



Interrogating the Level of Unemployment, Insecurity and Its Implication on Foreign Direct Investment in Nigeria: ARDL and Granger Causality Approach

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Abstract: This study interrogates the level of unemployment, insecurity and its implication on foreign direct investment in Nigeria (1999 to 2019) using quarterly time-series data sourced from the Central Bank of Nigeria Statistical Bulletin and World Bank's Development Indicator. The specific objectives are to investigate the effect of insecurity on foreign direct investment and to determine the causation between unemployment and insecurity. The first preliminary test employed are the Augmented Dickey-Fuller and Dickey-Fuller Generalised Least Square (GLS) unit root tests while Autoregressive Distributed Lag model, Johansen Co integration and Granger Causality test is used for the analysis. For objective one, the bounds test shows that there is a long-run connection between the dependent and independent variables. For the variables used to capture insecurity, the ARDL coefficients for both long-run and short-run revealed that the NTI and DFE exhibit a negative relationship while ISE exerts a positive relationship with FDI and are statistically significant at 1% and 5% respectively. Furthermore, it takes 21% for the model to adjust to equilibrium in the long-term. For the second objective, Johansen Co integration test further shows that there is long-run association between the regressand and regressors. The granger causality result indicates that NTI granger causes UER and DFE. From the findings above, this study recommends total overhauling and restructuring of security architecture for both military and paramilitary through the strengthening of existing laws, budgeting of substantial amount for the purchase of modern security equipment and enhancing the welfare of security personnel. If these are in place, it stands to guarantee security of life and property thereby inducing foreign investment that can create more job opportunities for teeming youths.

Key Words: Unemployment, Nigeria Terrorism Index, Foreign Direct Investment, Internal Security Expenditure, Defence Expenditure.

1. Introduction

According to (Adesina (2013)), unemployment is not only a serious economic issue but has social implications that affect almost all countries either directly or indirectly. Most often, the rising level of insecurity can be traced to increasing level of unemployment in developing country. Insecurity in Nigeria have manifested in different forms which include kidnapping (especially expatriates) for ransom, pipeline vandalism, militancy, rape, political violence and terrorism (Eme, 2011). The scholar further emphasized that terrorist activities have great effect on international business and, this is prevalent in Nigeria. According to Callistar (2015), insecurity/terrorism has been a major challenge to the Nigerian government in recent times (2002-2020). Meanwhile, study by Collier *et al.* (2003), postulated that terrorist incidents have economic consequences on investment thereby causing the diversion of foreign direct investment (FDI), destroying infrastructure, redirecting public investment funds to security, as well as limiting trade. It leads to withdrawal of investments from host countries with security challenges like Nigeria to a relative safe nations. Importantly, Balasubramanyam (1996), Todaro and Smith (2009), and Nwokoma (2013), reaffirms growth theorist's postulations on the relevance of capital inflows in developing economies as they bridge the saving investment gap.

Theoretically, eclectic paradigm theory of FDI considers ownership-specific, location-specific, and internalization paradigms as the major factors determining investment. The discourse between unemployment, insecurity and foreign is anchored under this theory and the major tenet of the theory is that when country(ies) is experiencing imbalances, it leads to severe consequence on socio-economic activities. For instance, corporations suffer from output lost caused by insecurity, which reduces its revenue (Andyopadhyay *et al.*, 2011). The economic dimension of insecurity concerns losses in FDI,

losses in GDP, damaged infrastructure, output losses, security costs, reduced economic growth, reduced tourism, trade losses, higher insurance premiums, and longer waits in airports (Abadie and Gardeazabal, 2003; Keefer and Loayza, 2008). These also have implication on unemployment since productivity is low judging from Keynesian theory of employment and can further create classes in the society because difference in resources. This imbalance then necessitate for government involvement through increase in expenditure (Wagner, 1958). Corroborating to these views, apart from lives lost, infrastructures are destroyed at the wake of insecurity and conflicts which lead to capital loss as well and consequently affect negatively investment behaviours (Gassebner, 2005). Every investor desires the security of their investment, be it in human or material resources, which is why any good entrepreneur must assess the security situation wherever he wants to invest (Jackson *et al.*, 2007).

Several studies have proven the nature, existence and the interplay of the relationship of these variables in an economy particularly in Nigeria. The study by Jelilov *et al.* (2018), confirmed negative and significant relationship between FDI and insecurity, this is evidence as the study of Adesina (2013) opined that high rate of unemployment in the country is directly responsible for the increasing security challenges in Nigeria with implication on investment development. Foreign investment has capacity to address the unemployment issues in Nigeria (Abdulhakeem *et al.*, 2019), however subject to prevailing socio-economic situation. The prevailing problem of unemployment in Nigeria has been trending upward overtime, and this is evident from data on unemployment, which have created atmosphere for insecurity. Take instance, unemployment within sub-Saharan Africa is at 17% while in Nigeria is higher than the sub-region's average at 23.9% (Central Bank of Nigeria, 2020). Similarly, the state of unrests witnessed in the Middle East that led to Arab Spring was as a result of the large growing rate of unemployment in the region (International Labour Organization (ILO), 2011). The adverse effect of this situation is that it culminates into social vices which bring about social unrest in the economy. Findings by scholars have shown that there exist a positive relationship between unemployment and insecurity in developing countries particularly in Nigeria (Adesina, 2013; Caruso and Gavrilova, 2012; Idris, 2016). Also, due to the upward trajectory in unemployment level and as well as insecurity in Nigeria, it has since prompt consistent decline in FDI into Nigeria (Callistar, 2015; Ugwu and Eme, 2019).

Statistically, according to World Bank Development Indicators (2020), Nigeria's unemployment rate as percentage (%) of total labor force (national estimate) rose significantly in 2000 to 3.83%. But, by end of year 2005 and 2010, they both declined to 3.77%. This may be attributable to fiscal policy measure under the fourth democratic regime leading to increase in foreign direct investment. However, since then unemployment rate has been on the increase which stood at 4.31% in 2015 and has risen to 8.53% in 2019 (World Bank Development Indicators, 2020). Similarly, Institute for Economic and Peace (2020) pegged Nigeria terrorism index at a relative rate of 3.59%. In the periods of 2005 and 2010, there was significant rise in the trend to 4.22% and 6.31% while for the periods of 2015 and 2019 it stood at 9.31% and 8.31% respectively. In the case of foreign direct investment as percentage of GDP into Nigeria, statistics revealed that by end of 2000 it stood at 1.64%. The increase in FDI to a significant threshold of 2.83% coincided with 2005 banks consolidation exercise in Nigeria, however the periods of 2010, 2015 and 2019 witnessed consistent decrease from 1.66% to 0.62% and 0.50% respectively (World Bank Development Indicators, 2020). The trends of these statistics (unemployment, insecurity & FDI) are worrisome and pose serious concerns for empirical investigation. It is imperative to critically investigate the effect of insecurity on foreign direct investment and to determine the causation between unemployment and insecurity in Nigeria covering the period of 1999 to 2019 using quarterly data.

2. Brief Literature Review

Insecurity is defined as a breach of peace and security, whether historical, religious, ethno-regional, civil, social, economic, and political that contributes to recurring conflicts, and leads to wanton destruction of lives and property (Ewetan and Urhie, 2014). According to Achumba *et al.* (2013), insecurity is a condition of being liable to threat, presented to hazard or tension. Oriakhi and Osemwengie (2012) further viewed insecurity to be a state where the unity, well-being, value, and beliefs, domestic process, mechanism of governance and welfare of the nation and her people are perpetually threaten and insecure continual fighting, bombing, kidnapping etc. by the aggrieved parties. National security and defense can be understood as preparedness for military action, protection of resources considered critical to the functioning of a nation to protect a country from attack or subversion (Otto and Ukpere, 2012). Also Beland (2005) viewed that the condition of dread or tension originating from an absolute absence of security or lacking opportunity from risk is viewed as insecurity. Apart from the loss of lives, insecurity is likely to have negative consequences on the investment behavior (Montclair Kimberley Academy, 2005).

The above views is corroborated by recent study of [Institute for Economics and Peace \(2021b\)](#) that insecurity has direct and indirect costs, and the expenditures to contain and prevent insecurity, thus the impact of violence goes beyond the victim and perpetrator and has economic, social and psychological implications for the larger society. This group further emphasized that insecurity produces spill-over effects both within countries and across national borders, which hinders human productivity and economic development. The economic impact of violence comprising of internal security expenditure, military expenditure, armed conflict, private security expenditure, violent crime and others has more than doubled with Niger at 106.3%, followed by Mozambique at 91.9%, Nigeria at 91.1%, Cameroon at 77.0% and Republic of Congo at 57.7% respectively ([Institute for Economics and Peace, 2021a](#)). Thus, withdrawal of FDI by multinational corporations and advanced economies may occur due to the direct destruction of infrastructure, the rise of operational costs as a result of high demand for security ([Frey et al., 2007](#)). Given the scholarly conceptualization of insecurity, this study sees insecurity to mean a situation where human lives, properties, and the environment is subjected to danger and anxiety which hinders the social, political, economic and environmental growth and development of a nation.

According to [CBN \(2016\)](#), foreign direct investment is a long term capital investment in a target country either by buying a company or by expanding operations of an existing business. [Adeleke et al. \(2014\)](#) viewed foreign direct investment to consist of mergers and acquisitions, building new facilities, reinvesting profits earned from the operations of the foreign business. Also in another study by [Adelopo et al. \(2010\)](#), sees FDI to include the assembly of investment reserves from foreign financial investors into the host economy. [OECD \(2008\)](#) views foreign direct investment to reflect the objective of establishing a lasting interest by a resident enterprise in one economy (direct investor) in an enterprise (direct investment enterprise) that is resident in an economy other than that of the direct investor. Furthermore, [UNCTAD \(2004\)](#) defined foreign direct investment (FDI) as an investment involving a long-term relationship and reflecting a lasting interest and is controlled by a resident entity in an economy (foreign direct investor or parent enterprise) in a domestic economic enterprise other than the foreign direct investor. Giving several conceptualization of FDI, one can view foreign direct investment to mean that aspect of investment that has to do with foreign investors extending their investment(s) from their home country to another country which is the host country with the aim of maximizing opportunities available and expanding their turnover on investment, there by bringing in new machines, technology, managerial skills, technical experts etc in other to maximize return on investment.

A study by [OECD \(2019\)](#) posited that the standardized International Labor Organization (ILO) definition of unemployment that was used in the surveys, viewed that the unemployed are those who did not work for at least one hour in the reference week of the survey, but who are currently available for work and who have taken specific steps to seek employment in the four weeks including the survey reference week. Thus, for example, people who cannot work because of physical impairment, or who are not actively seeking a job because they have little hope of finding work are not considered unemployed. The Nigerian [National Bureau of Statistics \(2018\)](#) like most countries in the world, uses a variant of the ILO definition such that unemployment is the proportion of those in the labour force (not in the entire economic active population, nor the entire Nigerian population) who were actively looking for work but could not find work for at least 20 hours during the reference period to the total currently active (labour force) population. Other scholars such as [Ozughalu and Ogwumike \(2013\)](#) conceptualize unemployment as a situation where people who are willing and able to work at the prevailing wage rate cannot find jobs. Also [Okigbo \(1986\)](#), [Ozughalu and Ogwumike \(2013\)](#), viewed that the taxonomy of unemployment include a condition of being out of job, an activity of searching for job, an attitude of desiring a job under certain condition and the need for a job but cannot find job. From the conceptual clarification above, unemployment means the situation in which individual(s) in a particular environment who are able and capable, qualified and ready and are actively searching for job to do at the prevailing wage and working condition but cannot find any job to do.

This research study is hinged on the theories of unemployment, insecurity and foreign direct investment. These various theories are the internalization theory and hypothesis, and eclectic paradigm theory ([Buckley and Casson, 1976;1985; Coase, 1937; Denisia, 2010; Hennart, 1982; Hymer, 1976](#)), Keynesian theory of employment ([Keynes, 1946](#)), and the law on increasing state activities ([Wagner, 1958](#)). These theories try to explain the reasons behind the way these variables react in an economy, that is, why do insecurity crops up in a society, what causes it, and what is the adverse effect it has in an economy. Also, the theories further explain why foreign investors choose to invest in a given economy other than their own home countries, and lastly, if there is a prevailing increase in insecurity issues in a particular country, which is based on empirical studies will result to a corresponding decrease in foreign direct investment with implication on the existing double digit unemployment rate. The absence of

conducive business environment for foreign investment arising from security threat tends to render the host country with high unemployment rate. Furthermore, other theorists explain the reason behind why foreign investors decide to invest in a host country, with security as one of the determining factors that guarantees safety of life and investment. Also, Marxist theory which was propounded by Karl Marx best describes this scenario of insecurity prevailing in a society that arose out of concern over the unequal ownership and distribution of the means of production, thus, the theory exposes the exploitation tendencies and appropriation of the supposed commonwealth to the few at the detriment of the masses. Finally, the Keynesian theory of employment was also chosen as the theoretical backup for explaining how the variable (unemployment) measure economic performance. From the views of the above theories, one can infer that the relationship among the variables under consideration is well captured.

The first strands of the literature review focus on insecurity and foreign direct investment. The study conducted by [Evans and Kelikume \(2018\)](#) using ARDL bounds testing approach to evaluate the effects of FDI, trade, aid, remittances and tourism on welfare under terrorism and militancy (1980-2016). The findings show that FDI, trade and tourist inflows are repressed as a result of the presence of insecurity in the long-run. Their findings also showed that insecurity has significant negative effects on welfare both in the short-run and long-run. Similarly, [Jelilov et al. \(2018\)](#) adopted correlation and Ordinary Least Square (OLS) to investigate the effect of insecurity and investment on Nigerian economy (2007-2017) and the findings show that there is negative relationship and significant effect between FDI and Nigeria terrorism index. Similarly, [Owolabi and Ayenakin \(2015\)](#) researched insecurity and FDI (2003-2012) using OLS and findings reveal a negative relationship between FDI and insecurity. Also, [Hussain et al. \(2014\)](#) investigate terrorist attacks and net inflow of FDI in Pakistan (2000-2003). The outcome of OLS results shows a negative relationship between terrorist attacks with a net inflow of FDI in Pakistan. In the study conducted in Nigeria by [Abubakar et al. \(2017\)](#) on the impact of insecurity on foreign direct investment outflow in Nigeria (2005-2015) using Johansen co integration and pair-wise granger causality test. The study findings revealed that there exists a long-run relationship between FDI outflow and defence security vote (proxy for insecurity), thus, causality runs from defence security vote to FDI outflow. [Bandyopadhyay et al. \(2013\)](#) investigate capital inflows (FDI & aid) and terrorism (1984-2008) using Dynamic panel estimation. Terrorism index exhibits negative effect on output. [Rasheed and Tahir \(2012\)](#) used co integration and granger causality technique to examine the impact of terrorism on FDI in Pakistan (2003-2011). The results revealed an inverse relationship between terrorism and FDI. [Kang and Lee \(2007\)](#) investigate the role of terrorism on FDI (1980-2002) using Dynamic panel estimation and the empirical findings revealed a significant negative relationship between FDI and number of terrorists.

From a macro perspective, [Amana et al. \(2020\)](#) using OLS and error correction model to examine the impact of government security expenditure on economic growth in Nigeria. The study findings revealed strong positive and significant effect between government recurrent defence spending, government recurrent internal security spending, government security capital expenditure and economic growth in Nigeria. In addition, [Ilemona and Abdulkareem \(2018\)](#) using exploratory analysis approach and Pearson correlation to examine the implication of insecurity on economic development in Nigeria and the outcome revealed an inverse relationship between insecurity and economic development. In the work of [Mohammed and Lawong \(2016\)](#) examined the impact of insecurity on selected macroeconomic variables used dynamic modeling approach (1960-2014). Findings indicate that the impact of insecurity is relatively higher on external sector and fiscal variables compared with domestic policy variables. [Callistar \(2015\)](#) examined the nexus between insecurity/terrorism and national development in Nigeria (1990-2012) using OLS technique and the findings of the study reveals a negative relationship between FDI and insecurity.

The second strand of this study is on unemployment and insecurity nexus. In the study by [Ugwu and Eme \(2019\)](#) on the socio-economic cost of insecurity using descriptive statistics, based on the trends of the analysis, the scholars concludes that insecurity challenge is detrimental to investment leading to destruction of properties and equipment, relocation and closing down of businesses. [Arellano \(2019\)](#) conducted a study on terror attacks and economic activity, particularly employment and rice production in Philippines (2008-2017) using regression for the analysis and findings show that terror attack is associated with decrease in the growth investment. [Idris \(2016\)](#) examined youth unemployment and violence using exploratory data analysis and finding revealed that youth unemployment is a factor in youth participation in violence. Also, [Adesina \(2013\)](#) investigate unemployment and security challenges in Nigeria using exploratory data analysis and findings portray that high rate of unemployment in the country is directly responsible for the increasing security challenges. [Azeng and Yogo \(2013\)](#) investigate the effects of youth unemployment on political instability (1980-2010). The outcome of the fixed-effects regression show that youth unemployment is significantly associated with increased risk of political instability. Similarly, [Caruso and Gavrilova \(2012\)](#) conducted a study on youth unemployment, terrorism and political violence

in Palestinian. Findings from the exploratory data analysis revealed a positive relationship between youth unemployment and terrorism. In addition, using exploratory data analysis, [Caruso and Schneider \(2011\)](#) examine the socio-economic determinants of terrorism and political violence in Western Europe (1994-2007). The findings reveal a positive association between youth unemployment and terrorism in Western Europe.

Most of the studies on the first strand failed to capture explicitly variables that can account for changes in insecurity such as Nigeria terrorism index alongside government defence recurrent expenditure and internal security recurrent expenditure, especially with the involvement of all the paramilitary and military in recent time in the fight against insecurity. Also, germane variables of trade openness, exchange rate and effective governance index included as a control variables in objective one. For the second strand, reviewed studies on unemployment and insecurity in Nigeria are mostly exploratory data analysis. This study therefore contribute to knowledge by determining the causation between unemployment and insecurity (proxy by Nigeria terrorism index) in addition to variables like Gini coefficient, effective governance index, defence recurrent expenditure and internal security recurrent expenditure that can account for changes in insecurity. The uniqueness of this study is that, it is conducted within the period's unemployment and insecurity became pronounced (1999 – 2019) under the fourth democratic regime.

3. Materials and Methods

The data are annual time series mainly sourced from the online database of the Central Bank of Nigeria Statistical Bulletin, World Bank's Development Indicator and Institute for Economic and Peace. The data spanned from 1999 to 2019 using quarterly data. On the choice of the country under consideration was mainly inform by the availability of data and pronounced occurrence of insecurity issue and persistent rise in unemployment rate in Nigeria. Time series data include foreign direct investment as percent of GDP (dependent variable) while the independent variables are Nigeria terrorism index (NTI), internal security expenditure (ISE), defence expenditure (DFE), trade openness (TOP), effective governance index (EGI) and exchange rate (EXR, Naira/US\$) for objective one. For objective two, the data include NTI (dependent variable) while the explanatory variables are unemployment rate (UER), ISE, DFE, Gini coefficient and EGI.

FDI focuses on acquiring ownership of assets for controlling the production, distribution and other activities of a firm in another country and this can raise productivity of host country through technology transfers and it is measure as percentage of GDP in this study. NTI measures the increase and decrease effects of terrorism/insecurity on socio-economic activities and its measure ranges from 0 (no impact) to 10 (highest impact). ISE and DFE is financed by tax revenue, borrowings, and changes in government expenditure are a major component of fiscal policy used to stabilize the economy and it is measure in billion Naira. Exchange Rate measure the rate at which Naira exchange for foreign currency in this case US\$. Trade Openness (TOP) is obtained by dividing total trade over nominal gross domestic product. EGI summarizes the views on the quality of governance and measure the relative level of political, social, and economic stability of a country ([Kaufmann et al., 1999](#); [Kaufmann et al., 2003](#)), which has been emphasized on in a revised Washington Consensus ([Stiglitz, 2001](#)) and it is measure as an index. Gini Index (wealth distribution) best captures sustainability of social development and living condition improvement variables and it is measure in ratio or percentage. Importantly, the variables of FDI as % of GDP, EXR and Gini ratio are sourced from [World Bank Development Indicators \(2020\)](#), ISE, DFE, UER and TOP are obtained from [Central Bank of Nigeria \(2020\)](#) while data on NTI are collected from [Institute for Economics and Peace \(2021b\)](#). In addition, only the variables of ISE, DFE, EXR and FDI are logged to assumed close or the same units of measurement with TOP and GINI ratio and by extension make moderately skewed data more normally distributed and to achieve constant variance.

Essentially, the study applied the Augmented [Dickey and Fuller \(1979\)](#) and Dickey Fuller (DF) Generalised Least Square (GLS) proposed by [Elliot et al. \(1996\)](#) unit root tests to ascertain the stationarity of the series under consideration. The ADF and DF GLS is applied in order to check the integrating properties of the investigated variables. The null hypothesis for ADF is $H_0 : \rho = 0$ while the alternative is $H_1 : \sigma_v^2 > 0$. Z-test is then used for this hypothesis testing in ADF. Given the order of integration of the series, this study used Autoregressive Distributed Lag ([Pesaran et al., 2001](#)), Johansen Co integration ([Johansen and Juselius, 1990](#)) and Granger Causality test ([Engle and Granger, 1987](#)) techniques for estimation.

The model of [Amana et al. \(2020\)](#) using OLS and error correction model to examine the impact of government security expenditure on economic growth in Nigeria (1986-2018) was adapted. The functional form of the model is expressed in equation 1.

$$RGDP = f(GRDEXP, GRISEXP, GSCAEXP) \text{-----Eqn.1}$$

Where: RGDP = Real Gross Domestic Product; GRDEXP = Government Recurrent Defence Spending; GRISEXP = Government Recurrent Internal Security Spending, GSCAEXP = Government Security Capital Expenditure.

However, given the objective of examining the effect of insecurity on foreign direct investment in Nigeria covering the period of 1999 to 2020 using quarterly data, the model by [Amana et al. \(2020\)](#) was adapted with modification through the inclusion of the variables of trade openness, effective governance index and exchange rate. The functional form of the model is expressed in equation 2:

$$FDI = f(NTI, ISE, DFE, TOP, EGI, EXR) \text{-----Eqn.2}$$

The ARDL model specification of the above functional form is express in equation 3;

$$\begin{aligned} \Delta FDI_t = & \gamma_{10} + \gamma_1 \Delta FDI_{t-1} + \gamma_2 \Delta NTI_{t-1} + \gamma_3 \Delta ISE_{t-1} + \gamma_4 \Delta DFE_{t-1} + \gamma_5 \Delta TOP_{t-1} + \gamma_6 \Delta EGI_{t-1} \\ & + \gamma_7 \Delta EXR_{t-1} + \sum_{i=1}^k \varphi_{1i} \Delta FDI_{t-i} + \sum_{i=1}^k \varphi_{2i} \Delta NTI_{t-i} + \sum_{i=1}^k \varphi_{3i} \Delta ISE_{t-i} + \sum_{i=1}^k \varphi_{4i} \Delta DFE_{t-i} + \\ & \sum_{i=1}^k \varphi_{5i} \Delta TOP_{t-i} + \sum_{i=1}^k \varphi_{6i} \Delta EGI_{t-i} + \sum_{i=1}^k \varphi_{7i} \Delta EXR_{t-i} + E_t \text{-----Eqn.3} \end{aligned}$$

Where $\delta_1 - \delta_7$ are the long run parameters; $\varphi_1 - \varphi_7$ are the short run parameters; δ_0 and e are the intercept term and the white noise stochastic term respectively; λ is the parameter of the error correction mechanism (ECM); log is the differenced variables; and Δ is the difference operator. A shock to any of the regressors may not result in an immediate long-run effect on FDI , which creates disequilibrium in the system and requires that the short-run adjusts to its long-run equilibrium through the error correction mechanism (ECM_{t-1}). The ECM_{t-1} is a one lag error correction term that accounts for the speed of adjustment to the long-run equilibrium.

Where: FDI = Foreign Direct Investment (% GDP in US\$), NTI = Nigeria Terrorism Index (Index), DFE = Defence Expenditure (₦'billion), ISE = Internal Security Expenditure (₦'billion), TOP = Trade Openness (Index), EGI = Effective Governance Index (Index), EXR = Exchange Rate (Price).

Importantly, given the different sources of the data under consideration, the variables of DFE, ISE, NTI and EXR are logged to assume the same unit of measurement before conducting ADF and DF GLS unit root test.

The second objective of this study is to determine the causation between unemployment and insecurity in Nigeria covering the period of 1999 to 2019. The model for this objective is guided by empirical study of [Arellano \(2019\)](#) who conducted a study on terror attacks and economic activity, particularly employment and rice production in Philippines(2008-2017) using regression for the analysis. The functional form of the model is expressed in equation 4.

$$\gamma_{i,t} = \alpha + \sum_{n=0}^3 \beta_n \text{terror}_{i,t-n} + \gamma_i + \lambda_t + \varepsilon_t \text{-----Eqn.4}$$

Where: $\gamma_{i,t}$ is an economic outcome in province i at quarter-year period t . The study used employment rate and log of rice production as measures of economic outcome. The term $\text{terrorism}_{i,t}$ is represent the number of terror incidents. In another specification, the study used the number of deaths from these terror attacks as the explanatory variable. Province fixed effects γ_i and time fixed effects λ_t are included. The coefficient of interest is β .

However, the model above by [Arellano \(2019\)](#) is modified with the incorporation of Nigeria terrorism index, defence recurrent expenditure and internal security recurrent expenditure in addition to

the control variables of GINI ratio and effective governance index. The functional form of the model is expressed in equation [5]:

$$NTI = f(UER, ISE, DFE, GINI, EGI) \text{-----Eqn.5}$$

The mathematical form of the model is expressed in equation [6] below:

$$NTI = \delta_0 + \delta_1 UER + \delta_2 ISE + \delta_3 DFE + \delta_4 GINI + \delta_5 EGI + \varepsilon_t \text{-----Eqn.6}$$

Where: NTI = Nigeria Terrorism Index (%), UER = Unemployment Rate (%), GINI = GINI Index (%), ISE = Internal Security Expenditure ((₦'billion), DFE = Defence Expenditure (₦'billion), EGI = Effective Governance Index (%).

However, for objective two, it is important to that Johansen's cointegration test (Johansen and Juselius, 1990) is conducted to check whether the long run equilibrium exists between the variables. The Johansen approach to cointegration test is based on two test statistics, viz., trace statistic, and maximum Eigen value statistic. The trace statistic can be specified as in equation [7] below:

$$Trace(r, k) = -T \sum_{i=r+1}^k \ln(1 - \lambda_i) \text{-----Eqn.7}$$

Where λ_i is i^{th} largest Eigen value of matrix Π and T represent the number of observations while in the trace test, the null hypothesis is that the number of distinct cointegrating vector(s) is less than or equal to the number of cointegration relations (r). The maximum eigenvalue test examines the null hypothesis of exactly r cointegrating relations against the alternative of r + 1 cointegrating relations with the test statistic in equation [8]:

$$\lambda(r, r + 1) = -T \ln(1 - \lambda_{r+1}) \text{-----Eqn.8}$$

At the end, the Granger Causality test (Engle and Granger, 1987) has been used to find out the direction of causality between the variables. To test for Granger Causality, the following bi-variate regression model can be used as in equation [9] and [10]:

$$\gamma_t = \alpha_{o+} \sum_{i=1}^m \alpha_i \gamma_{t-i} + \sum_{j=1}^n \beta_j X_{t-1} + \varepsilon_t \text{-----Eqn.9}$$

$$X_t = \omega_{o+} \sum_{i=1}^m \gamma_i Y_{t-i} + \sum_{j=1}^n \theta_j X_{t-1} + \varepsilon_t \text{-----Eqn.10}$$

If all the coefficients of x in the first regression equation of y, i.e. β_i for $i = 1, \dots, n$ are significant, then the null hypothesis that x does not cause y is rejected.

4. Results and Discussion

In this section, the study focuses on the descriptive statistics of the series, stationarity result, bound test, long and short run ARDL estimates, co integration test and granger causality result.

Table 1. Descriptive Statistics

	FDI	NTI	ISE	DFE	TOP	EGI	EXR	GINI	UER
Mean	1.60	6.34	235.64	197.53	0.21	0.98	165.88	45.98	4.65
Std. Dev.	0.69	2.13	173.99	160.45	0.18	0.24	67.75	4.57	1.75
N_Std. Dev.	0.43	0.34	0.74	0.81	0.85	0.25	0.41	0.09	0.38
Skewness	0.16	-0.06	0.71	0.79	-0.18	-3.29	1.27	0.75	1.60
Kurtosis	2.21	1.57	2.87	2.62	1.32	14.34	3.23	2.82	3.75
Jarque-Bera	0.63	1.80	1.78	2.29	2.59	150.51	5.70	2.02	9.49
Probability	0.73	0.41	0.41	0.32	0.27	0.00	0.06	0.36	0.01

Source: Extract from E-view 10 Output, 2021

Table 1 holds statistical characteristics of the variables used in this study. The statistics revealed an average growth of 1.6%, 6.3%, ₦235.6billion and ₦197.5billion for FDI, NTI, ISE and DFE respectively. Similarly, it is evident from the results that the TOP, EGI, EXR, GINI and UER had an average growth of 0.2%, 0.9%, 165.8, 45.9% and 4.6% over the period of the study. Because of differences in unit of measure in the data series, the calculated standard deviations were normalized to arrive at uniform values. All the series under the N_Std. Dev. (i.e. computed standard deviation) exhibit a uniform value that is less than proportional, which implies that the series exhibit stability. As for the distribution of the skewness, the series is roughly equal given the closeness to zero for most of the series. Importantly the variables of FDI, NTI, DFE, TOP and exhibits platykurtic distribution given their kurtosis values of less than three. ISE and GINI with an approximate values of 3 can be regarded as mesokurtic. However, EGI and UER exhibit leptokurtic distribution. Finally, the Jarque-Bera statistic implying that the series are not normally distributed given the validity of the significant values.

Table 2. Stationarity Result

	Augmented Dickey and Fuller (1979)				Dickey Fuller GLS			
	@ Level		@ 1 st Diff.		@ Level		@ 1 st Diff.	
	Intercept	Intercept & Trend	Intercept	Intercept & Trend	Intercept	Intercept & Trend	Intercept	Intercept & Trend
FDI	-1.039198	-2.159708	-3.950678	-	-1.013565	-1.797724	-3.926354	-
NTI	-1.558864	-1.597062	-3.445323	-	0.019314	-1.430611	-3.227025	-
ISE	-1.298759	-2.169337	-3.547800	-	-0.174260	-2.434033	-3.194258	-
DFE	-0.400427	-2.743339	-4.027795	-	0.299256	-2.130580	-2.593293	-
TOP	-1.813228	-1.567128	-3.588353	-	-1.362399	-1.838317	-3.085848	-
EXR	-0.455106	-2.260778	-2.602427	-	0.301551	-2.326884	-2.475220	-
EGI	-4.537782	-	-	-	-4.775917	-	-	-
GIN I	-3.885964	-	-	-	-1.835776	-	-	-
UER	-0.333561	-1.406822	-2.654191	-	-0.918275	-1.651480	-2.552258	-

Notes: ADF and DF GLS statistics is presented at intercept and intercept & trend for both at level and 1st difference, which the null hypothesis of non-stationarity is rejected for all tests. The values are reported using 5% level of significance. The study stick to optimal lag (11) order selected based on Schwarz information Criterion (SIC).

The standard procedure on the data analysis was using a unit root test to check for stationarity. The ADF and DF GLS tests was employ and the Table 2 above shows the results of the test, with the series becoming stationary at level (that is I(0)) and first difference (that is I(1)). Hence, the next stage for objective two is to proceed to the ARDL bound approach to ascertain the long-run relationship amongst the variables.

Table 3. Bound Test Result

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	3.736577	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Extract from E-view 10 Output, 2021

Table 3 shows that the F-statistic is greater than the upper bound value of 3.28 at 5% level of significance. The result indicates association among the variables under deliberation. This is a confirmation of connection amongst the variables, long-run and short-run dynamics can be investigated. In addition, given 83 observations, the selection lag is 1, 0, 0, 0, 0, 0, and 0.

Table 4. Estimated Long-run Coefficients using the ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NTI	-7.484055	2.915784	-2.566739	0.0123
ISE	7.368315	2.233167	3.299491	0.0015
DFE	-3.478768	1.600631	-2.173373	0.0329
TOP	-0.071710	0.938052	-0.076446	0.9393
EGI	0.034294	0.504999	0.067909	0.9460
EXR	-0.557854	0.653052	-0.854227	0.3957
C	3.782604	2.349758	1.609784	0.1116
<i>Estimated Short-run Coefficients</i>				
C	0.785282	0.614724	1.277456	0.2054
FDI(-1)*	-0.207604	0.061728	-3.363213	0.0012
NTI**	-1.553717	0.539642	-2.879165	0.0052
ISE**	1.529689	0.461025	3.318017	0.0014
DFE**	-0.722205	0.408189	-1.769290	0.0809
TOP**	-0.014887	0.196083	-0.075923	0.9397
EGI**	0.007120	0.105178	0.067690	0.9462
EXR**	-0.115813	0.140730	-0.822940	0.4132
CointEq(-1)*	-0.207604	0.045987	-4.514387	0.0000

Source: Extract from E-view 10 Output, 2021

Table 4 reveals that coefficient of NTI exhibit negative relationship and significant effect on FDI in the long run at 1% significant level. This implies that, a unit change in the value of NTI will bring about - 7.48 unit change in the value of FDI. This outcome is in line with the findings of Jelilov *et al.* (2018), Owolabi and Ayenakin (2015), Hussain *et al.* (2014), Kang and Lee (2007) but contrary to the finding of Mohammed and Lawong (2016). However, available statistics shows that Nigerian terrorism index proxied for insecurity average 6.34% between the periods of 1999 to 2019, which is an indicative of highest impact given its closeness to the score of 10. Importantly, given the elasticity of result, any little change in government policies on insecurity, can enhance conducive environment for foreign investment to flourish. The result also revealed that ISE exerts positive relationship and significant effect on FDI in the long run at 5% significant level. This means that a unit changes in ISE will bring about 7.37unit change in the value of FDI. This empirical result conforms to the finding of Amana *et al.* (2020) but against the outcome of Ilemona and Abdulkareem (2018). Contemporarily, giving the reoccurrence of insecurity across the country, Nigerian government have being budgeting substantial amount to curb the incessant insecurity challenge, this is evidence given the average internal security expenditure to the tune of ₦235.6431billion between the periods of 1999 to 2019, which relatively give credence to the sign of ISE. In addition, the value of DFE exhibit negative relationship and significant effect on FDI at 5% significant level in long-run, which is in line with the findings of Callistar (2015), however contrary to the finding of Amana *et al.* (2020). The implication is that, a unit change in DFE, will lead to -3.48unit change in the value of FDI. Statistically, defence expenditure within the corresponding periods of the study, it average ₦235.6431billion, which is quite significant but seems not to correspond with the high level of insecurity in Nigeria. However, the negative relationship obtained might also explain government inability to get modern equipment that can address the menace of insecurity especially with the full involvement of military in internal security issue.

For the short-run dynamics still on Table 4, the coefficients of NTI and DFE exhibit negative relationship and significant effect at 1% and 10% level while ISE exerts a positive relationship and significant effect at 1% level. On the other hand, the variables of TOP and EXR portray negative correlation and insignificant effect while EGI exhibits a positive relationship and insignificant effect on FDI as percentage of GDP. The result of the short run dynamic coefficients associated with the long run relationships obtained from the ECM equation is negatively signed and statistically significant at 1%. The ECM coefficient suggests a mild speed of adjustment strategy roughly 21%. This means that

approximately 21% of disequilibrium from the previous year's shock converges back to long run equilibrium in the current year.

Table 5. Diagnostic Results

Test	Value	Prob
Ramsey Reset Test	0.004	0.95
Heteroscedasticity Test	0.84	0.56

Source: Extract from E-view 10 Output, 2021

The diagnostic tests presented on Table 5 shows that there is no evidence of diagnostic problem with the model. The Ramsey reset test result shows that the p-value = 0.95 is greater than the critical value $F_{0.05}$, we do not reject the null hypothesis, we therefore conclude that the estimated model is correctly specified at the 5% significant level. The White heteroscedasticity test suggests that the disturbance term in the equation is homoscedastic. Since calculated p-value 0.56 is greater than critical $F_{0.05}$, we do not reject the null hypothesis of homoscedasticity and conclude that the error terms have constant variance at 5% level of significance.

In order to proceed with the objective two of determining the causation between unemployment and insecurity, the first test is to ascertain the order of integration, thus the ADF and DF GLS statistics on Table 2 for the series of NTI, UER, ISE, DFE, GINI, and EGI achieve stationarity at level and first difference. Hence, the next stage is to conduct co integration test amongst the variables. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary time series may be stationary. If such a stationary linear combination exists, the non-stationary time series is said to be co integrated. The stationary linear combination may be interpreted as a long run equilibrium relationship between the variables. In addition, it also means that those variables that are order $I(0)$ can automatically become $I(1)$, which means it could assume uniform order of co-integration. The Johansen system framework is employ to test for the presence of co integrating relationships among the non-stationary variables. The result is presented on Table 6:

Table 6. Johansen Co integration Test Result

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.460000	135.9391	95.75366	0.0000
At most 1 *	0.421247	86.02806	69.81889	0.0015
At most 2	0.250311	41.73076	47.85613	0.1664
At most 3	0.117500	18.39496	29.79707	0.5370
At most 4	0.087047	8.270213	15.49471	0.4370
At most 5	0.010970	0.893442	3.841466	0.3445
Trace test indicates 2 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon et al. (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.460000	49.91108	40.07757	0.0029
At most 1 *	0.421247	44.29730	33.87687	0.0020
At most 2	0.250311	23.33580	27.58434	0.1596
At most 3	0.117500	10.12475	21.13162	0.7329
At most 4	0.087047	7.376772	14.26460	0.4456
At most 5	0.010970	0.893442	3.841466	0.3445
Max-eigenvalue test indicates 2 cointegratingeqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon et al. (1999) p-values				

Source: Extract from E-view 10 Output, 2021

Table 6 holds the result of co-integrating equation(s) and the result shows the long-run relationship between the explanatory variables and the dependent variable, this further confirms the findings of Caruso

and Gavrilova (2012) and Azeng and Yogo (2013). Importantly, given the trace and max-eigen value test indicating 2 co integrating eqn(s) each, this implies that the non-stationary time series are co integrated. The application of the pair-wise granger causality approach will therefore yield dependable results. Based on the stationary linear combination, the causation between unemployment and insecurity is determined via the pair-wise granger causality method. The result is presented on Table 7:

Table 7. Pair-Wise Granger Causality Result

Null Hypothesis:	Obs	F-Statistic	Prob.
UER does not Granger Cause NTI	81	0.55844	0.6441
NTI does not Granger Cause UER		2.34833	0.0794
ISE does not Granger Cause NTI	81	0.82763	0.4828
NTI does not Granger Cause ISE		1.16473	0.3290
DFE does not Granger Cause NTI	81	1.88602	0.1393
NTI does not Granger Cause DFE		3.59794	0.0174
GINI does not Granger Cause NTI	81	0.25066	0.8606
NTI does not Granger Cause GINI		1.53723	0.2120
EGI does not Granger Cause NTI	81	0.09233	0.9641
NTI does not Granger Cause EGI		1.73933	0.1663

Source: Extract from E-view 10 Output, 2021

Table 7 holds the outcome of the causation between unemployment and insecurity. The result shows that there is unidirectional association between NTI and UER, i.e. NTI granger causes UER and it is statistically significant 10% .Similarly, NTI exhibit causation with DFE and statistically significant, which means, increase in the level of insecurity give rise to defence expenditure. The rest of the series exhibit no causation.

5. Conclusion and Policy Remarks

The fourth democratic regime has witnessed increase in unemployment rate culminated into high level of insecurity with adverse implication on foreign investment into Nigeria. This study therefore interrogates the level of unemployment, insecurity and its implication on foreign investment into Nigeria under the fourth democratic regime (1999 – 2019) using quarterly data. Specifically, the objectives of the study are to investigate the effect of insecurity on foreign direct investment and to determine the causation between unemployment and insecurity. Given the order of integration from the stationarity results, the study employs ARDL approach and granger causality technique. In other to achieve objective one, three variables (NTI, ISE & DFE) were used to account for changes in insecurity: Nigerian terrorism index exert negative relationship, internal security expenditure exhibit positive relationship while defence expenditure further display negative relationship with foreign direct investment and the three variables are statistically significant at 1% and 5% respectively. This implies that the fight against insecurity in Nigeria is on course given the negative relationship between NTI, DFE and FDI but the positive relationship between ISE and FDI is worrisome especially that the security threat is an internal issue that supposed to be handled by paramilitary personnel (e.g. Police, Immigration, Custom, Civil Defence & Correctional Centre) as against the full involvement of the military. For the second objective, there is only one way causation, that is, NTI granger cause unemployment and defence expenditure. The implication is that, increase in insecurity aggravates more rise unemployment rate because of low investment, consequently necessitating rise in military expenditure given external affiliation with sects groups wreaking havoc and disrupting socio-economic activities.

This study therefore concludes that Nigeria’s security challenge cannot guarantee foreign investment given the positive sign of internal security expenditure, in addition to the significant causation between NTI and foreign direct investment. From the findings above, this study recommends total overhauling and restructuring of security architecture for both military and paramilitary through strengthening of existing laws, budgeting of substantial amount for the purchase of modern security equipment and enhancing welfare of security personnel. It is only when security personnel welfare is adequately addressed through the provision of good housing, hazard allowance, increase minimum wage that he/she can be committed to the fight against insecurity. If these are in place, it stands to guarantee security of life and property thereby inducing foreign investment that can create more job opportunities for teeming youths.

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