		Unit Root Test @ First difference		Order of integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
TOP	-5.560620	-2.938987	Stationary @ level		1(0)
UNE	0.245327	-2.938987	-4.123822	-2.938987	1(1)
FXR	-2.121695	-2.938987	-7.151420	-2.938987	1(1)



Source: Computed by the Researcher’s from E-Views 12.

Note: *UNE=Unemployment rate, FXR=Foreign exchange reserves, TOP = Trade openness*

The test of stationarity via the Augmented Dickey Fuller (ADF) unit root test for the variables in the estimated model showed that only one variable (TOP) is stationary at level or order zero. This is because the ADF test statistic value is greater than the critical value at 5%. However, variables such as UNE and FXR which were not stationary at level, were differenced once and became stationary at first differences; 1(1). Given that some of the variables were integrated of order 1(0) and some 1(1); the requirement to fit in an ARDL model to test for long run relationship is satisfied.

Table 3: ARDL Bounds Test Result for Unemployment Rate Model

Model		F-Statistic = 16.35843
F(FXR), (TOP)		K = 2
Critical Values	Lower Bound	Upper Bound
10%	2.618	3.532
5%	3.164	4.194
1%	4.428	5.816

Source: Computed by the researcher’s from E-Views 12.

Note: *UNE=Unemployment rate, FXR=Foreign exchange reserves, TOP = Trade openness*

The bound test using unemployment rate (UNE) as the dependent variable showed that the F-statistic value of 16.35843 is higher than the upper bound critical value of 4.194 at 5% level of significance using restricted intercept and no trend in specification for the model. The result showed that all the explanatory variables which measures external sector (FXR and TOP) as well as unemployment rate have long run relationship in Nigeria.

Table 4: Estimated ARDL Long Run Coefficients for Unemployment Rate Model.

Regressors	Coefficient	t-Statistic	P-Value
LOG(FXR)	-1.197503	-1.724945	0.2163
LOG(TOP)	-0.409421	-0.709275	0.9376
C	-13.81089	-1.102035	0.3230

Source: Computed by the researcher’s from E-Views 12.

Note: *UNE=Unemployment rate, FXR=Foreign exchange reserves, TOP = Trade openness*

Table 4 showed the estimated ARDL long run coefficients to determine the relationship between external sector variables and economic development in Nigeria. The estimated result showed that foreign exchange reserve has negative relationship with unemployment rate in Nigeria. This means that, a percentage increase in foreign exchange reserves will lead to a decrease in unemployment rate by 1.197503%. The estimated result showed that trade openness has negative relationship with unemployment rate in Nigeria. This means that, a percentage increase in trade openness will lead to a decrease in unemployment rate by 0.409421%. Meanwhile, the value of the t-statistic for the coefficients of foreign exchange reserves, exchange rate and trade openness, were not statistically significant in explaining the level of reduction in unemployment rate in Nigeria. Thus, the influence of the explanatory variables on unemployment rate in the long-run will not be too noticeable in Nigeria.



Table 5: Error Correction Representation for the Unemployment Rate Model

Regressors	Coefficients	P-Value	Critical Value @5%
D(UNE)	-0.454164	0.0820	0.0500
Log(FXR)	-1.040964	0.0591	0.0500
Log(TOP)	0.881198	0.0020	0.0500
ECM (-1)	-0.479178	0.0007	0.0500
C	-6.535255	0.2482	0.0500
Adjusted R ² = 0.73462	Prob(F-stat) = 0.0000	Durbin-Watson Stat	1.6955

Source: Computed by the researcher's from E-Views 12.

Note: *UNE=Unemployment rate, FXR=Foreign exchange reserves, TOP = Trade openness*

The short-run dynamic model presented on Table 5 showed that the coefficient of adjusted R-squared is 0.7346. Meaning that, the dynamic model is a good fit. Therefore, the variation in unemployment rate brought about by the explanatory variables is about 73%. Therefore, the explanatory power of the estimated model is about 73%. To buttress the good fit is the overall significant of the explanatory variables in the model; given the probability value of f-statistic (0.0000) which is less than 5% level of significant. Thus, the explanatory variables are significant in explaining decreasing unemployment rate in Nigeria during the period of study. One of the outmost important parameters in the estimated ARDL short-run model is the coefficient of the ECM which theoretical must be negative and statistically significant. From the estimated model, the coefficient of ECM has the hypothesized negative sign of -0.47917 and statistically significant at 5% level with p-value of 0.0003. Thus, the deviations from the short-term in unemployment rate adjusted to long run equilibrium at a speed of 47.9%. This showed that the disequilibria in unemployment rate in the previous year were corrected for in the current year at a speed of about 48percent. Also, the coefficient of the Durbin Watson (DW) test is 1.6955

which is not too far from 2.0; based on rule- of-thumb, implies that there exists a lesser degree of serial autocorrelation in the model. Therefore, the explanatory variables in the model are not serially dependent. Therefore, the model is valid for policy making and implementation.

Meanwhile, the estimated result showed that, the lag value of unemployment rate is negatively related with the current value and statistically not significant. Thus, a percentage change in the lag value of unemployment rate will cause a 4.45164percent decrease in the previous value of unemployment rate. Also, the coefficient of foreign exchange reserve has negative relationship with unemployment rate in Nigeria. This means that, a percentage increase in foreign exchange reserves will lead to a decrease in unemployment rate by 1.040964%. But the foreign exchange reserves does not impacted on unemployment rate during the period of study as a result of the fact that the p-value of 0.0591 which is greater than the critical value at 5%. Thus, the null hypothesis which state that, there is no significant relationship between foreign exchange reserves and unemployment rate was accepted and the alternative hypothesis rejected.

The estimated result showed that trade openness has positive relationship with unemployment rate in Nigeria. This means that, a percentage increase in trade openness will increase unemployment rate by 0.88198%. This does not conform to a priori expectation/economic theory. Nevertheless, trade openness impacted on unemployment rate during the period of study as a result of the fact that the p-value of 0.002 which is less than the critical value at 5%. Thus, the null hypothesis which states that, there is no significant relationship between trade openness and unemployment rate was rejected and the alternative hypothesis accepted. Thus, the influence of the explanatory variable on unemployment rate in the short-run will be evident in Nigeria.



Table 6: Post-Estimation Tests Results for Serial Correlation, Heteroschedasticity and Stability Tests

Test type	Test Stat.	p-value	Critical Value @ 5%
Serial Correlation	Chi Square (X^2)	0.7386	0.05
Heteroscedasticity	Chi Square (X^2)	0.6268	0.05
Stability	t-Statistics	0.3834	0.05

Source: Researchers' Computed Result from (E-views 12)

The various diagnostic test results conducted to validate both the estimated long and short runs ARDL models were presented in Table 6. Based on the serial correlation using Breusch-Godfrey test LM test, to test the null hypothesis of no serial correlation, against the alternative hypothesis of serial correlation in the estimated short-run and long-run

models at 5% level. The result showed that, serial autocorrelation does not exist in the estimated quality of life and unemployment rate models. This is because the chi-square p-values for both models which are; 0.6948 and 0.7386 respectively are greater than the critical value probability of (0.05).

In the same way, the Autoregressive Conditional Heteroskedasticity (ARCH) result showed that, heteroskedasticity is not a problem in both quality of life and unemployment rate models. This is because the chi-square p-values for the models which are, 0.4126 and 0.6268 respectively are greater than the critical value probability of (0.05). Also, the stability test results showed that the estimated models are stable. This is because the t-statistic p-values in both models are greater than the critical value probability of (0.05).

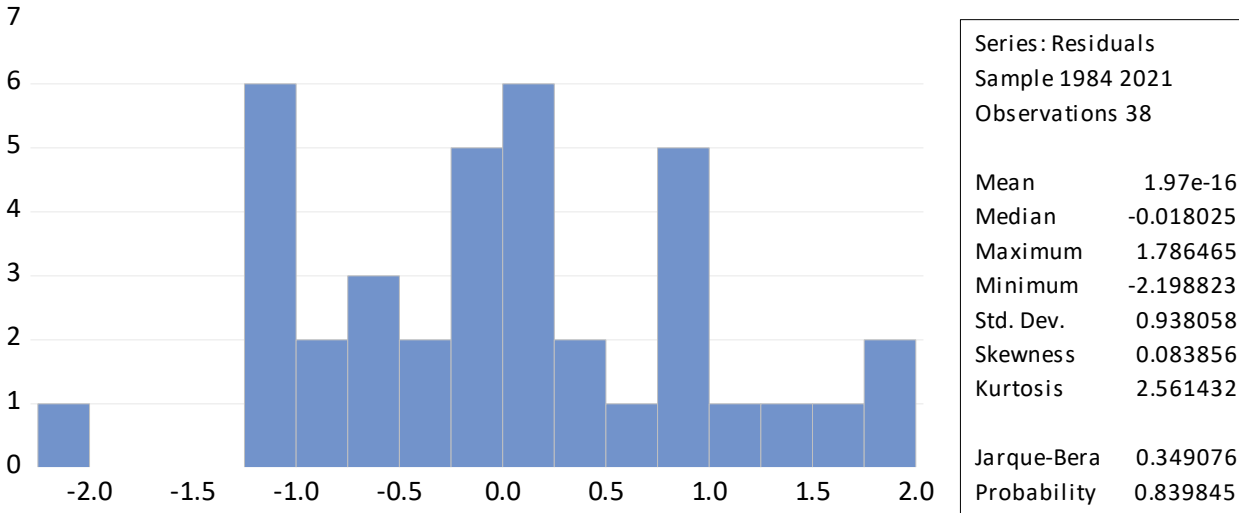


Figure 1: Normality Test for Unemployment Rate Model

The Jarque-Bera statistic is applied to examine whether the error term in the estimated model is normally distributed. In order to do this, the probability of Jarque-Bera statistic is compared with the critical p-value at 5 per cent

significance level. The null hypothesis is upheld if the probability of the Jarque-Bera statistic is greater than the critical p-value at 5 per cent significance level.



The normality test result showed that, the error term is normally distributed at 5% level of significance. This is because, the probability value of the Jarque-Bera statistic is 0.83984; and this value is greater than 5% critical value. Meaning that, the Jarque-Bera statistic hypothesis of normally distributed residuals in the model is accepted.

5.2 Discussion of Findings

The findings of the study were discussed based on the ARDL result to ascertain if the stated objectives of the study were successfully accomplished.

5.2.1 The effect of the foreign exchange reserve on unemployment rates in Nigeria: The estimated long-run results showed that, there is a negative relationship between foreign exchange reserves and unemployment rate in Nigeria during the period of study. This means that, a percentage increase in foreign exchange reserves will potentially decrease the rate of unemployment in Nigeria. Similarly, in the short-run, the estimated results showed that, there is a negative relationship between foreign exchange reserves and unemployment rate in Nigeria during the period of study. But in both the long-run and short-run estimated results, foreign exchange reserves do not impact on quality of life in Nigeria. The implication of the finding is that, judicious use of Nigeria foreign exchange reserves has contributed to the development of the economy in terms of employment creation and reduction in unemployment rate. In line with the findings,

5.2.2 The impact of trade openness on unemployment in Nigeria: The analysis of the ARDL long-run results showed that, in the long-run, there is a negative relationship between trade openness and unemployment rate in Nigeria during the studied period. Thus, a percentage increase in trade openness will decrease the level of unemployment in Nigerian. Also, the estimated short-run result showed that trade openness has positive relationship with unemployment rate in Nigeria. This means that, a percentage increase in trade openness will increase unemployment rate. This does not conform to a priori expectation/economic theory. Nevertheless, trade

openness impacted on unemployment rate during the period of study. Thus, the null hypothesis which state that, there is no significant relationship between trade openness and unemployment rate was rejected and the alternative hypothesis accepted. Thus, the influence of the explanatory variable on unemployment rate in the short-run will be evident in Nigeria. The finding is in support of the scholarship of Muslehud, Ghani and Siddique (2003) studied openness in economic growth and confirmed that openness has long-run relationship with the economy. Also, Noel and Gulasekaran (2010) examined trade affects and equilibrium rate of unemployment in Australia and found strong evidence that higher export prices, capital accumulation in tradeable goods industries and a lower unemployment benefit replacement rate, each reduced the equilibrium unemployment.

6. CONCLUSION AND RECOMMENDATIONS

This study used ARDL approach to examined selected external sector variables and unemployment in Nigeria during the period of 1980 to 2021. As Nigeria strives for development vis-a-vis increase employment and low rate of unemployment, there is the need for improvement in the external sector of the economy vis-à-vis foreign exchange reserves and trade openness amongst others. Meanwhile, the country's over dependence on foreign made goods which resulted to trade deficit has not help in the Nigeria development process. Added to this, is the declining foreign exchange receipts due to fall in oil prices.

Based on the empirical results, there is a long-run positive relationship between external sector variables and unemployment rate. In the short run, there is overall significant of the external sector variables and unemployment in terms in Nigeria. Therefore, to check the scourge of low export of finished goods, there is the need for fundamental changes in Nigeria's economic structures, especially in its production and consumption patterns. And to do this requires innovative and courageous policy measures. Palliative measures where necessary should be



put in place to cushion the impact of external sector on unemployment in Nigeria.

Based on these findings, the study recommended that, foreign exchange reserves should be well utilized with a view to increasing the rate of employment. Similarly, to achieve long-term solutions to the problem of low external reserves, there should be deliberate effort towards promotion of the country's export trade and stimulation of domestic production to liberate the Nigerian economy from the shackles of wants and excessive dependence on external economics.

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