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FOREIGN INVESTMENT INFLOW AND UNEMPLOYMENT RATE IN A DEVELOPING ECONOMY: TIME SERIES EVIDENCE FROM NIGERIA

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Abstract

Unemployment causes emotional trauma and feelings of low self-esteem; hence the need to tackle the high rate of unemployment in Nigeria prompted this study to investigate whether foreign investment inflows, in the form of foreign direct investment (FDI) and foreign portfolio investment (FPI), have any effect on unemployment rate in the country. We used annual time series data for the period 37-year period from 1986 to 2022. Preliminary stationarity test using Augmented Dickey-Fuller, Phillips Perron, and Zivot-Andrews unit root tests indicate that the dataset employed in the study is a mixture of order zero and order one integrations. The autoregressive distributed lag (ARDL) Bounds test results indicate that the variables have a long-run relationship. The study finds that FDI and FPI each has a significant negative impact on unemployment rate in the long run with regression coefficients -0.85 and -0.99 percent respectively. On the evidence of the findings, the study concludes that the growth of foreign direct investment and foreign portfolio investment inflows tend to curb the unemployment rate in Nigeria given a stable macroeconomic environment in the country. The federal government of Nigeria should therefore target bilateral trade policies that encourage the attraction, retention, and leveraging of foreign direct investment for job creation. The Nigerian government through its Central Bank and the Securities and Exchange Commission, should also seek to attract more foreign portfolio investment.

Keywords: Emotional trauma, Foreign direct investment, Foreign portfolio investment, Unemployment rate.

1. INTRODUCTION

With a rapidly growing labour force, job creation is important to combat unemployment in Nigeria. Investments are a channel through which jobs are created to boost employment in a country and as a developing one, Nigeria welcomes inflows of foreign investments. In this study, two kinds of foreign investments are considered: direct investment and portfolio investment. International Monetary Funds (2007) noted that foreign direct investment (FDI) is net inflow of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. The source under reference further stated that FDI can take the form of equity capital, reinvestment of earnings, other long-term capital, and short-term capital, as stated in the balance of payments of the host country. On the other hand, foreign portfolio investment (FPI) covers transactions in equity securities and debt securities; that is, investments made by foreigners through the Nigerian stock exchange market, to acquire shares of public limited liability companies or debt instruments of the Nigerian government, as the case may be.

Arguments in favour of FDI abound. It can help to grow the economy of the host country and in the process create more jobs (Ozughalu & Ogwumike, 2013); it can raise productivity to a given amount of labour allowing a large labour force to be employed (Egbo, 2012); and it results in positive externalities such as transfer of technology, increased domestic competition

and supplementing domestic investment (Ayanwale, 2007). However, FDI can also reduce employment through disinvestment and the closure of domestic firms because of intense competition (Pinn et al., 2011; Jenkins, 2006).

Despite the mixed expectations from foreign investment inflow, the Nigerian government has since the early 1980s sought to attract more inflow of foreign investment. Since the dawn of the 21st century, the government has deliberately implemented incentive policies and regulatory measures aimed at promoting the inflow of foreign investments into the country (Onu, 2012). The need to curb the soaring unemployment rate in Nigeria has necessitated the Nigerian government to encourage private-sector initiatives. It has therefore formulated and implemented policies and programmes that were geared towards creating a conducive climate that encouraged private-sector initiatives or those that are meant to woo foreign investors outright. For instance, early in 1986, the Nigerian government implemented a structural adjustment programme (SAP) of which deregulation of the financial system was a part, and that paved the way for foreigners to invest in Nigerian companies resulting in an inflow of equity capital and equity securities.

In 1995, the Nigeria Investment Promotion Commission (NIPC) succeeded the Industrial Coordination Committee (IDCC) which was established to attract foreign investors so as to boost FDI inflow into the country (UNCTAD, 2009). The New Partnership for Africa's Development (NEPAD) followed in 2001 with the attraction of foreign investment to Africa as one of the key objectives. Also, the National Economic Empowerment and Development Strategy (NEEDS) was implemented between 2003 and 2007 and it partly targeted more inflow of foreign investment into the country with the goal of employment creation.

Evidently, data from CBN (2021) suggest that FDI inflow into Nigeria increased 91% from 735.8 million naira in 1986 to 1.36 trillion naira in 2022. Within this period, there was an average annual growth of 54.6%. Similarly, FPI inflow had risen in value in 2022 compared to 1986, averaging 51.2% in growth rate, per annum, within the two periods. Within the same period, foreign remittance inflow rose from 4.0 billion naira to 2.01 trillion naira, with 81.2% annual growth rate, on the average. But whether the growing trend of FDI and FPI inflows into the country has impacted well on the rate of unemployment remains largely debatable. According to National Bureau of Statistics (2022), unemployment rate in Nigeria averaged 15.01% of the labour force per annum over the 36-year period 1986-2021. Although it dropped to 3.5% in 1990 from 5.3% in 1986, it increased to 18.8% by the end of year 2000. By the end of the next decade, it had risen by 18.2% to 21.4% of total labour force. However, it had jumped to 37.7% by the end of 2022. It is against this backdrop that the current study reappraises the impact of foreign investment inflows on unemployment rate in Nigeria focusing on the period 1986-2022.

The national efforts may have collectively accounted for the increased inflow of foreign investments into Nigeria over the thirty-seven-year period under review in this study. However, this has apparently not translated to unemployment reduction in the country. Evidently, the increased inflow of foreign capital has not found its way to critical sectors of the economy due to bureaucratic bottlenecks which also hinder the efficiency of the Nigerian capital market. The increased inflow of foreign capital seems not to have raised the level of economic activities, and in the process, create jobs and reduce unemployment rate in the country considering that unemployment rate was 5.3% of total labour force in 1986 but rose to 21.4% in 2010 and then peaked at 37.7% in 2022.

In fact, unemployment rate in 2021 was 64% up from its level in 2010. The data appear to suggest that unemployment rate trended upwards within the same period that foreign investment inflows surged which raises the question of whether foreign investments in Nigeria has led to unemployment reduction.

Granted, a general consensus is lacking as to whether FDI or FPI inflow has a favourable impact on unemployment reduction in the host country. Recent studies in Nigeria have particularly produced mixed results: no significant impact of FDI on the employment rate (see Aladelusi & Olayiwola, 2021; Abaukaka, 2014); negative impact (see Adeyemi et al., 2020); and positive impact (see Osabohien et al., 2020; Babasanya, 2018; Oluwatoyin & Ogunlusi; 2017). However, those studies addressed the issue of unemployment indirectly, as well as left out an important component of foreign investment in Nigeria, namely, foreign portfolio investment (FPI) and private remittances. The present study is an attempt to close the perceived gap in the literature.

The general objective of this study is to investigate whether foreign investment inflows are leading to reduction of unemployment rate in Nigeria. Specifically, we determined (i) whether foreign direct investment (FDI) inflow into Nigeria has a significant impact on the country's unemployment rate; and (ii) ascertained the extent to which FPI inflow into Nigeria has impacted on unemployment rate in the country.

The findings of this study can guide the government of Nigeria and its agencies, such as the Nigeria Investment Promotion Commission (NIPC) and the New Partnership for Africa's Development (NEPAD), or even the Securities and Exchange Commission (SEC), in formulating, implementing, or adjusting policy actions towards making foreign investment inflows more efficient in the country. Future researchers can also benefit from the findings of the study in that the latter can serve as a basis for evaluating the results of their own studies.

2.0 REVIEW OF RELATED LITERATURE

2.1 Conceptual review

2.1.1 Foreign direct investment

Foreign direct investment (FDI) refers to that made to acquire lasting management of about 10 per cent of voting stock in a business operating in a country other than that of the investor defined according to residency (World Bank, 1996). This is an institutional definition from which scholars have adapted their definitions. To Shenkar (2007), FDI is the outlay of money towards the acquisition of real or physical assets, such as factories and distribution facilities. This definition differs from the first in that it associates FDI with the acquisition of assets.

In the view of André (2008), FDI is one made to acquire lasting interest in enterprises operating abroad. The details of that definition are similar to the institutional definition mentioned earlier with respect to the source and size of FDI. In summary, the few definitions reviewed show that most scholarly definitions of FDI align closely with the institutional definition by World Bank. For this reason, the present study adopts the said institutional definition of FDI.

2.1.2 Foreign portfolio investment

Foreign portfolio investment (FPI) refers to that in foreign financial instruments such as government bonds, mutual funds, and foreign stocks (Shenkar, 2007). Thus, FPI is investment in financial instruments abroad, as opposed to investment in tangible asset, which is FDI.

Similarly, Matthew and Ogunlusi (2017) posit that FPI comprises of securities and various financial assets inactively held in one country by foreign investors. As contained in this definition (and indeed in various other definitions), financial asset is the object of FPI, and they include, but not limited to, bonds, stocks, mutual funds, exchange traded funds, and cash equivalents. More recently, Oyekanmi (2021) defines FPI as purchase of securities and other financial assets by investors from another country; adding that the securities or financial assets could be held directly by the investor(s) or managed by professionals appointed by them. This definition, like the others before it, roots FDI in financial assets as outlined earlier. For simplicity, CBN (2021) classified the financial assets, or instruments, into equity securities and debt securities – the former representing investment in stocks of corporate entities and the latter government bonds. From the various definitions reviewed, it appears that the concept of FPI is less contentious than its counterpart, FDI, in terms of what constitutes them.

2.1.3 Unemployment/unemployment rate

The Organisation for Economic Co-operation and Development (OECD, 2020), defines unemployment as a situation in which people above a specified age (usually 15 years) are not in paid employment or self-employment but currently available for work during the reference period. The International Labour Organization (ILO, 2008), however clearly specifies the age range as 15-64 years. The Nigeria National Bureau of Statistics (NBS) uses a variant of the ILO definition, so it defines the unemployed as “one who did absolutely nothing at all or did something but for less than 20 hours during the reference period” (NBS, 2021).

In summary, unemployment technically is the opposite of employment or not having a job. In the economic sense, Abaukaka (2014) defines the concept as a situation whereby able-bodied men and women who are qualified by the condition to work in any given society are unable to secure jobs. This definition implies that unemployment is a state of not being gainfully engaged in any economic activity.

Unemployment is measured by the unemployment rate, which is the number of people who are unemployed as a percentage of the labour force (the total number of people employed plus those unemployed) (OECD, 2020; NBS, 2021). Thus, the unemployment rate is the percentage of the labour force without a job.

2.2 Theoretical framework

2.2.1 The foreign direct investment (FDI) spillover theories

The theories of FDI spill-overs are associated with Blomstrom (1989). There are horizontal and vertical spillovers, the former taking place when domestic firms benefit from the presence of foreign firms within their sector and the latter when benefits arise in both upstream and downstream production chains within other industries outside the one receiving the foreign investment (Javorcik, 2004). Relevant to this study are the positive spillovers associated with human capital development which obtains within the horizontal spillover.

There are three aspects of the horizontal spillover: demonstration, competition, and labour turnover (Harrison & Aitken, 1999). Of interest to the present study is the latter. It occurs when workers previously employed by multinational enterprise (MNE) affiliates equipped with advanced technical, managerial, and other soft skills, move to work for a local firm or set up their own businesses (Fosfuri, Motta, & Ronde, 2001). In this way, some original knowledge rooted in some MNE affiliates is transferred to domestic enterprises, which may eventually benefit the local industry (Harrison & Aitken, 1999).

In review, the essence of the theory is that FDI results in posare obtaineditive labour turnover and this occurs when workers who previously worked for the local subsidiaries of an MNE are

able to transfer some of the foreign technology to local competitors or outrightly start up their own firms. Either way, the local firms would expand due to their products being more appealing to the market and that can lead to job creation evidenced by an increase in the employment rate. However, foreign investors are aware of this development so they often employ restrictive measures to avert it. For instance, foreign affiliates can recruit highly talented employees from domestic firms and make them comfortable to avert possible labour turnover, leaving local competitors facing a brain drain. This would likely stifle, rather than create, employment.

2.2.2 Labour demand theory

The labour demand theory states that the aggregate demand for labour is assumed to be negatively related to real wages and positively related to output (Keynes, 1936). Demand for labour is a derived demand in the sense that it arises due to the demand for goods and services which labour helps to produce. By labour demand, it means the quantity of labour that employers seek to hire during a given period at a particular wage rate (Sapsford, & Tzannatos, 1993). To explain the aggregate demand function, previous studies have used a neoclassical framework for the formulation of the demand for labour schedule (Adeyemi et al., 2020).

The labour demand theory forms the theoretical framework for the present study because it connects labour demand with a variety of economic factors such as wages, output level, and more importantly, investment. Foreign investors often leverage on labour supply in the target host country. As such, their business activities in the host country may lead to creation of new job opportunities directly or indirectly. The same can be said of foreign portfolio investment, whether in equity or bond. It tends to increase the volume of capital available to local firms who may leverage on that to either expand the volume of their existing businesses or establish new ones outright. Either way, more jobs are created to reduce the unemployment rate in the host economy.

2.3 Empirical evidence

At the international stage, Suyunov (2021) investigated the connection among credit to the economy, FDI, and unemployment rate in Uzbekistan focusing on the period 2004-2019 and using a vector autoregression (VAR) model. The results indicate that both growth in credit to the economy and FDI Granger cause a change in the unemployment rate, and that 1% positive shock to FDI growth increases the unemployment rate by 0.0036%. However, the study omitted the impact of foreign portfolio investment which is where the present study comes in.

The study by Alkofahi (2020) examined the impact of foreign direct investment on the unemployment rate in the Kingdom of Saudi Arabia (KSA) over the period 2005-2018 using Ordinary Least Square (OLS) method. It found that FDI inflow has a significant negative effect on the country's unemployment rate implying that FDI inflow reduces the unemployment rate. But then, the study omitted the influence of FPI which opens up a gap in the literature. The study by Alalawneh and Nessa (2020) investigated the impact of FDI on various forms of unemployment in six countries in the Middle East and North Africa (Egypt, Jordan, Lebanon, Morocco, Tunisia, & Turkey) with panel data for the period 1990-2018 estimated using the VAR method. The results showed that FDI reduces the unemployment rate, the male unemployment rate, and the female unemployment rate in the long run. This present study differs by using the total unemployment rate and including FPI.

Widia, Ridwan, and Muharja (2019) examined the opportunities for employment creation by FDI in countries in the Association of Southeast Asian Nations (ASEAN), namely, Indonesia, Singapore, Malaysia, and Thailand. Data used covered the period 1980-2017 and the authors

used vector error correction model (VECM) and found that FDI inflow reduces unemployment rate but only in the long run. In contrast, the present study is country-specific.

Irpan et al. (2016) focus on the impact of FDI on unemployment rate in Malaysia over the period 1980-2012. The study also included other factors such as the number of foreign workers, GDP, and exchange rate and used ARDL method of analysis. The authors find that FDI has significant negative influence on the country's unemployment rate. On the other hand, Djambaska and Lozanoska (2015) found no significant impact of FDI on unemployment rate in Macedonia for the period 1999-2013. However, the studies did not include FPI.

On the domestic scene, Aladelusi and Olayiwola (2021) investigated the impact of FDI on employment creation in Nigeria for the 35-year period of 1985-2019. The study used cointegration method and found that positive relationship exists between employment rate and FDI, but it is statistically insignificant at the 5% level. Unlike the present study, this study used employment rate which is not much of a problem in Nigeria. Also, the authors did not include foreign portfolio investment as an explanatory variable in their study.

The study by Adeyemi et al. (2020) investigated the role of FDI on employment generation in Nigeria. The authors employed multiple regression, Johansen co-integration and causality test to analyse the data using Stata-12. The result of the study suggests that FDI has a significant negative impact on employment rate. However, the authors did not indicate the scope of the study to facilitate comparison with previous or future studies, and foreign portfolio investment was excluded from the study too. Also, the authors used too many explanatory variables which may have accounted for the insignificant impact of the main explanatory variable.

The study by Osabohien et al. (2020) examined the relationship between FDI and the level of employment in Nigeria in the period 1985-2017. The article used the Fully Modified Ordinary Least Squares (FMOLS) and the Johansen co-integration methods. FDI is found to be statistically significant and positively related to employment rate. However, the study excluded foreign portfolio investment in the model.

Oloruntuyi (2020) studied the impact of FDI on unemployment rate (UNR) in Nigeria over the 33-year period 1986-2018 using the ARD and VAR methods. The study revealed that FDI has significant negative effect on UNR in Nigeria in both the short and long runs but no causal relationship between them. However, the use of the VAR in the study is unsubstantiated. The present study differs by using a longer scope and different control variables.

Ajayi, Akano, and Adams (2019) studied the impact of FDI on the employment and unemployment rate in Nigeria over the 55-year period 1960-2014 using vector autoregression (VAR) method. The authors find that lag 1 of FDI has negative impact on employment rate while lag 2 has a positive impact; and that FDI has no significant immediate impact on unemployment rate. However, the authors excluded FPI in their study.

The study by Johnny et al. (2018) reviewed the impact of FDI on unemployment rate in Nigeria over the 36-year period of 1980-2015 using the error correction mechanism (ECM). The study revealed that FDI has negative and insignificant relationship with unemployment rate in the country but a positive and significant relationship between capital formation and unemployment rate. We noticed an obvious methodological flaw in the study: the authors used the ECM rather than the VECM since there are 3 cointegrating equations from the Johansen cointegration test. Little wonder the ECM coefficient is -1.21 which is incorrect.

The study by Oloruntuyi (2020) interrogated the impact of FPI on unemployment rate in Nigeria over the period 1986-2018. Other variables used are GDP, exchange rate, and inflation rate. The author used the ARDL method and found that FPI has significant negative impact on unemployment rate in the country. However, the regression coefficient is astronomically huge as the result shows that unemployment rate falls by as much as 17% per annum in the short run, in response to 1% growth in FPI inflow. This is because the author did not standardize the data prior to running the analysis, which casts doubt on the entire result.

In their study, Elekwa, Aniebo, and Ogu (2016) explored non-traditional variables that can influence employment growth in Nigeria within the period 1980-2014. The variables of interest in that study are FPI, real GDP, domestic investment, real interest rate, inflation rate, real exchange rate, and labour force participation rate. The study used a single equation, and a reduced form specification and found that in the long term, FPI has significant impact on employment growth. However, the study did not directly address the unemployment impact of foreign portfolio investment, neither is FDI included in the study.

Albulescu (2015) did a panel study on the impact of foreign investment (FDI & FPI) on the host country economic growth in Central and Eastern European (CEE) countries over the period 2005-2012. The author used data for 13 CEE countries and a system-GMM approach and found that both direct and portfolio investments exert an influence on the long-term economic growth. Clearly, the present study differs by using unemployment rate, rather than GDP, as the dependent variable, in addition to being a country-specific (not panel) study.

Rather than use unemployment rate, the studies by Mbanefo (2022) and Akpokerere and Ighoroje (2020) assess the effect of FPI on human capital development in Nigeria, while that of Ezeanyej and Ifeako (2019) is on the growth impact of FPI in the Nigerian economy instead.

The review has shown that previous studies on the subject focused on the impact of FDI on employment generation in Nigeria using employment rate as the dependent variable (see Aladelusi & Olayiwola, 2021; Adeyemi et al., 2020; Osabohien et al., 2020; Babasanya, 2018; Oluwatoyin & Ogunlusi, 2017), rather than unemployment rate. This study argues that high unemployment rate, rather than low employment rate, is the real problem of Nigeria. The previous studies also excluded foreign portfolio investment and foreign remittance inflow which are critical components of foreign investment inflow into the country. We also discovered that the previous studies did not use newer methods of analysis such as the Kernel-based regularized least squares method (KRLS) which accounts for the issue of functional form of the model (Hainmueller & Hazlett, 2014). The present study therefore adds to the literature by incorporating the identified improvements.

3. METHODOLOGY

3.1 Research design

This study uses the ex post facto research design because the phenomenon being studied has already taken place prior to the time of conducting the study. As such, the researcher relied on already published data to carry out the cause-and-effect investigation into the impact of foreign investment inflows on unemployment rate in Nigeria over the period 1986-2022. The study employs regression analysis to analyse the data using EViews 12 and STATA 16.

3.2 Model specification

The model of this study is rooted in the labour demand theory by Keynes which states that the aggregate demand for labour is assumed to be negatively related to real wages and positively

related to output, which in turn is a function of investment (Keynes, 1936). Based on this premise, Massoud (2008) opined that the demand for labour is affected by several variables including investment, technology, and the macroeconomic environment of the country.

The building of the model showing the impact of foreign investment inflows on unemployment rate is based on the assumption that where it generates and expands businesses, foreign investments can help to lower the unemployment rate (Zeqiri, Bytyqi, & Likaj, 2011). Thus, foreign investment inflows can be a factor to determine the level of unemployment in the host economy, while also taking into account necessary control variables such as inflation rate, as in Elekwa, Aniebo, and Ogu (2016). Assuming that the dependent and independent variables are linearly related, the relationship can therefore be represented quantitatively as follows,

$$\text{UNR} = f(\text{FDI}, \text{FPI}, \text{REM}, \text{GDP}, \text{INF}) \quad 1$$

Where, UNR is total unemployment rate, FDI is foreign direct investment inflow, FPI is foreign portfolio investment inflow, REM is Private remittances inflow, GDP is Gross domestic product, and INF is inflation rate measured as percentage change in the consumer price index. According to Shahbaz and Lean (2012), specifying a model in a log-linear form increases the efficiency and reliability of empirical evidence provided by the model comparative to a standard linear specification. The study therefore uses a semi-log model and the explicit form is specified as,

$$\text{UNR}_t = \alpha_0 + \alpha_1 \ln \text{FDI}_t + \alpha_2 \ln \text{FPI}_t + \alpha_3 \ln \text{REM}_t + \alpha_4 \ln \text{GDP}_t + \alpha_5 \ln \text{INF}_t + \mu_t \quad 2$$

where, \ln is the natural log of the observed or nominal value, α_0 is the intercept of the linear model or the constant term, $\alpha_1 - \alpha_5$ are the regression coefficients of the independent variables, t stands for time (current year), and μ is a set of random values representing the regression residuals. In Equation 2, α_1 , α_2 , α_3 are expected to be negative if the inflow of foreign investment created positive labour turnover effect that acts to reduce the unemployment rate, respectively. α_4 is also expected to be negative because economic growth should ideally lower unemployment rate. On the other hand, α_5 is expected to be positive, since rise in inflation rate is associated with rise in unemployment rate because aggregate demand, and then investment, would fall, holding other factors constant.

3.3 Data discussion

- (i) **Unemployment rate:** Is the ratio of total number of unemployed persons to the labour force expressed in percentage. In this study, the final data used for analysis are the natural log values of the national unemployment rates in Nigeria.
- (ii) **Foreign Direct Investment (FDI):** The original data collected are in millions of Naira but the final data used are converted into indices using the natural log function.
- (iii) **Foreign Portfolio Investment (FPI):** Portfolio investment covers transactions in equity securities and debt securities. Original data are in millions of Nigeria Naira but the final data used were converted into indices or growth rates using the natural log function.
- (iv) **Inflation rate (INF):** Is measured as the percentage change in consumer price index. The final data used is the natural log of the original inflation rates.

3.4 Estimation procedure

The estimation begins with an individual unit root test to ascertain the stationarity properties of the variables that entered the model and this was done using both the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) methods. The results from this step informed the use

of the autoregressive distributed lag (ARDL) method to estimate the study model, details in the next section. Lastly, diagnostic tests such as autocorrelation, normality of the regression residual, heteroskedasticity, and stability tests, were carried out to determine the robustness of the results of the estimated model.

3.5 Sources of data

The unemployment rate data were obtained from periodic publications of the Nigeria National Bureau of Statistics (NBS) for various years. The FDI, FPI, and INF rate data were obtained from the Statistical Bulletin of the Central Bank of Nigeria of 2021, available at: <https://www.cbn.gov.ng/documents/Statbulletin.asp>.

4. RESULTS

4.1 Preliminary results

4.1.1 Descriptive statistics of the study variables

Table 1: Descriptive statistics

| Statistic | UNR | FDI | FPI | REM | GDP | INF |
|------------------|------------|------------|------------|------------|------------|------------|
| Mean | 15.62486 | 451626.6 | 437691.2 | 9.96E+09 | 40463.72 | 19.42657 |
| Median | 13.70000 | 248224.6 | 70938.49 | 2.27E+09 | 35020.55 | 12.87658 |
| Maximum | 37.70000 | 1360308. | 2687233. | 2.43E+10 | 74639.47 | 72.83550 |
| Minimum | 2.000000 | 735.8000 | 151.6000 | 2424527. | 15237.99 | 5.388008 |
| Std. Dev. | 10.29862 | 451936.0 | 732539.8 | 9.89E+09 | 21453.12 | 17.32918 |
| Skewness | 0.390206 | 0.652419 | 2.034956 | 0.125350 | 0.335743 | 1.764580 |
| Kurtosis | 2.047594 | 2.033976 | 6.113821 | 1.121723 | 1.470308 | 4.837085 |
| Jarque-Bera | 2.337353 | 4.063531 | 40.48427 | 5.535781 | 4.302561 | 24.40435 |
| Probability | 0.310778 | 0.131104 | 0.000000 | 0.062794 | 0.116335 | 0.000005 |
| Sum | 578.1200 | 16710186 | 16194573 | 3.69E+11 | 1497158. | 718.7832 |
| Sum Sq. | | | | | | |
| Dev. | 3818.213 | 7.35E+12 | 1.93E+13 | 3.52E+21 | 1.66E+10 | 10810.82 |
| Observations | 37 | 37 | 37 | 37 | 37 | 37 |

Source: Author's computation, 2024, from EViews 12

The result in Table 1 shows the descriptive statistics of the study data which gives an overview of the data. The mean is the average value of the variable over the period 1986-2022. For example, UNR averaged 15.6% per year over the period, while INF averaged 19.4% per year in the period. Other common statistics shown include median, minimum, and maximum, and the standard deviation. The Skewness, Kurtosis, Jarque-Bera are all measures of distribution. For instance, the probability values of the Jarque-Bera statistics are above 0.05 for UNR, FDI, REM, and GDP, which means that the data are normally distributed.

4.1.2 Unit root test results

We conducted stationarity tests using three methods: the Augmented Dickey-Fuller (ADF) test, the Phillips-Perron (PP) test, and the Zivot-Andrews method, as presented below.

Table 2: Summary of Augmented Dickey Fuller (ADF) unit root test results

| Variable | ADF Test Statistic @ Level | 5% critical value | P-value | ADF Test Statistic @ 1 st Difference | 5% critical value | P-value | Order of Integration |
|----------|----------------------------|-------------------|---------|---|-------------------|---------|----------------------|
| UNR | 0.007 | -2.969 | 0.9591 | -5.403 | -2.972 | 0.0000 | I(1) |
| lnFDI | -2.604 | -2.969 | 0.0921 | -7.829 | -2.972 | 0.0000 | I(1) |
| lnFPI | -2.122 | -2.969 | 0.2357 | -6.958 | -2.972 | 0.0000 | I(1) |
| lnREM | -2.028 | -2.969 | 0.2746 | -6.730 | -2.972 | 0.0000 | I(1) |
| lnGDP | -0.661 | -2.969 | 0.8566 | -3.292 | -2.972 | 0.0152 | I(1) |
| INF | -2.859 | -2.969 | 0.0504 | - | - | - | I(0) |

Source: Researcher's computation, 2024, from STATA 16

The result in Table 2 indicates that inflation rate (INF) is integrated of order zero, whereas the rest of the variables are integrated of order one, based on the ADF method. To confirm the results, we conducted a second and a third unit root tests, as indicated below.

Table 3: Summary of Phillips-Perron (PP) unit root test results

| Variable | Z(t) test Statistic @ Level | 5% critical value | P-value | Z(t) test Statistic @ 1 st Difference | 5% critical value | P-value | Order of Integration |
|----------|-----------------------------|-------------------|---------|--|-------------------|---------|----------------------|
| UNR | 0.117 | -2.969 | 0.9672 | -5.378 | -2.992 | 0.000 | I(1) |
| lnFDI | -3.077 | -2.969 | 0.0283 | - | - | - | I(0) |
| lnFPI | -1.872 | -2.969 | 0.3454 | -9.140 | -2.972 | 0.000 | I(1) |
| lnREM | -2.212 | -2.969 | 0.2021 | -6.690 | -2.972 | 0.000 | I(1) |
| lnGDP | -0.604 | -2.969 | 0.8701 | -3.381 | -2.972 | 0.012 | I(1) |
| INF | -2.906 | -2.969 | 0.0447 | - | - | - | I(0) |

Source: Researcher's computation, 2024, from STATA 16

The Phillips-Perron unit root test result in Table 3 confirms the ADF result in Table 2 that UNR, lnAFPI, lnREM, lnGDP, and INF, however lnFDI is integrated of order zero rather than order one as in the ADF method. We further applied the Zivot-Andrews unit root test and obtained the following result.

Table 4: Summary of Zivot-Andrews (ZA) unit root test results

| Variable | Minimum t-statistic @ Level | 5% critical value | Minimum t-statistic @ 1 st Difference | 5% critical value | Order of Integration |
|----------|-----------------------------|-------------------|--|-------------------|----------------------|
| UNR | -2.974 | -4.80 | -5.983 | -4.80 | I(1) |
| lnFDI | -3.628 | -4.80 | -4.969 | -4.80 | I(1) |
| lnFPI | -5.645 | -4.80 | - | - | I(0) |
| lnREM | -2.545 | -4.80 | -7.848 | -4.80 | I(1) |
| lnGDP | -2.839 | -4.80 | -5.674 | -4.80 | I(1) |
| INF | -6.730 | -4.80 | - | - | I(0) |

Source: Researcher's computation, 2024, from STATA 16

The Zivot-Andrews unit root test result in Table 4 shows that lnFPI is integrated of order zero, whereas the ADF and the PP methods indicated that this variable is integrated of order one. The results for UNR, lnREM, lnGDP, and INF from the Zivot-Andrews test confirms those of

the two other methods in mention. All three methods indicate mixed orders of integration which implies that the autoregressive distributed lag (ARDL) method may be used.

4.2 Results of model analysis

4.2.1 Optimum lag-length selection criteria result

The optimum lag length for the ARDL estimation was determined using the vector autoregression (VAR) lag order selection criteria which we have shown in Table 4.

Table 5: Lag Selection-order criteria

| lag | LL | LR | df | p | FPE | AIC | HQIC |
|-----|----------|---------|----|-------|----------|----------|----------|
| 0 | -377.573 | | | | 502.541 | 23.2468 | 23.3384 |
| 1 | -213.792 | 327.56 | 36 | 0.000 | .226393 | 15.5025 | 16.1434 |
| 2 | -170.659 | 86.265 | 36 | 0.000 | .185105 | 15.0703 | 16.2604 |
| 3 | -132.353 | 76.612 | 36 | 0.000 | .322151 | 14.9305 | 16.67 |
| 4 | 1.82887 | 268.36* | 36 | 0.000 | .005237* | 8.98007* | 11.2688* |

Endogenous: unr lnfdi lnfpi lnrem lngdp inf

Source: Author's computation, 2024, from STATA 16

As shown in Table 5, the majority of the criteria recommended 4 lags. We followed the Akaike information criteria (AIC) nonetheless.

4.2.2 ARDL Short-run (error correction) result

We abstracted the short-run equation of unemployment rate from the result obtained as,

UNR = -292.90 -0.253L1.UNR -0.974D1.FDI -0.400D1.FPI +0.022D1.REM +8.001D1.GDP +0.034D1.INF

[t = -2.05 -2.75*** -2.28** -2.19** 0.02' 2.05** 2.89***]**

Sig. @ 0.05, *Sig. @ 0.1, 'Not significant

Source: Author's computation from STATA 16, 2024, from STATA 16

The results indicate that a one percent increase in the value of foreign direct investment (FDI) and foreign portfolio investment (FPI) inflow into Nigeria would reduce unemployment rate by -0.974 and -0.4 percentage points in the short run, respectively. Growth of remittance inflow has no significant effect on unemployment rate in the short run, but a percentage economic growth and inflation surge significantly pushes the unemployment rate upward by 8.0% and

0.034%, respectively, everything else remaining the same. The short-run model has a speed of adjustment of 25% per annum towards long-run equilibrium, ceteris paribus.

4.2.3 Long-run results

We obtained the following long-run equation of unemployment rate from the estimated result, $UNR = -0.852L1.lnFDI - 0.986L1.lnFPI + 0.939L1.lnREM - 0.6491L1.lnGDP - 0.134L1.INF$

[t = -3.79*** -2.23** 0.91' -2.85*** -0.086']

Sig. @ 0.05, *Sig. @ 0.1, 'Not significant

Source: Author's computation, 2024, from STATA 16

The results indicate that a one percent increase in the value of foreign direct investment (FDI) and foreign portfolio investment (FPI) inflows into Nigeria would significantly reduce unemployment rate by -0.85 and -0.99 percentage points in the long run, respectively. Growth of remittances inflow still has no significant effect on long-run unemployment rate, but a 1% GDP growth significantly pushes the unemployment rate upward by 0.65% in the long run, whereas inflation rate appears to have no meaningful impact on unemployment rate in the long run, ceteris paribus.

4.2.4 ARDL Bounds test result

The study tested for long-run relationship among the study variables using the ARDL Bounds test and obtained the result presented in Table 6.

Table 6: ARDL Bounds test result

| Pesaran, Shin, and Smith (2001) bounds test | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|---------|
| H0: no level relationship | | | | | | | |
| F = | | | | | | | |
| 4.478 | | | | | | | |
| Case 2 | | | | | | | |
| t = | | | | | | | |
| -3.754 | | | | | | | |
| Finite sample (5 variables, 35 observations, 3 short-run coefficients) | | | | | | | |
| Kripfganz and Schneider (2020) critical values and approximate p-values | | | | | | | |
| | 10% | | 5% | | 1% | | p-value |
| | I(0) | I(1) | I(0) | I(1) | I(0) | I(1) | |
| I(0) | I(1) | | | | | | |
| F | 2.362 | 3.509 | 2.851 | 4.159 | 4.051 | 5.745 | |
| 0.005 | 0.016 | | | | | | |
| t | -2.521 | -3.828 | -2.891 | -4.275 | -3.655 | -5.195 | |
| 0.002 | 0.027 | | | | | | |

Source: Author's computation, 2024, from STATA 16

The F-statistic value of 4.478 is greater than the upper bound value of 4.159 at the 5% level of significance, but less than the 1% upper bound of 5.745. The result provides a solid basis for the rejection of the null hypothesis of 'No level relationship' at the 5% level, which implies the existence of a long-run relationship among the study variables.

4.3 Model diagnostics

4.3.1 Autocorrelation/Serial correlation test result

Table 7: Breusch-Godfrey LM test for autocorrelation

```
-----  
-----  
      lags(p) |                chi2                df                Prob >  
chi2  
-----+-----  
-----  
          1   |                1.825                1  
0.2146  
-----  
-----
```

H0: no serial correlation

Source: Author's computation, 2024, from STATA 16

The result in Table 7 shows that the p-value of the Chi-Square statistic is greater than 0.05 which indicates the absence of autocorrelation in the estimated ARDL model at the 5% level.

4.3.2 Heteroskedasticity test result

Table 8: Result of heteroskedasticity test: Breusch-Pagan-Godfrey

LM test for autoregressive conditional heteroskedasticity (ARCH)

```
-----  
-----  
      lags(p) |                chi2                df                Prob >  
chi2  
-----+-----  
-----  
          1   |                0.045                1  
0.0938  
-----  
-----
```

H0: no ARCH effects vs. H1: ARCH(p) disturbance

Source: Author's computation, 2024, from STATA 16

In Table 8, the result is used to determine if heteroskedasticity (non-constant variance) is present in the regression residuals. As shown in the Table, the p-value of the Chi2 statistic is greater than 0.05 which implies that the null hypothesis of 'no ARCH effect' is accepted.

4.4 Kernel-based regularized least squares (KRLS) result

Besides the static ARDL estimations, we went a step further to perform the Kernel-based regularized least squares (KRLS) regression analysis. The KRLS takes after Regularized Least Squares (RLS), a machine learning technique designed to solve regression and classification problems, without relying on linearity or additivity assumptions, and its estimator has desirable statistical properties, including unbiasedness, consistency, and asymptotic normality under mild regularity conditions (Hainmueller & Hazlett, 2014). We present and discuss below, the results from the KRLS method.

Table 9: Summary of the KRLS result

| Iteration = 9, Looloss: 81.68285 | | | | | Number of obs = | |
|----------------------------------|----------|---------|--------|-------|-----------------|----------|
| Pointwise Derivatives | | | | | 37 | |
| = | .1854 | | | | Lambda | |
| = | .037 | | | | Tolerance | |
| 5 | | | | | Sigma | = |
| 12.83 | | | | | Eff. df | = |
| = | .9005 | | | | R2 | |
| 79.7 | | | | | Looloss | = |
| unr | Avg. | SE | t | P> t | P25 | P50 |
| P75 | | | | | | |
| -----+----- | | | | | | |
| lnfdi | -.08874 | .030030 | -2.955 | 0.019 | -1.78507 | -1.46298 |
| -.251022 | | | | | | |
| lnfpi | -.436333 | .193754 | -2.252 | 0.028 | -.233373 | -.438548 |
| -.577151 | | | | | | |
| lnrem | -.141818 | .296305 | -0.479 | 0.635 | -.715423 | |
| -.518338 | .450799 | | | | | |
| lngdp | .2392 | .036209 | 6.606 | 0.000 | 1.6251 | 13.6375 |
| 19.6678 | | | | | | |
| inf | .02905 | .007047 | 4.122 | 0.000 | | |
| -.15021 | .11238 | .158867 | | | | |

Source: Researcher’s computation, 2024, from STATA 16

The KRLS result reveals that a 1% increase in FDI and FPI results in -0.09 percentage decrease and a -0.44 percentage decrease in unemployment rate, respectively. However, a change in inflow of foreign remittance inflow has no significant effect on unemployment rate, whereas a percentage growth in GDP and inflation rate results in 0.24 and 0.03 percentage increases unemployment rate, similar to the results we obtained from the ARDL method.

4.4 Test of Hypotheses

4.4.1 Hypothesis One

H₀: Foreign direct investment inflow has no significant impact on unemployment rate in Nigeria.

Decision rule: Reject H₀ if the p-value of the estimated t-Statistic of the foreign direct investment (lnFDI) variable in the ARDL result is less than 0.05; otherwise, do not reject H₀.

Result and conclusion: The ARDL result shows that the long-run coefficient of the variable lnFDI is -0.852 with T-stat = -3.79; whereas the result from the KRLS method revealed a coefficient of -0.089 with t-stat -2.955 and p-value = 0.019. Based on these results, we reject the null hypothesis at the 5% level and conclude that FDI inflow has a significant negative impact on unemployment rate in Nigeria both in the short run and in the long run.

4.4.2 Hypothesis Two

H₀: Foreign portfolio investment inflow has no significant impact on unemployment rate in Nigeria.

Decision rule: Reject H₀ if the p-value of the estimated T-statistic of the foreign portfolio investment (lnFPI) variable is less than 0.05; otherwise, do not reject H₀.

Result and conclusion: The ARDL result shows that the short run coefficient of the variable lnFPI is -0.4 with T-stat -2.19 whereas the long-run coefficient of the variable is -0.986 with T-stat = -2.23. Also, the result from the KRLS method revealed a coefficient of 0.436 with t statistic -2.252 and p-value = 0.028. Based on these results, we reject the null hypothesis at the 5% level and conclude that FPI inflow has a significant negative impact on unemployment rate in Nigeria both in the short run and in the long run.

5. DISCUSSION AND CONCLUSION

First, the study finds that unemployment rate (UNR) falls by about -0.9 percentage point in the long run, in response to 1% growth of FDI inflow. Theoretically, the results support the FDI spillover theory which suggests that FDI inflow can have a positive spill-over effect on the host country by reducing the level of unemployment through job creation. For instance, where FDI inflow takes the form of a foreign company opening up a branch in Nigeria, the company would usually engage local workers directly; or their former employees may go on to establish their own businesses and employ new hands. They also agree with the labour demand theory which suggests that unemployment falls as investment rises. FDI is a good source of capital inflow, but it produces good effects on the economy of the host country when there is favourable macroeconomic environment such as stable economy and ease of doing business. In this aspect of the study, we have analyzed empirical evidence and theoretical frameworks to understand the complex relationship between FDI inflows and labour market outcomes. Our findings suggest that FDI inflow had a favourable effect on the Nigerian economy through the reduction of the unemployment rate. This is enhanced by the positive externalities of FDI in the host country such as skill upgrading, wage competitiveness in the recipient sectors, and sectoral or regional development. By considering factors such as labour market flexibility, human capital development, and institutional environment, there is a wholesome rationale for attracting FDI as a way of promoting inclusive growth (Ali & Kamraju, 2022).

The empirical results of this study agree with those of the study by Alkofahi (2020) in the Kingdom of Saudi Arabia (KSA) over the period 2005-2018, Oloruntuyi (2020) in Nigeria over the 33-year period 1986-2018, and Osabohien et al. (2020) in Nigeria. However, the said finding disagrees with those of the studies by Aladelusi and Olayiwola (2021), Johnny et al. (2018), and Adeyemi et al. (2020) in Nigeria, who reported that FDI is worsening unemployment problem of Nigeria.

Second, we found that FPI growth has a significant and negative impact on unemployment rate in the long run with a regression coefficient of -0.99. The negative sign implies that FPI inflow tends to reduce unemployment rate. The finding corroborates that of Oloruntuyi (2020) who reported a significant negative impact in the period 1986-2018, and Elekwa, Aniebo, and Ogu (2016) who found that FPI has a significant positive impact on employment growth in Nigeria. Foreign portfolio investment brings about increased liquidity of the domestic capital market. It increases market capitalization and directly enhances the extent to which the domestic capital market can provide long-term funds to local investors. In Nigeria, the capital market function

of resource mobilization and allocation based on risks and returns has not developed at the same pace as the money market function of transferring funds from lenders to borrowers, and this is common in developing countries (Bascom, 1994). One reason for this is government policies that promote deposit-type instruments and lending arrangements emphasizing the use of short-term bank facilities whereas less attention is paid to policies that will promote equities and long-term debt securities. The result has been less development of the capital market in Nigeria which hinders the increased inflow of foreign portfolio investment.

The results of this study imply that increasing the level of foreign investment inflow (FDI & FPI) into the Nigerian economy will result in a lower unemployment rate. In other words, the unemployment problem of the country will be partly curbed when the country receives more foreign investment through FDI and FPI because these would provide the much-needed finance that will flow into various economic sectors of the country and get hitherto idle labour engaged in economic activities. On the evidence of the findings, the study concludes that the growth of foreign direct investment and foreign portfolio investment inflows tend to curb unemployment rate in Nigeria given a stable macroeconomic environment in the country. The study recommends as follows:

1. The federal government of Nigeria should target bilateral trade policies that encourage the attraction, retention, and leveraging foreign direct investment for job creation.
2. The federal government of Nigeria, through its Central Bank and the Securities and Exchange Commission, should seek to attract more foreign portfolio investment.

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APPENDIX I: DATA

| Year | UNR(%) | FDI(₺'M) | FPI(₺'M) | REM(₺'M) | GDP(₺'B) | INF(%) |
|------|--------|----------|----------|-------------|-----------|----------|
| 1986 | 5.3 | 735.8 | 151.6 | 3989688.356 | 15,237.99 | 5.717151 |
| 1987 | 7 | 2452.8 | 4353.1 | 2739018.355 | 15,263.93 | 11.29032 |
| 1988 | 5.3 | 1718.2 | 2611.8 | 2424527.401 | 16,215.37 | 54.51122 |
| 1989 | 4.5 | 13877.4 | 1618.8 | 10183665.81 | 17,294.68 | 50.46669 |
| 1990 | 3.5 | 4686 | 435.2 | 10008540.02 | 19,305.63 | 7.3644 |
| 1991 | 3.1 | 6916.1 | 594.9 | 65544714.33 | 19,199.06 | 13.00697 |
| 1992 | 3.4 | 14463.1 | 36851.8 | 56448404.41 | 19,620.19 | 44.58884 |
| 1993 | 2.4 | 29660.3 | 377 | 793154025.5 | 19,927.99 | 57.16525 |
| 1994 | 2 | 22229.2 | 203.5 | 549872704.1 | 19,979.12 | 57.03171 |
| 1995 | 5.9 | 75940.6 | 5785 | 250043007.2 | 20,353.20 | 72.8355 |
| 1996 | 5.4 | 111290.9 | 12055.2 | 296587337.3 | 21,177.92 | 29.26829 |

| | | | | | | |
|------|-------|------------|------------|-------------|-----------|----------|
| 1997 | 5.8 | 110452.7 | 4785.8 | 585738409.8 | 21,789.10 | 8.529874 |
| 1998 | 6 | 80749 | 637.52 | 448546824.8 | 22,332.87 | 9.996378 |
| 1999 | 19.9 | 92792.47 | 1015.74 | 1301055577 | 22,449.41 | 6.618373 |
| 2000 | 18.1 | 115952.16 | 51079.13 | 1391826072 | 23,688.28 | 6.933292 |
| 2001 | 13.7 | 132433.65 | 92518.92 | 1166614598 | 25,267.54 | 18.87365 |
| 2002 | 12.2 | 225224.76 | 24789.19 | 1208958588 | 28,957.71 | 12.87658 |
| 2003 | 14.8 | 258388.61 | 23555.51 | 1062820789 | 31,709.45 | 14.03178 |
| 2004 | 13.4 | 248224.55 | 23541 | 2272734507 | 35,020.55 | 14.99803 |
| 2005 | 11.9 | 654193.15 | 116035.03 | 14640084310 | 37,474.95 | 17.86349 |
| 2006 | 12.3 | 624520.73 | 360291.55 | 16932144079 | 39,995.50 | 8.225222 |
| 2007 | 12.7 | 759380.43 | 332547.78 | 18014430787 | 42,922.41 | 5.388008 |
| 2008 | 14.9 | 971543.79 | 157157.16 | 19199974036 | 46,012.52 | 11.58108 |
| 2009 | 19.7 | 1273815.79 | 70938.49 | 18370796915 | 49,856.10 | 12.55496 |
| 2010 | 21.4 | 905730.77 | 556585.07 | 19744755063 | 54,612.26 | 13.7202 |
| 2011 | 23.9 | 1360307.91 | 792360.22 | 20616772501 | 57,511.04 | 10.84003 |
| 2012 | 24.3 | 1113510.58 | 2687232.51 | 20542884460 | 59,929.89 | 12.21778 |
| 2013 | 29.5 | 875102.46 | 2130179.91 | 20797073957 | 63,218.72 | 8.475827 |
| 2014 | 27.4 | 738197.19 | 832392.02 | 20999084800 | 67,152.79 | 8.062486 |
| 2015 | 26.8 | 602067.82 | 498132.22 | 20626046924 | 69,023.93 | 9.009387 |
| 2016 | 24.87 | 1124148.99 | 476998.74 | 19697938004 | 67,931.24 | 15.67534 |
| 2017 | 20.42 | 1069417.29 | 2604327.74 | 22037016832 | 68,490.98 | 16.52354 |
| 2018 | 23.13 | 610381.73 | 698290.82 | 24311022416 | 69,799.94 | 12.09473 |
| 2019 | 27.1 | 432213.84 | 713920.25 | 23809281401 | 71,387.83 | 11.39679 |
| 2020 | 33.3 | 181390.12 | 109239.14 | 17207547306 | 70,014.37 | 13.25 |
| 2021 | 35.1 | 510921.04 | 832183.21 | 19483402059 | 72,393.67 | 16.95 |
| 2022 | 37.7 | 1355153.91 | 1938800.69 | 20127614151 | 74,639.47 | 18.85 |

Sources: CBN (2022); World Bank (2022)