CHAPTER EIGHT

INTERACTIVE EFFECTS OF INSECURITY AND INSTITUTIONAL QUALITY ON FOREIGN DIRECT INVESTMENT FLOW IN NIGERIA

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Abstract

This study investigated the direct and interactive effects of insecurity and institutional quality on foreign direct investment (FDI) in Nigeria from 1996-2022. Annual time series data were sourced from the Central Bank of Nigeria, the World Bank Governance Indicators, and the Institute for Economics and Peace. Methodologically, the augmented Dickey–Fuller (ADF) unit root test was applied to explore the stationarity properties of the data, with findings indicating that all variables are stationary at the first difference I (1). The optimal lag of one was determined via various selection criteria. The results of the vector error correction model (VECM) revealed that insecurity negatively affects FDI in the long run but has a positive insignificant effect in the short run. Short-term effects show that voice and accountability, as well as government effectiveness, positively influence FDI, whereas political stability, the absence of violence, and regulatory quality have weak negative impacts. Conversely, control of corruption significantly positively affects FDI. The long-term findings indicate that regulatory quality and the rule of law significantly enhance FDI, whereas other institutional variables have negative effects. The results of the interaction of insecurity and institutional quality show a negative but insignificant effect on FDI. The study recommended, among other goals, the need for government agencies to focus on capacity building to improve regulatory frameworks, legal systems, and governance mechanisms.

Keywords: Insecurity; Institutional quality; foreign direct investment; Nigeria; VECM

1. Introduction

Nations across the globe share the common objective of achieving sustained economic growth and development. To realize these goals, countries endeavour to create environments conducive to investment, innovation, and opportunities for their populations. Foreign direct investment (FDI) serves as a vital instrument for achieving these objectives and is a pivotal global economic force acknowledged for its role in driving economic advancement (Dunning, 1993; Blomström & Kokko, 2003).

Historically, cross-border capital flows have demonstrated a steady upward trend, growing at an annual rate of approximately 6% since 1980, outpacing the growth of global GDP and trade (Ju & Wei, 2007). For example, between 1996 and 2006, international trade in goods and services grew by 8%, whereas FDI net inflows surged by 19%. Despite these gains, the benefits of FDI are not automatically realized or uniformly distributed across nations. Nonetheless, FDI is pivotal in providing recipient countries with crucial financial capital, advanced technologies, and job opportunities (Wolf, 2008).

Emerging economies have consistently played a prominent role in the global market, drawing considerable interest as hubs for foreign direct investment (FDI). The dynamics of FDI in these regions are characterized by distinct trends and critical factors. These trends have been driven by globalization, the liberalization of economies, and improvements in investment climates, making these countries more attractive to foreign investors (UNCTAD, 2019). The distribution of FDI among developing countries is not uniform. Economically, developed countries and regions often receive a large share of FDI, whereas less developed areas struggle to attract substantial investments. This has led to notable regional differences in FDI inflows, with emerging markets and key growth centers frequently attracting the most investment (UNCTAD, 2019). Nevertheless, the extent to which FDI contributes to a nation's growth and development largely hinges on the host country's economic and social environment (Buckley et al., 2002).

The significance of institutional quality in attracting foreign direct investment (FDI) to developing nations has been well established" (Bisson, 2011). According to Bruinshoofd (2016), institutional quality encompasses laws, individual rights, and robust government regulations and services, all of which promote economic progress. The role of high-quality institutions in fostering investment and economic growth cannot be overstated. As Ugwuanyi and Eze (2023) note, well-functioning institutions provide a stable and secure climate for foreign investors by safeguarding property rights, upholding the rule of law, and reducing corruption and bureaucratic hurdles. Investors are naturally drawn to countries with strong institutional frameworks because they offer a predictable and trustworthy environment for conducting business. This, in turn, reduces the risks associated with investments and enhances the overall attractiveness of a nation for foreign direct investment. Muhammed and Charles (2018) contended that in areas where institutional quality is deficient, as evidenced by corruption within civil service, bureaucratic obstacles, and elevated levels of extortion, a climate of distrust may arise. Such an environment can prove detrimental to conducting business, adversely affecting both domestic and foreign investors. As noted by Buchanan et al. (2012), weak institutional quality can breed insecurity, which, in turn, adversely affects foreign direct investment (FDI).

As a developing nation, Nigeria heavily depends on foreign direct investment (FDI) inflows to fuel its economic growth. Over time, the Nigerian government has implemented several FDI-focused policies, such as the Structural Adjustment Programme (SAP) in 1986, the Industrial Development Coordinating Committee (IDCC) in 1988, the Multilateral Investment Guarantee in 1988, and the Nigerian Investment Promotion Commission in 1995. Despite these measures, FDI inflows into Nigeria have followed an erratic pattern. Between 1996 and 1998, net FDI inflows were less than 1% of GDP. This figure rose to over 1% from 1999--2004, increased above 2% between 2005 and 2009, and peaked at 2.93% in 2009. However, the trend reversed, with inflows falling to a low level of 0.50% in 2018 before increasing

slightly to 0.74% in 2019 (Development Indicators, 2020). Simultaneously, Nigeria's institutional quality has deteriorated, with key indicators—such as the rule of law, government effectiveness, control of corruption, regulatory quality, voice and accountability, and political stability—showing a consistent negative trend throughout the 21st century (World Bank, 2021). Additionally, the country faces heightened insecurity, including Boko Haram insurgency, farmer-herder clashes, kidnappings, banditry, ethnic and religious tensions, political instability, and various economic challenges. These security concerns have raised critical questions about their impact on both domestic and foreign investment in Nigeria. Against this backdrop, this study aims to explore the influence of institutional quality and insecurity on FDI in Nigeria. This study aims to investigate the effects of institutional quality and insecurity on foreign direct investment in Nigeria.

While previous empirical studies (Bahoo et al., 2023; Sabir et al., 2019; Ijirshar et al., 2019; Ochuko et al., 2017; Chen and Kumar, 2015; Oladimeji & Oresanwo, 2014) have shed light on the relationships among insecurity, institutional quality, and foreign direct investment (FDI), the findings remain inconclusive, particularly regarding various institutional quality measures. Additionally, the institutional factors influencing FDI differ across countries, casting doubt on the validity of cross-country analyses (Deaton, 1989). Hence, a country-specific analysis of the impact of institutional quality on FDI is essential. A review of these studies also reveals that none have explored the interaction between insecurity and institutional quality in relation to FDI. Therefore, this study aims to empirically examine the direct impact of insecurity and institutional quality on FDI in Nigeria from 1996--2022 while also investigating the interaction between insecurity and a composite institutional quality index. This period was chosen because of data availability and its significance in capturing the shifting landscape of insecurity and institutional quality in Nigeria, as well as evolving trends in FDI. The results of this study provide critical insights for policymakers. By uncovering the links between insecurity, institutional quality, and

FDI, this study equips government officials with the knowledge needed to formulate effective policies. It aids in the creation of strategies to reduce insecurity, strengthen the quality of institutions and hence promote the inflow of foreign investment in Nigeria.

2. Literature Review

Theoretical and empirical review

This section presents a review of related theories. The theories considered here are the North theory of new institutions, the Eclectic paradigm, and the Conflict Theory.

North's Theory of New Institutions: Over the last four decades, new institutional economics (NIE) has concentrated on the influence of institutions on economic development, with Douglass North (1920–2015) being a key contributor to this discipline. North, a Nobel Memorial Prize winner in Economics in 1993, described institutions as 'the rules of the game in society' or as 'human-devised constraints that shape human interactions.' These institutions aim to mitigate challenges arising from imperfect and asymmetric information, commonly referred to as transaction costs. North categorized these constraints into formal and informal rules, which together constitute the 'rules of the game.' Institutions play a vital role in safeguarding property rights, enforcing contractual agreements, and curbing political interference in economic activities, thereby facilitating market efficiency over time.

At the core of North's theory is the notion that effective institutions minimize uncertainty in economic transactions. By implementing clear and enforceable rules, ensuring property rights, and facilitating contract enforcement, institutions enable economic agents—both businesses and individuals—to predict the outcomes of their actions with greater precision. This predictability enhances confidence and promotes efficient interactions among market participants. North highlighted that well-functioning institutions reduce transaction costs by establishing a stable and dependable environment for trade. Moreover, they influence production costs by

shaping the regulatory landscape and the overall business environment. A robust institutional framework enhances predictability in business operations and reduces associated costs. Additionally, North posited that decreasing uncertainty and fostering efficient economic exchanges boosts the profitability of investments. Investors, both domestic and foreign, are more inclined to invest in an environment where the legal and regulatory frameworks are trusted and where property rights are secure.

While North's theory has made significant contributions, it is not without its limitations. Critics argue that the theory can be vague and at times contradictory, partly because it is rooted in neoclassical economic thought. Although North acknowledged the shortcomings of neoclassical economics, his theory largely adhered to these principles, which led to similar criticisms. Furthermore, North's emphasis on Western economies as the ideal models for institutional development resulted in limited examination of alternative institutional frameworks, which were often viewed as deviations. Another limitation of the theory is North's reluctance to fully account for the role of organizations and social conflicts within institutional structures, which diminishes its applicability and relevance across different contexts.

Eclectic Paradigm: John Dunning, an influential economist, developed the Eclectic Paradigm, commonly known as the OLI framework. First introduced in the 1970s and further refined over time, the OLI framework represents three key factors—ownership, location, and internalization—that shape a firm's decision to undertake foreign direct investment (FDI). In 2001, Dunning expanded on this model in his book 'The Eclectic Paradigm as an Envelope for Economic and Business Theories of MNE Activity.' The OLI framework has since become a widely utilized tool for understanding and analyzing the motivations and strategies of multinational enterprises (MNEs) when making foreign investment decisions. As noted by Adenuga (2023), these factors are explained below.

Ownership (O): Ownership advantages refer to the unique advantages that a firm possesses, such as proprietary technology, brand reputation, management skills, or other intangible assets. The ownership aspect of the framework suggests that, for a firm to engage in foreign direct investment, it must have some competitive advantage that gives it an edge over local competitors in the foreign market.

Location (L): Location advantages pertain to the specific advantages that a particular foreign market offers. These advantages could include access to natural resources, a skilled workforce, favorable market conditions, or other factors that make a particular location attractive for investment. The location factor in the framework emphasizes the importance of choosing the right geographic area for investment.

Internalization (I): Internalization refers to the decision of a firm to exploit its ownership advantages within a foreign market through direct investment rather than relying on other market mechanisms such as licensing or exporting. The internalization aspect of the framework suggests that firms choose to establish a presence in a foreign market when the benefits of maintaining control over their unique assets outweigh the costs and risks associated with alternative market entry strategies.

One notable limitation is its complexity. The theory involves multiple factors and considerations, making it challenging to apply in real-world scenarios. As a result, it may not provide clear guidance for businesses seeking to make investment decisions in practice. Additionally, eclectic theory may not adequately account for the rapid changes and complexities in the global business environment, which can affect the relevance and applicability of its assumption. However, this theory provides a multifaceted approach to understanding the determinants of FDI.

Conflict Theory*:* Conflict theory, developed by scholars such as Karl Marx, Max Weber, and Ralf Dahrendorf, provides a critical perspective on society. Marx's foundational works, "The Communist

Manifesto" and "Das Kapital," focus on class conflict, inequality, and labor exploitation in capitalist systems (Marx, 1848; Marx, 1867). Weber expanded this analysis in "Economy and Society," examining how power and authority influence organizational dynamics and decision-making (Weber, 1922). Dahrendorf's "class and class conflict in industrial society" further explored class conflict and its role in social change (Dahrendorf, 1959).

Conflict theory argues that society is characterized by inherent conflicts and inequalities rather than harmony. It posits that these conflicts arise from disparities in power, resources, and opportunities, leading to struggles between different social groups, such as economic classes, ethnicities, or genders. A key element of conflict theory is the recognition of structural inequality, where resources and opportunities are unevenly distributed and concentrated among specific groups, reinforcing social hierarchies. The theory emphasizes power struggles, with dominant groups seeking to maintain their advantages and subordinate groups challenging these imbalances. Conflict theory also highlights that societal change often results from these power struggles and resistance. It encourages a critical examination of societal norms, institutions, and established systems, questioning the legitimacy of existing structures and emphasizing the role of power in shaping social relations.

A notable limitation of conflict theory is its heavy focus on conflict and inequality, potentially overlooking other factors influencing social structures and interactions. Despite this, the theory provides valuable insights into class struggle, particularly the ongoing conflict between the capitalist class, which controls production, and the working class, which provides labor. This class struggle is seen as a key driver of social change.

Empirical Review

The interaction of insecurity, institutional quality, and foreign direct investment (FDI) represents a critical relationship that influences a nation's socioeconomic landscape. Recent empirical studies have consistently revealed that insecurity and institutional quality are major

determinants of foreign direct investment (Okafor et al., 2021; Adeleke et al., 2022; Nwokoye & Oladimeji, 2023). These studies indicate that as countries grapple with security challenges, the quality of their institutions becomes a pivotal factor shaping the investment climate, particularly in attracting or deterring foreign direct investment.

While many studies suggest that insecurity has a negative impact on foreign direct investment (FDI), the empirical literature presents mixed findings, with some research indicating that the effect of insecurity on FDI may vary depending on factors such as the type of insecurity, the sector of investment, and the geographical context (Collier & Duponchel, 2013; Ajide & Raheem, 2016; Bello-Schünemann et al., 2017). Most studies show that political instability, violence, and terrorism have detrimental effects on FDI (Chen & Kumar, 2015; Okafor et al., 2021; Adeleke et al., 2022; Nwokoye & Oladimeji, 2023). These conditions create an unpredictable business environment, where the likelihood of sudden policy changes, disruptions to operations, and threats to the safety of assets and personnel are significantly heightened. As a result, foreign investors may perceive the potential costs and risks of investing in such environments as outweighing the benefits, leading to a reduction in FDI inflows. Other studies, however, suggest that certain types of insecurity do not significantly deter FDI, particularly in industries where foreign investors have high risk tolerance or where the expected returns are exceptionally high. For example, oil and gas investments in conflict-prone areas may continue despite insecurity due to the high profitability and strategic importance of these resources (Ezeoha & Ugwu, 2020; Nwogwugwu & Maduka, 2022; Shittu et al., 2023). These studies indicate that the significant returns and essential nature of energy resources often lead companies to adopt risk mitigation strategies, such as security investments or insurance, to continue operations even in unstable environments. The extant literature has also revealed that the impact of insecurity on FDI can vary by region. In some African countries, despite ongoing conflicts or political instability, FDI inflows remain relatively stable, often due to the

presence of valuable natural resources (Beny, 2012; Nnaji, 2020; Adebayo & Kusi, 2021; Osei et al., 2022). Conversely, in regions where insecurity is pervasive and affects broader socioeconomic stability, FDI tends to decline sharply (Dupasquier & Osakwe, 2006; Ogbuabor & Ugwu, 2020; Ojo et al., 2021; Akinwande & Siyanbola, 2022).

The relationship between institutional quality and FDI is complex and can vary depending on the specific context, including the type of institution, the region, and the nature of the investment. Many existing studies agree that high institutional quality, characterized by good governance, effective legal systems, and efficient regulatory frameworks, generally enhances FDI attractiveness. Strong institutions reduce the risks associated with corruption, legal disputes, and policy unpredictability, making a country more appealing to foreign investors (Dunning, 2016; Egger & Winner, 2005). This view is supported by empirical research indicating that improved institutional quality correlates with increased FDI inflows (Cheng & Kwan, 2021; Feng & Zhang, 2022; Jin & Zhang, 2023; Wang & Chen, 2023). Some studies suggest that the impact of institutional quality on FDI may vary across different sectors. For example, while strong institutions may significantly attract FDI in industries requiring high levels of legal protection and regulatory certainty (e.g., manufacturing, services) (Cheng & Kwan, 2021; Feng & Zhang, 2022; Jin & Zhang, 2023), the effect may be less pronounced in sectors where investors have higher risk tolerance or where resources are a primary driver of investment (Bénassy-Quéré et al., 2007; Busse & Hefeker, 2007). In resource-rich countries, FDI might flow into these sectors despite weaker institutions due to the high value of natural resources (Ali, 2016). Other empirical studies argue that institutional quality alone might not be a decisive factor in attracting FDI. For example, in some conflict-affected regions or economies undergoing transition, investors might prioritize other factors, such as market size or resource availability, over institutional quality (Gani & Clemes, 2012; Li & Resnick, 2003).

A close examination of the empirical review revealed that while existing empirical studies (Cheng & Kwan, 2021; Feng & Zhang, 2022; Jin & Zhang, 2023; Wang & Chen, 2023; Dupasquier & Osakwe, 2006; Ogbuabor & Ugwu, 2020; Ojo et al., 2021; Akinwande & Siyanbola, 2022) provide valuable insights into the relationships among insecurity, institutional quality, and foreign direct investment, there appears to be a gap in mixed empirical findings due to regional and sectoral variations. The institutional environment that determines the flow of FDI varies across countries, and as such, the validity of cross-country studies becomes questionable (Deaton, 1989). An investigation into the country-specific effects of institutional quality on FDI becomes paramount. Furthermore, a critical examination of the studies reviewed shows that none of these studies assessed the interaction of insecurity and institutional quality, as they affect foreign direct investment.

3. Methodology

Data and Variables

This study utilized time series data covering the period from 1996--2022. This timeframe was selected because of the availability of relevant data and its significance in reflecting changes in Nigeria's insecurity and institutional quality, as well as evolving trends in foreign direct investment (FDI). The dependent variable is FDI, measured as the naira value of foreign investments in various sectors of the Nigerian economy. These investments may include the creation of new businesses, the acquisition of existing firms, or investments in infrastructure projects" (UNCTAD, 2023; CBN, 2022). Data on FDI were sourced from the Central Bank of Nigeria's statistical bulletin. The independent variables include insecurity and institutional quality. Insecurity is proxied by the Terrorism Index (TI), a quantitative measure of terrorist activity levels in Nigeria, with data sourced from the Institute for Economics and Peace (IEP). Institutional quality is captured via several variables: rule of law (RL), political stability and lack of violence (PSV), government effectiveness (GE), control of corruption (CC), voice and accountability (VA), and regulatory

quality (RQ). These variables are used both individually and in aggregate form to assess their distinct and combined effects, alongside insecurity, on FDI inflows into Nigeria. Data on institutional quality variables are sourced from the World Bank's World Governance Indicators.

Model specification

This study is based on examining the impact of insecurity and institutional quality on foreign direct investment (FDI) in Nigeria. The theoretical foundation for this study is drawn from North's (1993) theory of new institutions, which posits that investors are more inclined to commit their resources when they have confidence in the legal and regulatory framework, as well as the stability of property rights. Building on this premise, a simple functional model can be developed, where investment is a function of the quality of institutions, as illustrated below:

$$INVT = f(QINST) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where INVT =Investment and QINST = Institutional Quality.

Two models can be extracted from the theoretical model in equation (1) on the basis of the objectives of the study. First, given that the current study is biased toward the foreign direct aspect of investment and decomposes the quality of institutions into institutional variables of voice and accountability, political stability and lack of violence, government effectiveness, regulatory quality, rule of law, and control of corruption while also including the terrorism index as a proxy for insecurity, we have

$$FDI = f(VA, PSV, GE, RQ, RL, CC, TI) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where FDI = foreign direct investment, VA = voice and accountability, PSV = political stability and lack of violence, GE = government effectiveness, RQ = regulatory quality, RL = rule of law, CC = control of corruption and TI = terrorism index.

Second, the current study seeks to examine how institutional quality (a moderation variable) moderates the effect of insecurity on foreign direct investment in Nigeria. The simple functional model can be written as

$$FDI = f(TI, TI \times QINST) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

The econometric form of equation (2) can be represented as

$$FDI_t = \alpha_0 + \alpha_1 VA_t + \alpha_2 PSV_t + \alpha_3 GE_t + \alpha_4 RQ_t + \alpha_5 RL_t + \alpha_6 CC_{t_t} + \alpha_7 TI_t + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

To linearize FDI, which is assumed to be nonlinear in nature, we take a partial (natural) logarithm of the variable and respectively the model as shown in equation (5):

$$LN\text{FDI}_t = \alpha_0 + \alpha_1 VA_t + \alpha_2 PSV_t + \alpha_3 GE_t + \alpha_4 RQ_t + \alpha_5 RL_t + \alpha_6 CC_{t_t} + \alpha_7 TI_t + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Ln=Natural logarithmic sign, t = time period, $\varepsilon_{t.}$= stochastic error term at time t, where

α_1 to α_7 are the coefficients to be estimated, α_1 to α_6 are expected to be positive while and α_7 is is expected to be negative.

Method of Data Analysis

The study employed econometric techniques such as the unit root test, cointegration test, and vector error correction model (VECM) to analyze the data. The augmented Dickey–Fuller (ADF) test was used to explore the stationary properties of the time series under consideration. The Johansen integration test was used to examine whether there is a long-run relationship among the variables. The inclusion of an error correction mechanism (ECM) is essential for modeling the dynamic relationship, allowing the vector error correction model (VECM) to capture both short-run and long-run dynamics by rectifying disequilibrium errors. The choice of employing a VECM is contingent upon the stationarity properties of the series. Given that the series are integrated of order one, the VEC

framework is appropriate for the estimation of the dataset. The proposition of short- and long-term dynamics serves as a means to identify disequilibrium errors and provides insights into the time required for their correction. To align with theoretical expectations, the VECM coefficient is expected to be negative, significant, and within the range of $0 < ECM < 1$.

Thus, the error correction model for the first model is specified as:

$$\Delta \mathrm{InFDI}_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\, \Delta \mathrm{InFDI}_{t-i} + \sum_{t=1}^{p} \beta_{2i}\, \Delta \mathrm{VA}_{t-i} + \sum_{t=1}^{p} \beta_{3i}\, \Delta \mathrm{PSV}_{t-i} + \sum_{t=1}^{p} \beta_{4i}\, \Delta \mathrm{GE}_{t-i} + \sum_{t=1}^{p} \beta_{5i}\, \Delta \mathrm{RQ}_{t-i} + \sum_{t=1}^{p} \beta_{6i}\, \Delta \mathrm{RL}_{t-i} + \sum_{t=1}^{p} \beta_{7i}\, \Delta \mathrm{CC}_{t-i} + \sum_{t=1}^{p} \beta_{8i}\, \Delta \mathrm{TI}_{t-i} + \Omega_1 \mathrm{ECM}_{t-1} + \mu_{1t} \quad ----------(6)$$

$$\Delta VA_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\, \Delta InFDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\, \Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\, \Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\, \Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\, \Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\, \Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\, \Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\, \Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} \quad ----(7)$$

$$\Delta PSV_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\, \Delta \ln FDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\, \Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\, \Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\, \Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\, \Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\, \Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\, \Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\, \Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} ----(8)$$

$$\Delta GE_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\, \Delta InFDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\, \Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\, \Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\, \Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\, \Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\, \Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\, \Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\, \Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} ----(9)$$

$$\Delta RQ_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\, \Delta InFDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\, \Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\, \Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\, \Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\, \Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\, \Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\, \Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\, \Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} - - - -(10)$$

$$\Delta RL_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\, \Delta InFDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\, \Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\, \Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\, \Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\, \Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\, \Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\, \Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\, \Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} - - - - (11)$$

$$\Delta CC_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\,\Delta InFDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\,\Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\,\Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\,\Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\,\Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\,\Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\,\Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\,\Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} \quad (12)$$

$$\Delta TI_t = \beta_0 + \sum_{t=1}^{p} \beta_{1i}\,\Delta InFDI_{t-i} + \sum_{t=1}^{p} \beta_{2i}\,\Delta VA_{t-i} + \sum_{t=1}^{p} \beta_{3i}\,\Delta PSV_{t-i} + \sum_{t=1}^{p} \beta_{4i}\,\Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i}\,\Delta RQ_{t-i} + \sum_{t=1}^{p} \beta_{6i}\,\Delta RL_{t-i} + \sum_{t=1}^{p} \beta_{7i}\,\Delta CC_{t-i} + \sum_{t=1}^{p} \beta_{8i}\,\Delta TI_{t-i} + \Omega_1 ECM_{t-1} + \mu_{1t} \quad (13)$$

4. Results and Discussion

This section outlines and examines the findings from the models and tests that were estimated.

Preestimation test

Stationarity is crucial in econometrics to ensure the validity of regression analyses. No stationary time series can produce misleading regression results, making it essential to perform stationarity tests to prevent potential inaccuracies (Gujarati & Porter, 2009; Wooldridge, 2015). The study employed the augmented Dickey–Fuller (ADF) test to assess unit roots and identify the order of integration for the variables. The results of the ADF test are shown in Table 1.

Table 1: Unit Root Test Results

Variables	At Levels			At 1st Difference			Level of integration
	t-stat	Crit. value	Prob.(0.05) at 5%	t-stat.	Crit. value	Prob. (0.05)	
LFDI	1.656844	2.971853	0.4414	5.928806	2.976263	0.0000	I(1)
VA	2.331657	2.954414	0.2217	14.15034	2.986225	0.0000	I(1)
PSV	0.612117	1.954414	0.8422	6.047851	2.986225	0.0000	I(1)
GE	0.070205	1.954414	0.6500	7.604651	2.986225	0.0000	I(1)
RQ	1.880650	2.981038	0.3356	6.208117	2.986225	0.0000	I(1)
RL	0.736412	2.981038	0.8202	6.899463	2.986225	0.0000	I(1)
CC	1.505669	2.981038	0.5150	8.849284	2.986225	0.0000	I(1)
TI	2.011999	2.981038	0.2801	5.0940	2.986225	0.0004	I(1)

Source: *Extract from Author's computation from E-views 10*

I(0) indicates that the variable is stationary at levels, whereas I(1) shows that the variable is stationary at the first difference.

Table 1 shows that none of the variables in the series were stationary at their levels, but all became stationary after taking the first difference. Specifically, LFDI, VA, PSV, GE, RQ, RL, CC, and TI exhibited integration of order one. This finding indicates that the conditions are suitable for applying the vector error correction model (VECM) to investigate the effects of insecurity and institutional quality on FDI in Nigeria.

Economic theory posits that relationships between variables, such as foreign direct investment and insecurity, often involve a delay before the effects of one variable are fully realized in another (Enders, 2015; Stock & Watson, 2019). This suggests that the impact of the influencing variables on the dependent variable typically manifests after a certain lag, creating a temporal gap between cause and effect. A summary of the results for determining the optimal lag length criteria is presented in Table 2 below.

Table 2: Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	231.1490	NA	1.52e-16	-13.92908	-10.78760	-13.09565
2	444.0441	141.9301*	4.59e-21*	-26.33701	-20.05406	-24.67014
3	5237.827	0.000000	NA	-420.4856*	-411.0612*	-417.9853*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

The lag length selection criteria presented in Table 2 show a divergence in recommendations among the different methods. The likelihood ratio (LR) and final prediction error (FPE) criteria suggest

a lag length of 2, whereas the Akaike information criterion (AIC), Schwarz criterion (SC), and Hannan–Quinn criterion (HQ) advocate a lag length of 3. Given that three out of the five criteria favor a lag length of 3, it seems reasonable to adopt this lag length for the model. Additionally, both the AIC and the BIC aim to balance the trade-off between bias and variance in model estimation. While a longer lag length may increase variance, it can reduce bias by offering a better fit to the data (Enders, 2014). Consequently, the model for this study uses 3 lags to ensure optimal performance and adequate representation of the data.

The cointegration result illustrates the long-term trends of variables, making it a common method for modeling the enduring relationships among the variables under study. This test evaluates whether a cointegrating equation exists, operating under the null hypothesis that none exists. The estimation of the trace statistic and Max-Eigen statistic is then presented in the provided table.

Table 3 Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.995216	449.9884	159.5297	0.0000
At most 1 *	0.953433	257.6560	125.6154	0.0000
At most 2 *	0.799355	147.2488	95.75366	0.0000
At most 3 *	0.611120	89.42493	69.81889	0.0006
At most 4 *	0.482220	55.42351	47.85613	0.0083
At most 5 *	0.316366	31.72816	29.79707	0.0296
At most 6 *	0.269847	18.03617	15.49471	0.0203
At most 7 *	0.170144	6.714130	3.841466	0.0096

Source: Author's Computation from E-views 10

(*) indicates rejection of the null hypothesis at the 0.05 critical level

The trace statistic results in Table 3 reveal that there are eight cointegrating equations in the model at the 0.05 significance level, indicating a long-run relationship among the study variables. Consequently, we reject the null hypothesis, as the trace statistic values exceed the critical values, with corresponding probability values below 5%. Additionally, the Max-Eigen results, which are also presented in the table below, further support the presence of cointegration.

Table 4: Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.995216	192.3324	52.36261	0.0001
At most 1 *	0.953433	110.4072	46.23142	0.0000
At most 2 *	0.799355	57.82385	40.07757	0.0002
At most 3 *	0.611120	34.00141	33.87687	0.0483
At most 4	0.482220	23.69536	27.58434	0.1457
At most 5	0.316366	13.69199	21.13162	0.3908
At most 6	0.269847	11.32204	14.26460	0.1388
At most 7 *	0.170144	6.714130	3.841466	0.0096

Source: Author's Computation from E-views 10

(*) indicates rejection of the null hypothesis at the 0.05 critical level

The Max-Eigenvalue test results presented in Table 4 show that there are four cointegration equations in the model at the 0.05 significance level. This is evidenced by the Max-Eigenvalue values exceeding the critical value at the 5% significance level. Therefore, the null hypothesis of no cointegration ($r = 0$) is rejected, indicating a long-run relationship between the time series variables.

Long-run Effects of Insecurity and Institutional Quality Variables on Foreign Direct Investment in Nigeria

Having established cointegration among the variables in the model, the Johansen cointegration test was conducted to examine the long-run impact of insecurity on FDI in Nigeria. The results are presented in the table below.

Table 5: Results of the normalized Johansen cointegration test

LN_FDI	VA	PSV	GE	RQ	RL	CC	TI
1.000000	1.133221	4.259296	1.261628	-2.104275	-1.316088	0.772959	1.494047
	(0.09094)	(0.07271)	(0.23406)	(0.09891)	(0.11420)	(0.16641)	(0.07419)

Source: *Author's computation from E-views*

The results from Table 5 reveal that, in the long run, insecurity (represented by the terrorism index) has a negative and significant effect on FDI in Nigeria. Since the Johansen cointegration test result allows the interpretation of the coefficients in reverse form, a unit increase in insecurity will lead to a 1.49% decrease in foreign direct investment in the long run. The negative coefficient indicates that as insecurity (as measured by the terrorism index) increases, FDI decreases. In Nigeria, persistent security challenges such as terrorism, insurgency, communal conflicts, banditry and criminal activities contribute to an environment of uncertainty and instability. Investors may perceive these risks as potential threats to the security of their business, leading them to reconsider or delay investment decisions. This finding is in line with economic theory and is consistent with the empirical findings of Ullah and Rehman (2014), who reported an inverse relationship between terrorist violence and FDI in Pakistan, indicating that terrorist violence and criminal activities reduce investor confidence, ultimately shrinking FDI inflows.

On the basis of the results in Table 5, voice and accountability (VA), political stability and absence of violence (PSV), government effectiveness (GE), and control of corruption (CC) have a negative and statistically significant effect on foreign direct investment (FDI) in the long run. Although this finding may seem unexpected, it implies

that higher levels of voice and accountability, political stability, government effectiveness, and corruption control are associated with a decrease in FDI over the long term. In the Nigerian context, this result suggests that despite ongoing efforts to enhance governance, stability, and regulatory effectiveness, these factors might not be perceived positively by investors or fail to translate into increased FDI inflows effectively.

This surprising outcome could be attributed to persistent challenges within the institutional framework that deter foreign investment, such as bureaucratic inefficiencies, regulatory complexities, or continuing concerns about corruption and political instability. These findings contradict those of Asiedu (2006) and Ajide and Raheem (2016), who reported that improvements in governance and institutional quality, including the enhancement of political stability and corruption control, are positively associated with increased FDI inflows. Conversely, Table 5 indicates that the other institutional quality variables, such as regulatory quality (RQ) and the rule of law (RL), have a positive and significant effect on foreign direct investment in Nigeria, ceteris paribus. The implication of this result is that higher levels of regulatory quality and the rule of law are associated with increased foreign direct investment (FDI) in Nigeria.

In the context of Nigerian institutional quality, this suggests that improvements in regulatory frameworks and adherence to the rule of law can positively influence investor perceptions and confidence, thereby attracting more FDI inflows. Strengthening regulatory institutions and enforcing legal frameworks contributes to a more stable and predictable investment environment, fostering greater investor trust and incentivizing foreign capital inflows. These findings support those of Asiedu (2006) and Ali et al. (2010), who reported that improvements in regulatory quality and the rule of law positively influence foreign direct investment (FDI) inflows.

Error correction results

This study also examined the short-term impact of insecurity and institutional quality on FDI in Nigeria. The ECM results are presented in the table below.

Table 6: Results of the Error Correction Model

Variables	*Coefficient*	*Std. Error*	*t-statistic*
D(LnFDI(-1))	0.144236	0.22757	0.63382
D(TI(-1))	0.314739	0.48367	0.65074
D(VA(-1))	0.443306	0.45211	0.98052
D(PSV(-1))	-1.230721	0.71087	-1.73128
D(GE(-1))	0.567657	1.02980	0.55123
D(RQ(-1))	-0.331762	0.70564	-0.47016
D(RL(-1))	-3.145904	1.26489	-2.48710
D(CC(-1))	2.868096	1.10729	2.59020
ECM (-1)	-0.294989	0.12706	-2.32157

Source: Extracts from E-views Output

The error correction result in table 6 shows negative coefficient of the error correction term (-0.29489). This means that the previous years' deviation from long-run equilibrium is corrected at an adjustment speed of 29%. In other words, in the case of any initial distortions, the system converges toward long-run equilibrium at a speed of 29% within the year. The results from the table also indicate that in the short run, the first lag of FDI has a positive but insignificant effect on the current level of FDI in Nigeria. This result suggests that past FDI inflows tend to have a positive association with current FDI levels, indicating that FDI tends to persist over time. However, the lack of statistical significance implies that global economic conditions or shifts in international investment patterns override the impact of past investment levels on current FDI inflows. Table 6 also indicates that insecurity has a positive but insignificant effect on FDI in the short run. The positive effect implies that despite prevailing insecurity, investors may perceive short-term investment opportunities in Nigeria that outweigh the risks associated with

insecurity. This perception could be driven by factors such as attractive market potential, resource abundance, or high returns on investment in specific sectors. However, while investors may initially perceive short-term opportunities, the translation of these perceptions into concrete investment actions may take time, resulting in insignificant short-term effects on FDI.

Table 6 reveals that in the short run, voice and accountability and government effectiveness have positive but insignificant effects on foreign direct investment (FDI) in Nigeria. This suggests that institutional reforms may signal long-term improvements, but short-term impacts are limited by implementation challenges. Conversely, political stability, lack of violence, and regulatory quality exert a negative but weak effect on FDI, indicating the need for sustained efforts to create a conducive investment climate. Control of corruption significantly and positively influences FDI, showing that minimizing corruption encourages foreign investment. However, the rule of law negatively affects FDI, suggesting that perceived legal weaknesses may deter investors in the short run.

The interactive effect of Insecurity and Institutional quality on Foreign Direct Investment

Understanding the dynamics between insecurity and institutional quality is essential in comprehending their combined impact on foreign direct investment (FDI) in Nigeria. While insecurity poses significant challenges to investment attractiveness, the quality of institutions, such as governance structures and legal frameworks, can either mitigate or exacerbate these challenges. Therefore, analyzing the interactive effects of insecurity and institutional quality can offer insights into how their interplay influences FDI inflows in Nigeria. The results of the interactive effect of insecurity and institutional quality on FDI are presented in Table 7.

Table 7: Results of the interactive effect

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LN_FDI (-1)	0.838254	0.156459	5.357654	0.0000
TI	0.261473	0.390354	0.669834	0.5078
INSTQ	0.208366	1.039170	0.200512	0.8423
TI_INSQ	-0.026824	0.133156	-0.201447	0.8416
C	-1.264386	2.762395	-0.457714	0.6503

Source: Extracts from E-views Output

Table 7 displays the results of the interaction effect of insecurity and institutional quality on FDI in Nigeria. The table shows that both insecurity and institutional quality individually have positive but insignificant effects on FDI, suggesting that while insecurity poses challenges (as indicated by the weak positive effect), strong institutional frameworks alone may not be enough to attract substantial FDI inflows. When their interaction, represented by the moderation effect, is examined, a negative but insignificant impact on FDI is observed. This implies that, despite improvements in institutional quality, particularly in governance and legal frameworks, the ongoing issue of insecurity continues to hinder the investment climate. While strong institutions may provide a basis for investment, their ability to mitigate the negative effects of insecurity on FDI appears limited.

Post Estimation Tests

Diagnostic checks were performed to validate the model's accuracy. These checks included assessing whether the model faced any issues. Residual tests were conducted to evaluate the reliability of the estimates and to determine if the residuals followed a normal distribution. Additionally, these tests aimed to ensure that the estimates would lead to reliable statistical inferences. The results of the residual diagnostics are presented in Tables 8 and 9.

Lag	LRE* stat	df	Prob.	Rao F-stat	df	Prob.
1	123.6482	64	0.2354	2.627199	(64, 69.9)	0.5123
2	216.2001	64	0.1132	8.213026	(64, 69.9)	0.0843
3	191.0247	64	0.2143	6.158828	(64, 69.9)	0.1047

Table 8: VEC residual serial correlation LM tests

Source: Extracts from E-views Output

The Breusch–Godfrey VEC serial correlation LM test results in Table 8 indicate that there is no serial correlation among the study variables, as the probability values are greater than 0.05. This suggests that the residuals of the model are serially independent, with no evidence of spillover effects from the errors.

Table 9: Ramsey VEC residual normality test

Component	Jarque-Bera	Df	Prob.
1	48.21426	2	0.0000
2	103.4998	2	0.0000
3	3.201392	2	0.2018
4	16.91564	2	0.0002
5	0.371951	2	0.8303
6	4.942216	2	0.0845
7	0.548045	2	0.7603
8	44.20943	2	0.0000
Joint	221.9027	16	0.0980

Source: Extractions from E-Views 10 output

The results of the Ramsey regression equation specification error test in Table 9 show that the relationships among the variables were correctly specified given that the joint probability values of the components were greater than the 0.05 probability threshold.

5. Conclusion and policy recommendations

On the basis of the findings of this study, insecurity has divergent effects on foreign direct investment (FDI): a significant negative impact in the long run and a positive but insignificant effect in the short run. Furthermore, the interaction between insecurity and institutional quality has a negative and significant influence on FDI inflows in Nigeria. Consequently, the following recommendations are made. First, government agencies tasked with enhancing institutional quality should focus on capacity-building initiatives to improve regulatory frameworks, legal systems, and governance mechanisms. This can be accomplished through training programs, workshops, and partnerships with international organizations to increase expertise and efficiency. Second, policymakers and security agencies should intensify efforts to address ongoing security challenges in Nigeria. This could involve increasing investments in security infrastructure, deploying advanced technologies for surveillance and intelligence gathering, and enhancing coordination among security forces to more effectively combat crime and insurgency. Finally, there is a need for the constituted authority to simplify bureaucratic procedures, reduce regulatory burdens, and streamlining business processes can significantly increase the ease of doing business in Nigeria.

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