Mikailalsys Journal of Mathematics and Statistics

e-ISSN : 3030-816X
p-ISSN : 3030-8399

Index : Harvard, Boston, Sydney University, Dimensions, Lens, Scilit, Semantic, Google, etc

https://doi.org/10.58578/MJMS.v3i1.4053

# INFERENCE OF SOME MACROECONOMIC VARIABLES ON NIGERIA UNEMPLOYMENT RATE

**David Ikwuoche John[1], Salawu I. Saheed[2], Adehi U. Mary[3]**

[1]Federal University Wukari, Nigeria; [2]Creative Associates International, Abuja, Nigeria

[3]University of Abuja, Nigeria

davidij@fuwukari.edu.ng; salahus74@gmail.com

**Article Info:**

| Submitted: | Revised: | Accepted: | Published: |
|---|---|---|---|
| Oct 6, 2024 | Oct 25, 2024 | Nov 5, 2024 | Nov 10, 2024 |

**Abstract**

This research investigates the impact of foreign direct investment (FDI), government expenditure (GOE), and inflation rate (IFR) on the unemployment rate (UPR) in Nigeria from 1985 to 2021 through Autoregressive Distributed Lag (ARDL) modeling approach. An initial assessment to test the significance of signals between each independent variable and UPR was performed using rolling correlation analysis. Subsequently, the bounds test methodology to examine cointegration among between the FDI, GOE, IFR, and UPR was performed. Additionally, the causal relationship between these economic variables was performed through the Error Correction Model (ECM) approach. The estimated ARDL model parameters stability was determined using the cumulative sum (CUSUM) of squares chart. The Augmented Dickey Fuller unit root test suggests that the variables are stationary at first differences (I(1)). The bounds test revealed that the variables are cointegrated at 1%, 5%, and 10% indicating a long run relationship between UPR and FDI, GOE, and IFR. The ARDL results indicates that at 5%, a unit increase in FDI at lag one have a long run significant decreasing impact on UPR by 19.96%. But in the short run, the FDI at lag one has a significant increasing effect on UPR by 7.23%. However, the CUSUM of square chart shows unstable parameter estimation based on the Akaike Information Criteria selected model, ARDL (1, 3, 0, 0). The study concludes that UPR is being influenced by FDI in reducing UPR in the long run. Recommendation based on the findings is that FDI should be considered most important when policies are drafted for tackling the issue bordering UPR in Nigeria.

**Keywords:** Macroeconomic variables; Autoregressive distributed lag; Bounds test; Co-integration; Error correction model

## INTRODUCTION

Unemployment has been one of the most challenging issue faced by most developed and developing countries (Nigeria) and resulting to socio-economic problems. According to Akeju & Olanipeun (2014), unemployment rate (UPR) has been on the high and on a constant rising trend over the years, and this has been one of the greatest challenges of the Sub-Saharan African economies till this day. Nigeria's unemployment rising rate is known to be present with a biting effect on more than two-third of her population. As at December 2018 to March 2021, UPR in Nigeria rose from 27.1 percent to 33.3 percent according to the National Bureau of Statistics, (NBS). The bureau explained that the number of unemployed Nigerians rose by 23.19 million in the fourth quarter of 2020 on the back of job losses occasioned by the outbreak of Covid-19 pandemic and its stifling impact on businesses during the period (Egwuatu 2021). The unemployed youth population is about 20.3 Million, about 4.5 million new entrants into the labor market annually, 2.2 million primary school leavers not proceeding to secondary school, one million secondary school leavers not proceeding to the tertiary level and roughly 600,000 graduates annually, not finding any placement after graduation. This tend to put the nation in great danger, as world bank survey in 2011 reported that 40 percent of those who join militancy movement indicated that they are motivated by unemployment, while 50 percent of those involved in criminal activities are also stimulated by unemployment. Unemployment has been recognized as a key variable that causes danger to the Government of a nation (Philip *et al.*, 2013). Unemployment is a multidimensional issue that affects both the economic activities of any country and the social structure of societies. These two dimensions of unemployment on any society create complexities and entails adopting extensive measures to solve the problem. Every policy maker (either from fiscal policy or monetary policy) main objective is to attain optimum economic growth with positive long run effect on the population. Unemployment remains as one of the economic factors that can deteriorate the growth of any country and its continuous growth rate in many countries and Nigeria specifically shows that various macroeconomic policies proffered by government have been unable to achieve sustainable reduction in unemployment and robust economic growth rate. In such form, it is not surprising to see developing and developed economies plunged into recession recent time. This might not be roped around the failure in the macroeconomic management.

The essence of macroeconomic management underlines the rationale for the existence of government as a vital economic agent. Following the oil boom of the late 1970s, there was mass migration of people, especially the youth, to the urban areas seeking for jobs (Yelwa *et al.*, 2015). In examining UPR, various people around the world collaborate and many studies have proved that the high level of UPR have a negative impact on the Government of a nation (Nigeria). These include the works of Fuad (2011) and Alhdiy *et al.* (2015). Other significant studies are by Farouk *et al.* (2021a) and (2021b), Agog *et al.* (2021), and David *et al.* (2023) revealed a steady increase of Nigeria UPR where inflation and interest rates play a major factor in the steady increase. Similarly, in Nigeria, many studies in this regard have shown that the Ordinary Least Square (OLS) and the Error Correction Model (ECM) has been the frequently applied method in analyzing UPR data even when the order of integration do not support the application of it (David *et al.*, 2024). The effect of unemployment on Nigerian government remain understudy despite evidences have shown that shocks which increases unemployment is likely to increase. Since the UPR in Nigeria continue to increase, this work seek to study UPR using Autoregressive Distribution Lag (ARDL) modeling approach to determine the impact of government expenditure (GOE), Foreign Direct Investment (FDI), and Inflation rate (IFR) on UPR in Nigeria.

## METHODS

The study employs a secondary source of data. The annually time series data was collected from the National Bureau of statistics, Central Bank of Nigeria (CBN), World Bank Development Indicators and other journals and articles which covers the period

1985-2021. This study uses both descriptive and econometric analysis. The descriptive approach used is to show the trend and variation of FDI, GOE, IFR and UPR to give a clear view on how the variables change over time in Nigeria. In addition, the econometric approach used is to investigate the directional impact of FDI, GOE, and IFR, on UPR. The Auto-Regressive Distributed Lag (ARDL), bounds test methodology for testing the existence of cointegration between the variables and Error Correction Model (ECM) are used to investigate the causal bond between FDI and UPR, GOE and UPR, and IFR and UPR.

**Model Specification**

On a general form, the model specification is a formulation of UPR as a function of variability (relationship) with FDI, GOE and IRF. The representation of the model specification is presented below as follows

$$UPR = \phi\left(FDI, GOE, IFR\right) \qquad \phi_1, \phi_2, \phi_3, < 0 \tag{1}$$

A priori expectation of FDI, GOE and IFR for this study is negative or less than zero. This is because in a long run these variables effect on UPL is paramount. If they go higher than required threshold of tolerance their impact will definitely be of concern. On the short run the effect could be positive and greater than zero but it's not a reliable point to classify FDI, GOE and IFR impact as adverse. Theoretically, it is expected that a low and stable GOE, FDI and IFR supports UPR and vice versa.

**Formulated ARDL Model for All Variables**

Founded on the model specification as formulated in equation (1), the research model is a formulation of the ARDL model, which captures all variables under study. Therefore, the formulated research model is as follows:

$$\begin{aligned}\Delta R\left(UPR\right)_t &= \beta_0 + \beta_1 R\left(UPR\right)_{t-1} + \beta_2 \mathrm{R}\left(GOE\right)_{t-1} + \beta_3 R\left(FDI\right)_{t-1} + \beta_4 R\left(IFR\right)_{t-1} + \sum_{i=1}^{j} \theta_{1i} \Delta R\left(UPR\right)_{t-i} \\ &+ \sum_{i=1}^{j} \theta_{2i} \Delta R\left(GOE\right)_{t-i} + \sum_{i=1}^{j} \theta_{3i} \Delta R\left(FDI\right)_{t-i} + \sum_{i=1}^{j} \theta_{4i} \Delta R\left(IFR\right)_{t-i} + \varepsilon_t\end{aligned} \tag{2}$$

where, $\Delta$ is the 1st difference operator, $R(URP)$ is the return value of Nigeria unemployment rate, $\beta_0$ is the intercept, $\beta_1$, $\beta_2$, $\beta_3$, and $\beta_4$ are the constant elasticity coefficient for returns of URP, GOE, FDI, and IFR, respectively. Also, $\varepsilon$ is the error term which is independently and identically distributed with zero mean, $\mu$ and constant variance, $\sigma^2$. The apriori expectations for the model parameters are assumed to be $\beta_0 > 0$, $\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 < 0$, and $\beta_4 < 0$.

**Bounds Test**

Next is the bounds test hypothesis for testing the long-run effect between the autonomous variable and the repressor variable dependent on the F-test, which tests the consolidated significance of the boundary estimates at one period lag level of the variables in equation (2). The test hypothesis is $H_0$: $\beta_1 = \beta_2 = 0$ verse $H_1$: $\beta_1 \neq \beta_2 \neq 0$. The asymptotic scattering of acute values is gotten for circumstances where entirely repressor's are strictly $I(1)$ and $I(0)$ or jointly cointegrated. Pesaran & Pesaran (1999) and Pesaran *et al.* (2001) reported two arrays of acute values. The two arrays of acute values give acute value bounds for categorizing the repressors into purely $I(1)$, $I(0)$ or jointly cointegrated. Conversely, Pesaran & Pesaran (1999) and Pesaran *et al.* (2001) arrays of acute values were for large sample sizes. A correction was made and offered by Narayan (2005) for sample with small sizes vacillating from $n = 31$. The null hypothesis of no cointegration is, not accepted if the computed F-statistic value is greater than the upper bound of the acute values. If the bounds test confirms the presence of a cointegration bond among the factors then it implies that there is a far-haul bond between the predictor and repressor variables, that is, among UPR and FDI, UPR and GOE, and UPR and IFR. In determining the long-run relationship, an error correction model is to be established and implemented.

**Error Correction Model (ECM)**

In this work, the ECM within bivariate relationship system is used to examine the direction of impact between UPR and GOE, FDI, and IFR respectively. Also, the ECM has an interesting property of capturing the velocity of adjustment of growth and the independent variables considered for this research. The ECM is chosen over other alternative techniques because of its favorable response to both large and small samples (David & Idi, 2024). For this research three ECM are presented where each represents a model.

**Model I: UPR against GOE, FDI and IFR**

If UPR is co-integrated with GOE, FDI, and IFR, the multivariable co-integration in ECM can be represented in the following form,

$$\Delta R(UPR)_t = a_o + \sum_{i-1}^{n} a_{1i}\Delta R(UPR)_{t-i} + \sum_{i-n}^{n} a_{2i}\Delta R(GOE)_{t-i} + a_{3i}\Delta R(FDI)_{t-i} + \sum_{i-1}^{n} a_{4i}\Delta R(IFR)_{t-i} + a_5 EC_{t-1} + \mu_t \quad (3)$$

where, $EC_{t-1}$ is a one period lagged error adjustment term (EAT) captured from the integration regression, $UPR_t$ is the unemployment at time $t$ and $GOE_t$ is government expenditure at time $t$, $FDI_t$ is foreign direct investment at time $t$, and $IFR_t$ is the inflation rate at time $t$.

**Unit Root Test**

The Unit root test also known as the stationarity test, is a statistical test that is used to determine the order of integration (David *et al.*, 2024). The Augmented Dickey-Fuller (ADF) test and the Phillips-Perrons (PP) test are commonly used unit root tests. In this study we will employ the ADF test to determine the order of integration of the variables.

**Model Selection**

In this study the lag selection is employ. The lag selection is an estimator of out – of-sample prediction error and thereby relative quality of statistical model for a given set of data, given a collection of the Akaike Information Criteria (AIC) estimate the quality of each model, relative to each of the other models election.

$$AIC = -2\ln(L) + 2k \quad (4)$$

where, L is the likelihood and K is the number of parameters in the model.

## RESULTS

An initial analysis of FDI, GOE, IFR and UPR were computed. Table 1 displays the descriptive statistics of the variables, were the mean, standard deviation, minimum and maximum values of the economic variables under study are presented. The results show that the values FDI ranges from 0.19 to 8.84 with a mean value of 2.81, GOE ranges from 0.91 to 9.44 with a mean value of 4.178, IFR ranges 5.4 to 72.84 with a mean value of 19.12, UPR ranges from 3.2 to 9.8 with a mean value of 4.93. All the variables are skewed positively but UPR and IFR are highly leptokurtic since their kurtosis are greater than three. The result of Jarque-Bera statistic revealed that the FDI and GOE are normally distributed since their respective p-values are greater than 5% while IFR and UPR are not normally distributed as their p-values are less than 5%.

**Table 1.** Descriptive Statistics of Series 1985 to 2021

| | FDI | GOE | IFR | UPR |
|---|---|---|---|---|
| **Mean** | 2.805 | 4.178 | 19.12 | 4. 931 |
| **Median** | 1.880 | 4.404 | 12.56 | 4.030 |
| **Maximum** | 8.840 | 9.449 | 72.85 | 9.790 |
| **Minimum** | 0.190 | 0.912 | 5.39 | 3.200 |
| **Std. Dev.** | 2.586 | 2.928 | 17.45 | 1.839 |
| **Skewness** | 0.976 | 0.475 | 1.776 | 1.568 |
| **Kurtosis** | 2.757 | 1.792 | 4.847 | 4.051 |
| **Jarque-Bera** | 5.965 | 3.641 | 24.70 | 16.86 |
| **Probability** | 0.051 | 0.162 | 0.00001 | 0.00022 |
| **Sum** | 103.8 | 154.6 | 707.4 | 182.5 |
| **Sum Sq. Dev.** | 240.59 | 308.6 | 10951.30 | 121.7 |
| **Observations** | 37 | 37 | 37 | 37 |

Table 2 shows the unit root tests of the variables. The table shows the ADF test results and the Phillips-Perron test results. The null hypothesis is that the series has a unit root. The ADF unit root test was used to test if the variables meet this condition. The ADF results exhibited in Table 2, show that all variables are stationary. However, they become stationary at first differences. Therefore, all variables are integrated of order one, that is, they are I (1). This means that the ARDL model can be used to test for the co-integration between the variables.

**Table 2.** Unit root test

| | Augmented Dickey Fuller | | |
|---|---|---|---|
| **Variables** | **t-statistics** | **P-value** | **Integration order** |
| **UPR** | -6.314 | 0.0000 | I(1) |
| **FDI** | -8.991 | 0.0000 | I(1) |
| **GOE** | -6.474 | 0.0000 | I(1) |
| **IFR** | -5.692 | 0.0000 | I(1) |

Figure 1 shows the empirical plots of the study variables. The result of the plot displays that UPR is on a geometric increase, FDI and IFR on a stationary pattern while GOE is on a exponential decrease.

**Rolling Correlation of UPR and FDI, UPR and GOE, UPR and IFR**

In this part of the research, Table 3 presents the outcomes of the Rolling Correlation (RC) for UPR and FDI, UPR and GOE, UPR and IFR. The rolling correlation is useful to test the significance of signals before moving onto further analysis of the ARDL bounds testing. To test the existence of a signal against noise, Engle and Granger (1987) proposed a Monte Carlo test approach based on the standard deviations of rolling correlations. In this test, the standard deviations of empirical rolling correlations are compared to those of two correlated white noise series replicated many times with the same magnitude of correlation as the empirical series.

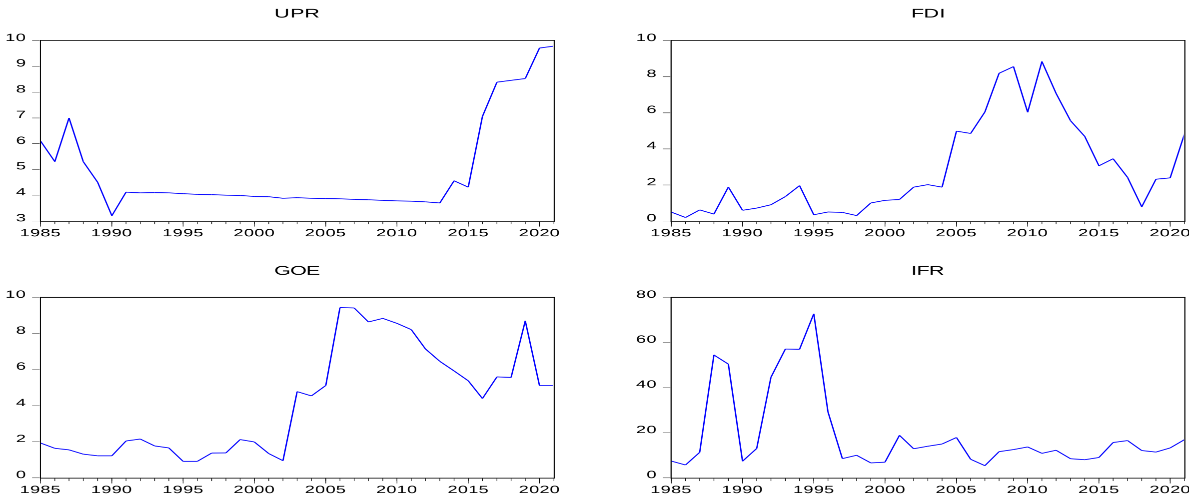


**Figure 1: Empirical plots of UPR, FDI, GOE and IFR**

**Table 3.** Rolling Correlation Width for UPR and FDI, UPR and GOE, UPR and IFR

| Rolling Correlation Width for UPR and | Width | SD Rolling Correlation | Confidence Interval | |
|---|---|---|---|---|
| | | | **5% CI** | **95% CI** |
| **FDI** | **3** | 0.6895 | 0.7511 | 0.6527 |
| | **5** | 0.4012 | 0.5571 | 0.4161 |
| | **7** | 0.2696 | 0.4759 | 0.3191 |
| | **10** | 0.1684 | 0.4061 | 0.2414 |
| **Rolling Correlation Width for UPR and** | **Width** | **SD Rolling Correlation** | **Confidence Interval** | |
| | | | **5% CI** | **95% CI** |
| **GOE** | **3** | 0.6751 | 0.7515 | 0.6513 |
| | **5** | 0.4928 | 0.5519 | 0.4250 |

| | | | | |
|---|---|---|---|---|
| | **7** | 0.4344 | 0.4716 | 0.3163 |
| | **10** | 0.4182 | 0.4040 | 0.2442 |
| **Rolling Correlation** | **Width** | **SD Rolling Correlation** | **Confidence Interval** | |
| | | | **5% CI** | **95% CI** |
| **Width for UPR and IFR** | **3** | 0.6250 | 0.7510 | 0.6531 |
| | **5** | 0.4252 | 0.5550 | 0.6232 |
| | **7** | 0.3873 | 0.4693 | 0.3221 |
| | **10** | 0.2730 | 0.3920 | 0.2414 |

The rolling correlation standard deviations (SDs) in Table 3 are inside the limits for the widths 3, 5, 7, and 10, for UPR and FDI, UPR and GOE, and UPR and IFR. Thus, the signal between the UPR and FDI, UPR and GOE, UPR and IFR are not significant for wider window lengths; hence, the rolling correlations between series are superfluous. But their rolling correlation SDs is inside the limits for the widths 3, 5, 7 and 10. In Figure 2, the dashed red lines show the limits of the 95% confidence interval for the mean of the average rolling correlations over the time points, which is shown by the horizontal solid line.

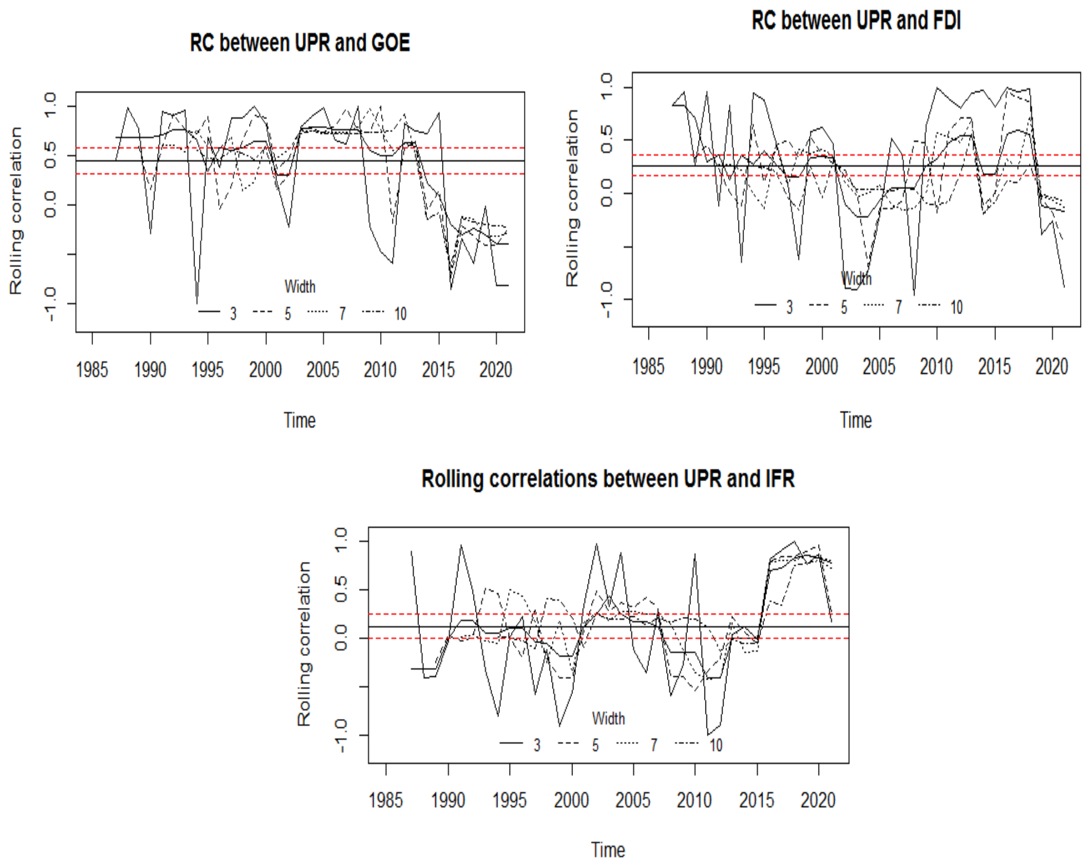


**Figure 2. Rolling Correlation between UPR and FDI, UPR and GOE, UPR and IFR**

**Formulated Research Model**

This part of the research presents the outcomes of the Bounds Test, the ARDL model, the ECM for UPR, FDI, GOE, and IFR, AIC plot for model selection, and the Cumulative Sum (CUSUM) of squares charts to observe the stability of the estimated parameters.

**Bound Test for UPR, FDI, GOE and IFR**

The outcome of the bound test for the relationship between UPR, FDI, GOE and IFR as shown in Table 4 indicates that the calculated F-Statistic is 9.71. This value max the higher bounds acute value of 4.41 at SL of 5%. This implies that UPR, FDI, GOE, and IFR are co-integrated. Thus, it can be concluded that a long run relationship exists between UPR, FDI, GOE, and IFR.

**Table 4.** Bounds Test for UPR, FDI, GOE, and IFR

| **F-Bounds Test** | | **Null Hypothesis: No levels relationship** | | |
|---|---|---|---|---|
| **Test Statistic** | **Value** | **Signif.** | I(0) | I(1) |
| **F-statistic** | 9.71 | 10% | 2.74 | 3.81 |
| **K** | 3 | 5% | 3.25 | 4.41 |
| | | 1% | 4.31 | 5.64 |

**ARDL Model for UPR, FDI, GOE and IFR**

The ARDL Model selection of all the variables, that is, FDI, GOE, and IFR on UPR is ARDL (1, 3, 0, 0) since it has the small AIC value as shown in Figure 6. The results in Table 5 indicate that there is a huge effect on the first lags of UPR and FDI on UPR, while in IFR, GOE were not significant. Therefore, the selected model indicates that the present UPR would quiet upset the rate of UPR in the subsequent next one year and also FDI would quite upset UPR in the next one year.

**Table 5.** Estimated Long Run (ARDL) Model for UPR, FDI, GOE, and IFR

| **Variable** | **Coefficient** | **Std. Error** | ***t*-Statistic** | **Prob.*** |
|---|---|---|---|---|
| C | 0.08271 | 0.0352 | 2.3487 | 0.02013 |
| UPR(-1) | -1.2005 | 0.2025 | -5.9306 | 0.00001*** |
| FDI(-1) | -0.1996 | 0.0744 | -2.6880 | 0.0114** |
| GOE | 0.0028 | 0.0336 | 0.0822 | 0.8362 |

| | | | | |
|---|---|---|---|---|
| IFR | 0.0274 | 0.0335 | 0.8169 | 0.4631 |
| D(FDI) | -0.0467 | 0.0297 | -1.5713 | 0.1327 |
| D(FDI(-1)) | 0.0723 | 0.0540 | 1.3433 | 0.1987 |
| D(FDI(-2)) | 0.0401 | 0.0305 | 1.3135 | 0.2262 |

** implies 10%, ** implies 5%, *** implies 1%*

**Table 6.** Short Run Error Correction Model for UPR, FDI, GOE, and IFR

| Variable | Coefficient | Std. Error | *t*-Statistic | Prob.* |
|---|---|---|---|---|
| C | 0.0827 | 0.0272 | 3.0579 | 0.00402 |
| D(FDI) | -0.0467 | 0.0251 | -1.8629 | 0.07519* |
| D(FDI(-1)) | 0.0723 | 0.0348 | 2.0751 | 0.04021** |
| D(FDI(-2)) | 0.0402 | 0.0232 | 1.7336 | 0.09023* |
| CointEq(-1)* | -1.2005 | 0.1821 | -6.5812 | 0.00001*** |
| R-squared | 0.6804 | | | |
| F-statistic | 15.4284 | | | |
| F-test p-value | 0.000001 | | | |
| DW-Statistic | 1.8156 | | | |

** implies 10%, ** implies 5%, *** implies 1%*

The Bounds test in Table 4 reveals the presence of cointegration and long run bond between UPR versus FDI, GOE, and IFR. So, the ECM model is of lag interval (1, 3). The long run coefficients in Table 5 reveals that in the long run, the coefficient of FDI is negative and has a great bearing on UPR, but GOE and IFR are positive and has no significant impact on UPR at 5% significance level. The ECM coefficient in Table 6 for UPR shows negative sign and highly significant which display how rapidly the variables move to steadiness. This further approves the actuality of a stable long run link among the factors with their several significant slacks. The coefficient of EC1 = -1.200455, point toward deviation from the long run on FDI is modified by 120.0455% in the next one year.

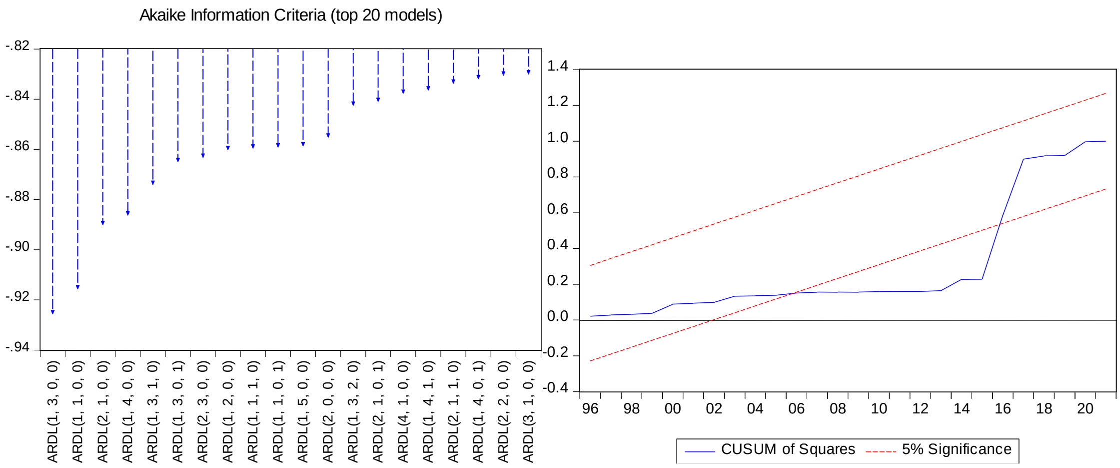


**Figure 3. ARDL Model and CUSUM of Squares for All Variables**

The CUSUM test indicates that the parameters of UPR, FDI, GOE and IFR in the ARDL model were unstable since the CUSUM squares line fall outside the two critical lines at 5% SL. The stability test conducted using the CUSUM Square indicates that the parameters are wavering during the sampled period (1985-2021).

## DISCUSSION

In this study, an Autoregressive Distributed Lag (ARDL) model and CUSUM Square parameter stability test was fitted and plotted, respectively for UPR versus FDI, GOE, and IFR. The results obtained from the analysis performed for the research data that span from 1985 to 2021 showed that the an ARDL (1, 3, 0, 0) model was selected as the best model by the Akaike's information criterion. The plotted CUSUM Square line showed that the model parameter estimates are unstable during the period of 1985 to 2021. At 5% significance there is a huge effect on the first lags of UPR and FDI on UPR, while IFR, GOE were not significant. Therefore, the selected model indicates that the present UPR would quiet upset the rate of UPR in the subsequent one year and also FDI would quite upset UPR in the next one year. Based on the ARDL selected models, Bounds test was performed to help plaid for the existence of cointegration in the selected ARDL model. The Bounds test showed that UPR, FDI, GOE, and IFR are cointegrated. The result implies that a long run bond exists amid UPR versus FDI, UPR versus IFR.

To capture the speed of adjustment of UPR and the explanatory variables (FDI, GOE, and IFR) considered, ECM was fitted to the data. It was found from the fitted error correction model, $ECM_{t-1}$ that the coefficient is negative and highly significant at 5% and this shows how speedily the variables converge to steadiness. This further confirms the actuality of a stable long-run relationship among the factors with their several significant slacks. The coefficient of EC1 = -1.2005, point toward deviation from the long run on FDI is modified by 120% in the next one year. In the short run, the current FDI is negative but insignificant at 5% and this implies that a variation in the current FDI will lead to an insignificant 4.67% corresponding change in UPR. But the FDI at lag one is significant at 5% and produced a positive coefficient which implies that a unit increase in FDI at lag one will lead to a corresponding increase in UPR by 7.23% and variation at lag two of the FDI will result to an insignificant 4.02% decrease in UPR. The ECM indicates that the estimated coefficient of the lag value of the residual ($ECM_{t-1}$) is -1.2005 which is negative and significant at 5%.

## CONCLUSION

This research has empirically determined the relationship between Nigeria unemployment rate with foreign direct investment, government expenditure, and inflation rate. The findings from the application of ARDL modeling showed that only FDI has a significant long run impact of reducing UPR in the country. In the short run a mixed result was obtained at the current FDI, lag one FDI, and lag two FDI. This was clearly depicted by the CUSUM chart which showed instability in the estimated parameter for the study period of 1985 to 2021. However, it is recommended that in making policies to reduce unemployment rate in the country, current and previous FDI should be considered as an important factor among other macroeconomic variables not included in this study. However, the bounds test showed evidence of cointegration between UPR and FDI, GOE, and IFR which means the model which has all these variables is selected.

## REFERENCES

Agog, N. S., Bako, S. S., David, I. J., Peter, M., & Yahaya, J. K. (2021). Modeling Nigeria's Unemployment Rates: Box-Jenkins Approach. *KASU Journal of Mathematical Sciences*, *2*(1), 28-25.

Akeju, K. F. & Olanipeun, D. B. (2014). Unemployment and economic growth in Nigeria. *Journal of Economics and Sustainable Development*, *5*(4), 138-154.

Alhdiy, F. M., Johari, F., Faud, S. N. M., & Rahman, A. A. (2015). Short and long term relationship between economic growth and unemployment in Egypt: An empirical analysis. *Mediterranean Journal of Social Sciences*, *6*(4), 454-554.

David, I. J., Nnamdi, S. K., & Bamigbala, O. A. (2024). ARDL Inference for Some Macroeconomic Variables on Nigeria Stock Prices. *WSB Journal of Business and Finance 58*(1), 15-32.

David, I. J., Bamigbala, O. A. Adubisi, D. O., Danjuma, I., Agog, N. S., & Ikwuoche, P. O. (2023). Bonds Testing of Exchange Rate Effect on Economic Growth. *Journal of Mathematics and Statistics Research, 5*(1), https://doi.org/10.36266/JMSR/162

David, I. J., & Idi, D. (2024). Inference from Modelling FDI and Unemployment Rate in Nigeria. *Asian Journal of Science, Technology, Engineering, and Art, 2*(4), 566-578. https://doi.org/10.58578/ajstea.v2i4.3444

Egwuatu, O. W. (2021). Liquidity preference as behavior towards risk. *Review of Economic Studies*, *2*(5), 65-86.

Farouk, B. U. K., David, I. J., & Agog, N. S. (2021a) Interest Rates and Nigeria Economic Growth Nexus: ARDL Bonds Test Technique. *Journal of Research in Business and Management, 9*(8), 47-52.

Farouk, B. U. K., David, I. J., & Agog, N. S. (2021a) Inflationary Effect on Nigeria Economic Growth: The ARDL Bond Test Approach. *Journal of Economics, Management and Trade, 27*(6), 25-36.

Narayan, P. K. (2005). The saving and investment nexus for China: evidence from Cointegration tests. *Applied Economics*, *37*(17), 1979-1990.

Pesaran, M. H., Shin, Y. & Smith, R. J. (2001). Bounds testing approaches to the analysis of Level relationship. *Journal of Applied Econometrics*, *16*(3), 289–326.

Pesaran, M. H., & Shin, Y. (1999). An autoregressive distributed lag modelling approach to

cointegration analysis. In: Strom, S. (Ed.), *Econometrics and Economic Theory in 20th Century: The Ragnar Frisch Centennial Symposium*. Cambridge University Press, Cambridge.

Philip, A. A., Samson, A. J., & Ogwu, I. P. (2013). Strategy for reducing unemployment in Nigeria. *International Journal of Capacity Building in Education and Management*, *2*(1), 32-44.

Yelwa, M., David, O. O. K. & Omoniyi, A. E. (2015). Analysis of the relationship between inflation, unemployment and economic growth in Nigeria: 1987-2012. *Applied Economics and Finance, 2*(3), 02-09.