

Causality Relationship between Security Challenges and Investment Potential Growth In Nigeria, 1980 to 2024

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Abstract

This study examined causality relationship between security challenges and investment growth in eight African countries for the period (1980- 2024). The study considered two objectives, to; investigate the direction of causality relationship between security challenges and investment potential growth in Nigeria, determine the effect of security challenges on investment potential growth in Nigeria. Secondary time series data were used to carry out the empirical analysis. The study employed Pair wise Granger Causality Tests, Augmented Dickey-Fuller (ADF), Phillips- Perron tests, Co-integration Test. Based on the above econometric and statistical analyses conducted, it was indicated directional or partial causal relationship between security challenges and investment potential growth in Nigeria. It was also observed that security challenges have significant effect on investment potential growth in Nigeria. Based on these findings, the researcher recommends that; Nigeria government should invest on security through security literacy program as a national strategy for combating insecurity. Government should upgrade more modern internet security infrastructural facilities in partnership with telecommunication companies and other related service providers. Government security authority should build up trust in securities service by fortification of security institutions operating in Nigeria.

Journal of Policy and Development Studies (JPDS)

Vol. 17. Issue 2 (2024)

ISSN(p) 1597-9385

ISSN (e) 2814-1091

Home page

<https://www.ajol.info/index.php/jpds>

ARTICLE INFO:

Keyword:

Causality Relationship, Security Challenges, Investment Potential Growth

Article History

Received: 17th November, 2024

Accepted:

27th December, 2024

DOI:

<https://dx.doi.org/10.4314/jpds.v17i2.10>

1.Introduction

Following the end of the civil war in 1970, Nigeria's security situation was largely stable. People lived in peace and were free to travel across the country without fear of being abducted or attacked. There were no problems between different ethnic groups coexisting; life was accommodating. Everyone tried to earn a living; properties were guarded, thanks to the vigilante efforts of various social groups, law enforcement, and the military. The country's security measures were very well maintained (Gylych, Kemal & Sotonye, 2018).

That being said, there have been notable cases of insecurity in Nigeria since 2014 in a few states, including Borno, Adamawa, Kaduna, Delta, Benue, Zamfara, Kano, and Plateau. However, the state governments' negligence and their failure to act swiftly and boldly in response to the insecurity incident within the stated states government in Nigeria as reported at the time by a constituted security expert caused the insecurity to spread to other areas of the nation. It's possible that the legislators at the time were unable to comprehend the long term negative effects of it. Their actions have recently put the entire population in grave danger, and they seem to have gotten worse as more security investors moved into the country (Azaiki, 2007). According to Adebakin (2012), security can be defined as a nation's ability to safeguard itself, advance and preserve its reputation, uphold moral standards, and improve the well-being of its relatives. It can also be defined as the opportunity to avoid danger or risks. The following summarizes the state of insecurity in Nigeria over the previous fifteen (15) trend reports with other nations and how it impacts people's lives, properties, and growth in investments.

Source: Global Terrorism Index (2020).

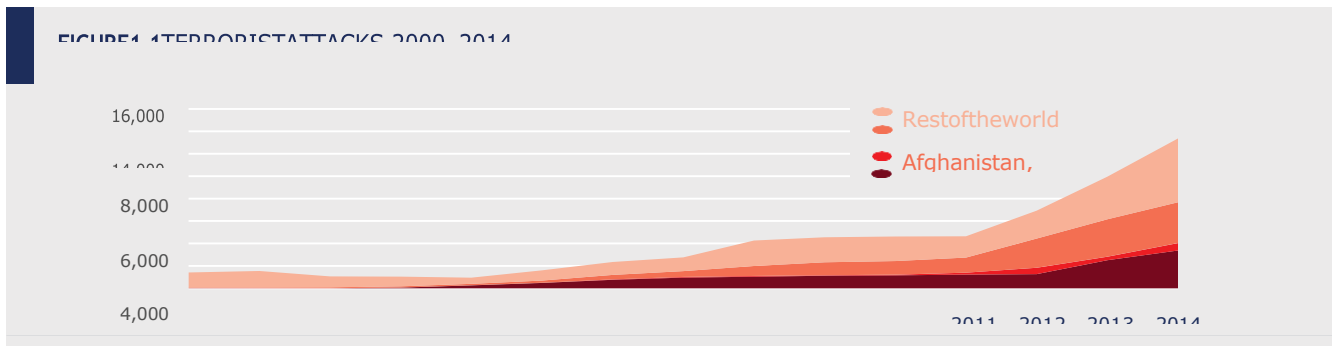


Figure 1.1 shows that majority of terrorist's incident activities and attacks were highly centralized. Iraq, Pakistan, Afghanistan, Nigeria, and Syria accounted for five out of the five countries where there were terrorist attacks in 2014. Terrorist incidents, however, increased by 54% in the rest of the world. After Pakistan and Afghanistan, Iraq accounted for 25% of all incidents. Nigeria saw the fewest deaths 5% but the highest number of fatalities 23%.

On the other hand, the World Bet opinion on venture atmosphere in nine African nations in which it discovered that 29% of business administrators in Africa and 36% in Nigeria saw instability as a noteworthy imperative on investment. This circumstance has the harming outcome of offering sign to the global group that Nigeria is not a sheltered and secure place, and in that capacity not reasonable for venture and business exercises. Outside firms and business visionaries would

decline to invest, and this is especially imperative in perspective of the endeavors being made to make the coveted environment to draw in investment growth (Gylych, Kemal & Sotonye, 2018). Going with the insecurity in the county, one could say that “there might be a decrease in investment growth in Nigeria which including both the domestic and foreign investment potential as results of the security condition of Nigeria. Usually, investment focused on building new industrial facilities or putting resources into new ways of uses or repackaging to add values to it exercises which create employment. Investment growth has been in existence and has become an integral part of the economic activities of any country, as it is seen as a process of moving technology and capital from a nation either developed or developing to another (John, 2016).

Investment growth in a country is often hindered by insecurities, which can drive off investors and negatively impact both domestic and foreign growth. These insecurities can lead to a decrease in investment growth, affecting both domestic and foreign investments. Investment growth is an integral part of economic activities, moving technology and capital from developed to developing nations. Investment growth refers to the investment of money, resources, and technology in enterprises, enabling them to operate and provide goods and services in domestic and foreign markets, and is seen as a panacea for a nation's economic growth and development. Nigeria's population, heavily reliant on foreign goods and services, has attracted significant foreign investment, with the country ranking as the nineteenth most significant recipient of foreign investment globally (United Nations Conference on Trade and Development (UNCTAD), (2021). Nigeria's population, heavily reliant on foreign goods and services, has attracted significant foreign investment, with the country ranking as the nineteenth most significant recipient of foreign investment globally. The Central Bank of Nigeria reported an average annual foreign investment of \$11184.0 million between 2015 and 2022. However, the 2022 report showed a 78.1 per cent decrease in outside direct investment and a 87.2 per cent expansion in portfolio investments. However, the degree by which these security challenges affect on investment growth in Nigeria is what the public is yet to know. This study therefore, sought to examine security challenges and its causality relationship with investment growth in Nigeria.

1.2 Statement of Problem

Since the early years of military rule, when weapons were imported for use in the civil war and afterwards, Nigeria's security has been a source of concern. Later, ex-military personnel and civilians used these weapons for armed robberies. Banditry and Boko Haram pose serious threats to the security of the northern zone. This has led to low agricultural production in Benue and other north-central states. Prolonged insecurity has also depressed both local and foreign investors and consumer confidence, reducing investment growth volume. Insecurity affects individual spending, businesses, and the level of investment in Nigeria. These issues have significant implications for the country's economic growth and development (Olabanji and Ese 2014) cited in Okonkwo, Ndubuisi and Anagbogu (2015).

It is significant to note that "resource seeking inflows in the oil and gas sector" were the primary cause of the 71% spike in the decline in foreign investment in 2022. While general insecurity in

Nigeria continued to decline in foreign investment, it is not surprising that the oil and gas sector flourished and led to an increase in foreign investment inflows given the sharp decline in attacks against oil installations in the country's Niger Delta (United Nations Conference on Trade and Development (UNCTAD), 2022).

As a result, Nigerian insecurity has both caused and encouraged the government to spend disproportionately on defense in comparison to other economic sectors. Naturally, the government has been spending hundreds of billions of naira on defense and security-related expenses in response to the growing insecurity in Nigeria. These are substantial sums of money that ought to have been used in the economy in other areas, particularly the fields of health and education. As long as the majority of this enormous defense spending comes from foreign procurement, which might not be beneficial for the expansion of Nigeria's economy, the impact on the domestic economy is further diminished Adebukola (2022).

The insecurity industry has become a massive one, with powerful individuals perpetuating it for their own profit. This has led to a decline in productivity and diminished public confidence in the government. The government's inability to bring an end to insecurity can lead to a feeling of helplessness and hopelessness, particularly in vulnerable areas and among victims and their families (Omole, (2021).

This adds even more fuel to the helplessness. Additionally, Nigeria is losing out on a lot of foreign investment opportunities in a variety of business sectors since people are afraid to travel around freely in the nation. Nigeria's tourism industry has been negatively impacted by the ongoing insecurity in the nation, potentially leading to a situation of national isolation. Visitors don't go to dangerous locations. Many nations have advised their citizens not to travel to many parts of Nigeria due to the country's insecurity. For example, British nationals are advised by the British Foreign and Commonwealth Office (FCO) not to travel to sixteen states in Nigeria. Traveling through the remainder of the nation should also be done with extreme caution. Given this grave warning, fewer foreign visitors will choose to visit Nigeria. (Omole,2021), (Naidu, 2022).

This study aims to examine the relationship between security challenges and investment growth in Nigeria, highlighting the significant impact these issues have on the economy. Security challenges have led to businesses closing down operations and relocating to other African countries, affecting investment and business confidence. The extent of these challenges' impact on Nigerian investment growth remains unknown.

1.3 Objectives of the Study

The broad objectives are to:

1. Determine the direction of causality relationship between security challenges and investment potential growth in Nigeria.
2. Investigate the Determine the effect of security challenges on investment potential growth in Nigeria.

1.5 Hypotheses

H01: There no causality relationship between security challenges and investment potential growth in Nigeria.

H02: Security challenges have insignificant effect on the investment potential growth in Nigeria.

3. Review of Related Literature

Conceptual Frame work

Insecurity

A sense of uncertainty and inadequacy, or not being good enough, is called insecurity. It causes worry about your objectives, interpersonal connections, and capacity to handle particular circumstances. Everyone experiences insecurity occasionally. It originates from a multitude of sources and can manifest in every aspect of life. It could originate from a traumatic incident, past experience patterns, social conditioning (picking up rules from watching others), or local settings like the workplace, home, or school (Daniel, 2020).

Kidnapping

Even though kidnapping originated in the oil-rich Niger Delta region as a means of confronting the willful disregard for their communities by succeeding administrations, it has since expanded to become a multimillion-naira industry that is currently flourishing outside of the region. According to Nwagboso (2017), kidnapping has become a tactic used in the southeast to settle political and personal scores. Aside from the financial benefits of the ransom paid to the victims' families, which are typically in the millions of naira, many desperate politicians in Igbo land are now using kidnapping as a means of retaliation against those they view as political rivals. Because of kidnapping, Nigerians are always afraid. Living has steadily descended into the Hobbesian state of nature, where life is harsh, unpleasant, and brief, even in the northern regions of the nation where the wave of kidnapping is not as widespread.

Boko Haram

This Islamic religious group first gained notoriety in 2002 when reports of its presence in Gwoza, Borno state, Nwanegbo and Odigbo 2020, as well as Kanama (Yobe state), were made. "Jamallatul Alhul Sunnah Lidda "wati wal Jihad," which translates to "people committed to the propagation of the Prophet's teachings and jihad," is the official name of "Boko Haram," which in the Hausa language of the region means "western education is forbidden" (Mechan and Speier, 2017). The controversial Boko Haram militant Islamist group in Nigeria aims to impose Sharia law in the country's northern states. From an ideological standpoint, the group is against modern science, western culture, and western education (Beland, 2018). The actions of the Boko Haram organization pose significant threats to Nigeria's security in the modern era. The actions of these individuals have caused investors to seriously doubt the security of their investments in Nigeria. In Nigeria, particularly in the north of the country, it has also put many businesses' existence and survival in jeopardy. These include, among other things, the murder of defenseless Nigerians, the rape of women, and the bombing of important police stations and cities in the country's north, notably Borno, Kano, Bauchi, Niger, Yobe, Adamawa, and Abuja (Nwagboso, 2017).

The Simple Accelerator Theory of Investment

The roots of the accelerator model can be traced back to Clark (1917), who proposed that the demand for fixed investment isn't determined by the volume of demand for the final product, but rather by the acceleration of aggregate demand. The basic accelerator theory posits that an increase in a firm's output or demand will lead to a proportional increase in business equipment spending. Consequently, the greater the firm's output and sales relative to its capacity utilization, the more it will invest in fixed assets.

Assuming a constant capital-output ratio represented by λ , the optimal capital stock (C^*) in any period t_m is a constant proportion of the firm's output (Q_{t_m}), expressed as $C^* = \lambda Q_{t_m}$. The accelerator theory emphasizes the connection between the capital stock (C^*) and the output flow (Q_{t_m}), indicating that the demand for capital goods originates from direct demand on national output. Thus, variations in a firm's output lead to changes in the demand for business equipment and machinery. In the context of firms aiming to adjust their fixed capital stocks to desired levels for future periods, the fixed investment behavior can be expressed as $I_{t_m} = \delta(Q_{t_m} - C_{t_m})$, where δ represents the adjustment rate. This equation simplifies further when considering that $C_{t_m} = C^*$.

The simple accelerator model operates on the premise that firms invest in new business equipment to expand output, with fixed investment being proportional to the anticipated increase in output for the subsequent period. When firm prices are held constant and factors such as business expectations, profitability, and borrowing costs are considered negligible in investment decisions, the accelerator theory aligns closely with a basic Keynesian model of investment behavior (Joe, 2019).

The Neoclassical and Modified Theory of Fixed Investment Behavior

In developing the neoclassical model, Jorgensen (1963) established several crucial assumptions. These assumptions include: efficient utilization of fixed capital by firms; presence of diminishing returns to capital and labor; absence of adjustment costs to the firm; full employment in the economy with flexible prices for labor and capital; and existence of perfect financial markets where firms can borrow and lend at given interest rates. Additionally, the model assumes the existence of a putty-putty firm capital, implying that once a firm makes a fixed investment decision, it can instantly adapt the same investment to different technologies without incurring further costs. This assumption suggests that a firm's investment decisions primarily depend on the cost of capital rather than the technology used in the manufacturing process.

Furthermore, the neoclassical investment theory assumes that real financial decisions made by the firm are separate from its investment decisions, and that the price of fixed investment equals the discounted value of the rental charges or user cost of capital. According to Jorgenson (1963), the flow of net receipts from fixed investments (R_s) at a given time t_m is determined by various factors including the firm's output (Q), output price (pr), labor (L), wage rate (wg), investment rate (I), and price of capital goods (qy). The neoclassical theory posits that a private firm aims to maximize the discounted value of net cash flows subject to technological constraints. This objective leads to the maximization of the present value (PV) of future cash flows, subject

to investment constraints. These constraints include the rate of depreciation attached to business equipment (δ), and the firm's production function, which relates output (Q), capital (C), and labor (L).

The optimal capital stock of the firm is primarily determined by the user cost of capital, which is influenced by the relative price of output and capital. Empirical studies suggest that the Cobb-Douglas production function is a good approximation of how the economy converts physical capital and labor into goods and services. The real benefit of a unit of capital, known as the marginal product of capital (MPC), is crucial in determining a firm's output and desired fixed capital stock. The MPC indicates the increase in output produced by using one additional unit of capital in production. Higher production levels lead to a rise in the desired fixed capital stock; while a higher real cost of capital reduces it. Several factors contribute to a firm's cost of fixed capital, including the real procurement price of equipment and machinery, financing costs, tax rates, depreciation rates, investment tax credits, and expected present value of depreciation allowances and other investment incentives. The marginal cost of finance should equal the shareholder's opportunity cost of capital, influencing firms' investment decisions.

The neoclassical model also illustrates the relationship among private fixed investment behavior, tax rates, and interest rates. Changes in these rates affect the cost of capital, impacting firms' decisions regarding fixed investment spending on capital goods.

Overall, the neoclassical theory predicts that profit-maximizing firms will invest in the capital stock until the expected marginal return of capital equals its marginal costs or when the net present value is zero. This leads to a long-run steady state relationship between the firm's optimal fixed capital stock, production levels, real user cost of capital, and elasticity of substitution. While increasing revenues or rising output prices encourage more demand for business machinery and equipment, rising interest rates and borrowing costs, reduced investment tax credits, and other factors may discourage private fixed investment spending on capital goods (Joe, 2019).

Investment in Keynesian Theories

According to Trygve (1960), the macroeconomic models that emerged post the Great Depression witnessed a significant shift in perspective regarding the welfare implications of investment rates. Investment's role as a driver of growth was largely supplanted by its role in determining current employment levels. This shift was understandable given the prevailing economic conditions where existing productive resources remained underutilized.

Consequently, increasing production capacity through investment could be seen as counterproductive, potentially exacerbating unemployment issues. In these macroeconomic models, investment theory elements could be categorized into theories on the effects of investment rates, determinants of investment activity levels, and factors influencing variations in these levels. Perhaps a fourth category could be added: theories examining the effects and desirability of autonomous public investment. The macroeconomic theories regarding the impact of investment levels on output and employment primarily revolved around the concept of "multipliers." These theories suggested that investment was the active force determining the economy's total savings potential. Given consumer behavior patterns, the demand for consumer

goods and output levels were assumed to be determined by investment, with producers playing a relatively passive role. With the main concern being the limited level of investment activity, attention focused on optimizing the utilization of investment for total employment benefits. This raised questions about income redistribution effects, the impact of cash reserves on consumer spending propensity, and other related issues.

The theory of private investment determinants posed challenges, as classical capital theories couldn't address the issue of "insufficient demand for investment." Attempts to derive investment demand based on capital profitability encountered confusion, as increased earning potential from capital use didn't directly translate to increased capital accumulation speed. Efforts were made to clarify this aspect in subsequent studies. In Keynesian models, the interpretation of "investment opportunities" varied, leading to differing views on the demand for investment. Factors influencing investment were numerous, with interest rates, existing capital levels, and economic activity being commonly cited. Short-term fluctuations in investment activity posed additional challenges, with expectations playing a significant role. Expectations were highlighted as crucial by model-makers, yet their precise influence remained unclear. Expectations needed a known relation to predict future behavior accurately. Additionally, deficit government spending doctrines intersected with investment theory, with direct and indirect relations observed between them. Government deficit spending could stimulate capital growth, either through public or private investment. However, perspectives on deficit spending varied, ranging from creating capital to generating purchasing power. If deficit spending led to hoarded purchasing power, it represented a unique form of investment, contributing to private wealth accumulation. This unconventional form of investment blurred the line between real investment and wealth preservation. Incorporating such "investment" into annual economic net investment further complicated the relationship between investment and capital increase. The notion of investment serving purposes other than capacity expansion or value storage was attributed to organizational flaws in the economic system rather than inherent human economic behavior challenges.

Empirical Literature review

Iferenta, Akujuru, and colleagues (2023) investigated the connection between Kaduna State's insecurity and conflict management tactics between 2010 and 2021. In conflict management, negotiation, mediation, conciliation, and arbitration are the study variables. Primary sources were used by the researchers to gather data for the study, which was conducted using a quasi-experimental design method. The mean and standard deviation were used to analyze the study data. The study's reviewed findings indicate that conflicts have a significant impact on socioeconomic development. The researchers came to the subsequent conclusion that there is a substantial correlation between Kaduna State, Nigeria's insecurity and the conflict management strategies of negotiation, mediation, arbitration, and conciliation.

Adebukola (2022) looked at Nigerian investment patterns and the nature and trend of insecurity between 1999 and 2014. Both primary and secondary data were used in the study. The theoretical

framework of the liberal transnational political economy perspective was adopted by the study. Both qualitative and descriptive methods were used to analyze the data. The findings demonstrated that, during the studied period, patterns of foreign direct investment in Nigeria both in the oil and non-oil sectors were adversely affected by the nature and trend of insecurity.

The 2022 study by Taiwo James Odebola looked at how the Boko Haram insurgency affected Nigeria's economy between 1960 and 2017. A number of variables, including Boko Haram terror, GDP, exchange rates, interest rates, inflation rates, balance of payments, oil prices, the agricultural and oil sectors, and international trade, were examined in the study using secondary data. According to the findings, Boko Haram was a major factor in the economic downturn that occurred between 2016 and 2017. In order to promote steady growth in the face of terrorism, the study suggested expanding the service sector and depreciating the currency.

According to Nwokwu and Ogayi's (2021) analysis of Nigeria's socioeconomic growth between 1990 and 2020, security threats include terrorist attacks by Boko Haram, foreign direct investment, Niger Delta militancy, and widespread participation in governance. In order to achieve peaceful coexistence, the researchers advise tackling the underlying causes of insecurity, changing national policies to foster loyalty, and reorganizing security agencies to gather intelligence proactively.

In Iyaji's (2021) investigation titled "Insurgency, Political Risk, and Investment Inflows in Nigeria: A Sectorial Analysis from 2008Q1 to 2017Q4," the fully modified ordinary least squares (FMOLS) technique was utilized to estimate empirical models. The findings indicate that terrorism negatively impacts investment inflows into the telecommunication sector, whereas corruption has a positive effect on investment in the oil and gas sector. Consequently, the study suggests enhancing efforts in combating terrorism and strengthening anti-corruption agencies to bolster Nigeria's appeal to foreign direct investment.

Plangshak Musa Suchi (2019) examined the repercussions of investment in state security forces on African states' ability to address broader human development challenges, with Nigeria as the empirical focus. It scrutinized Nigeria's response to contemporary security issues, highlighting the substantial resources allocated to security forces since independence at the expense of addressing fundamental human development issues such as poverty, healthcare, education, unemployment, and corruption. The article emphasized the detrimental effects of counter insurgency expenditures on other development sectors.

Kiabel and Efeeloo (2018) explored the impact of insecurity costs on the profitability of construction companies in Nigeria's Niger Delta region. Utilizing questionnaire data analyzed through descriptive statistics and Pearson correlation, the study revealed significant negative relationships between insecurity costs such as kidnapping and militancy and the profitability metrics of construction firms. The study recommended government intervention to improve infrastructure and enhance security measures to mitigate the adverse effects of insecurity on business profitability.

Radi (2018) investigated the effect of terrorism on foreign direct investment (FDI) in Nigeria from 1980 to 2017 using a dynamic panel data model. While no significant impact of terrorism on

tourism investment was found, the study highlighted the positive influence of international tourist arrivals and ease of doing business on FDI inflows in the tourism sector.

3. Methodology

Research Design

The study employed a historical research design also known as the ex-post facto. In the study, the economy of Nigeria was examined with reference to; “security challenges and investment growth in Nigeria 1980-2024”, as postulated by the theoretical foundation and espoused in analytical framework explored. However, these econometric approaches include; Unit Root Test, Co-integration Test, Vector Auto-regressive Model (VAR) Causality Test and other diagnostic test where estimated using E-views econometric analyses package.

Theoretical Framework

The eclectic paradigm Dunning (2001) describes the eclectic paradigm as “a framework for analyzing the determinants of international production”. The paradigm contains the Ownership-specific advantages, Location-specific advantages and Internalization advantages. According to the model these three set of advantages determine the firm’s investment internationalization process (Dunning, 1988). The eclectic paradigm is a useful framework for firms that seek international expansion through Foreign Direct Investment (Dunning, 2001). The ownership-specific advantages are valuable assets (patent, brand name, trademarks e.g.) first developed in the firm’s home country and thereafter, depending on the location-specific advantages, expanded abroad (Rugman, 2010; Dunning, 1980). The more assets with ownership specific advantages the firm acquire, the greater probability of the firm going abroad (Dunning, 1980). The location specific advantages describe the likelihood of the firm finding a foreign market attractive, if the firm is able to exploit its resources in the specific location there will be a greater probability that the firm will engage in Foreign Direct Investment (Dunning, 2000). Lastly, the internalization advantages refer to the desire to maintain the assets internally or whether to outsource them (Dunning, 1980).

On the other hand, Tallman (1988) augured on the effect of economical, political conditions, and investment risk of home country and outward foreign direct investment (FDI). Tallman concluded that the political, security, investment risk and economic conditions of the home country are important for the process of both domestic and foreign direct investment decision. The economic development level of the home country (defined as GDP per capita) is an important determiner of the direct investment level. To this effect, security, corruption in the host country does have any significant effect on foreign direct investment. However, the framework explains how the chosen theories in this paper are connected to each other. Moreover, research shows that an increasing number of terrorist activities and their operations, which consequently leads to the definition of insecurity. The literature review proposes that insecurity of firms constitutes an incremental engagement in their investment potentials. Together these theoretical concepts constitute

a foundation for which our research “security challenges and investment growth anchored on; eclectic theory Dunning (2001) and the model developed theory Tallman (1988).

Model Specification

In this paper, we used aggregate investment growth (AIG) as a function of these independent variables

$$\text{Therefore: } \text{AIG} = \beta_0 + \beta_1 \text{ ITR} + \beta_2 \text{ UER} + \beta_3 \text{ PCI} + \beta_4 \text{ ARI} + \beta_5 \text{ TRI} + \mu$$

Where: AIG is the aggregate investment growth, (ITR) is interest rate (UER) is Unemployment rate, Nigeria Poverty rate measured by per capital income (PCI), (CRI) is Corruption Rate index, while insecurity variables were; (ARI) is Armed Robbery index and (TRI) is Terrorism and Kidnapping index in Nigeria.

Table 1: A Priori Expectations

Independent variables	Priori Expected assumption to the dependent variable (CPI)
PCI, ITR	Positive ($\beta_1 > 0$) to AIG
CRI,	Negative ($\beta_2 < 0$) to AIG
ARI, TRI	Negative ($\beta_3 > 0$) to AIG

VAR model for Equation

$$\begin{aligned} \Delta \text{AIG}_t &= \sum_k^r \lambda_k v_{kt-1} + \sum_{s=1}^p \alpha_{1,s} \Delta \text{ITR}_{t-s} + \sum_{s=1}^p \alpha_{2,s} \Delta \text{PCI}_{t-s} + \sum_{s=1}^p \alpha_{3,s} \Delta \text{CRI}_{t-s} + \sum_{s=1}^p \alpha_{4,s} \Delta \text{ARI}_{t-s} + \sum_{s=1}^p \alpha_{5,s} \Delta \text{TRI}_{t-s} + \zeta_{1,t} \\ \Delta \text{ITR}_t &= \sum_k^r \lambda_k v_{kt-1} + \sum_{s=1}^p \beta_{1,s} \Delta \text{AIG}_{t-s} + \sum_{s=1}^p \beta_{2,s} \Delta \text{PIC}_{t-s} + \sum_{s=1}^p \beta_{3,s} \Delta \text{CRI}_{t-s} + \sum_{s=1}^p \beta_{4,s} \Delta \text{ARI}_{t-s} + \sum_{s=1}^p \beta_{5,s} \Delta \text{TRI}_{t-s} + \zeta_{2,t} \\ \Delta \text{PIC}_t &= \sum_k^r \lambda_k v_{kt-1} + \sum_{s=1}^p \delta_{1,s} \Delta \text{AIG}_{t-s} + \sum_{s=1}^p \delta_{2,s} \Delta \text{ITR}_{t-s} + \sum_{s=1}^p \delta_{3,s} \Delta \text{CRI}_{t-s} + \sum_{s=1}^p \delta_{4,s} \Delta \text{ARI}_{t-s} + \sum_{s=1}^p \delta_{5,s} \Delta \text{TRI}_{t-s} + \zeta_{3,t} \\ \Delta \text{CRI}_t &= \sum_k^r \lambda_k v_{kt-1} + \sum_{s=1}^p d_{1,s} \Delta \text{AIG}_{t-s} + \sum_{s=1}^p d_{2,s} \Delta \text{ITR}_{t-s} + \sum_{s=1}^p d_{3,s} \Delta \text{PIC}_{t-s} + \sum_{s=1}^p d_{4,s} \Delta \text{ARI}_{t-s} + \sum_{s=1}^p d_{5,s} \Delta \text{TRI}_{t-s} + \zeta_{4,t} \\ \Delta \text{TRI}_t &= \sum_k^r \lambda_k v_{kt-1} + \sum_{s=1}^p d_{1,s} \Delta \text{AIG}_{t-s} + \sum_{s=1}^p d_{2,s} \Delta \text{ITR}_{t-s} + \sum_{s=1}^p d_{3,s} \Delta \text{PIC}_{t-s} + \sum_{s=1}^p d_{4,s} \Delta \text{CRI}_{t-s} + \sum_{s=1}^p d_{5,s} \Delta \text{ARI}_{t-s} + \zeta_{4,t} \end{aligned}$$

Granger Causality Test

To determine the causal elements in our analysis, we specify the model for granger causality test.

This is carried out based on the following equations:

$$(\text{AIG}_t \rightarrow \text{ITR}_t, \dots \text{TRI}_t)$$

$$\text{AIG}_t = \sum_{i=1}^n \beta_i \text{AIG}_{t-i} + \sum_{j=1}^n \lambda_j \text{ITR}_{t-j} + \dots + \sum_{u=1}^n \lambda_u \text{TRI}_t + U_{1t}$$

$$(\text{TRI}_t, \dots \text{ITR}_t \leftarrow \text{AIG})$$

n

n

n

$$TRI_t = \sum_{i=1} \beta_i TRI_{t-i} + \sum_{j=1} \lambda_j ITR_{t-j} + \dots + \sum_{u=1} \lambda_u AIG_t + U_{2t}$$

Granger equation stated Aggregate investment growth in the economy, Interest rate (ITR), Corruption Rate index (CRI), Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) index in Nigeria. Granger equation states that, current Aggregate investment growth present value is depend on its past value, present value of the independent variables Interest rate (ITR), Nigeria Poverty rate (NPR), Corruption Rate index (CRI), Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) index in Nigeria.

Sources of Data

Time series data will be utilized in this investigation to achieve empirical results on the effect of security challenges and investment potentials in Nigeria from 1980 to 2024. Data on the variables will be obtained from the Central Bank of Nigeria (CBN) statistical bulletin publications 2022, Annual Report National Bureau of statistic (NBS) 2024 and Global Terrorism Database (GTD).

Regression Results, Interpretation and Analyses

Table 2: Unit Root Test Results

Series	ADF Statistic at Level	PP Statistic at level	5% Critical Level	ADF Statistic at 1 st Difference	PP Statistic at 1 st difference	5% Critical Level	Order of Integration
AIG	-2.454790	-2.318226	-3.520787	-7.806648	-8.126165	-3.523623	I(1)
PIC	-3.789269	-1.754596	-3.523623	-7.392795	-7.016760	-3.523623	I(1)
ITR	-0.877120	-1.646095	-3.540328	-7.087353	-7.483650	-3.523623	I(1)
CRI	-6.450075	-6.862393	-3.520787	-6.518743	-41.72395	-3.544284	I(0)
ARI	-6.364650	-6.518743	-3.520787	-10.40054	-30.04011	-3.523623	I(0)
TRI	-3.496420	-3.226224	-3.520787	-6.581478	-9.983039	-3.523623	I(1)

Source: *Researcher's Estimate from Eview 9.0 (2024).*

From unit root table above, the Augmented Dickey-Fuller and Phillips-Perron (PP) test (ADF) the test result of these variables [CRI, and ARI] revealed that there exists integration of order zero I(0). Meanwhile, ADF and PP statistic values results of these variables [AIG, PIC, ITR and TRI] at first differentiation shows greater than the 5 percent critical value [3.520787] with integration of order one I(1). Again, it shows that there is already co-integration-ship among these variables but the degree of the co-integrating equation is yet unknown. Meanwhile, the existence of first order of integration I(1) and integration of order zero I(0) among the variables used in the study satisfied and justified the assumption and condition of the vector auto-regression model (VAR) estimation. The result of the unit root test show that some variables were stationary in levels while others were stationary in first order difference. This clearly shows that all the variables were not integrated of the same order. In this case, the popular Johansen co-integration method will not be applicable since the variables are not integrated in the same order. The Engle-Granger co-integration test is more suitable in cases like this.

Engle-Granger Co-integration Test

Notwithstanding that their unit test results identified integration of the different order, it became necessary for the researcher to apply Engle-Granger Co-integration as test assumption for vector auto-regression model (VAR).

Table 3: Engle-Granger Co-integration Test

Variable	Tau-statistic	Prob.*	Z-statistic	Prob.*
AIG	-3.551428	0.5034	-19.80217	0.4927
PIC	-2.907366	0.7891	-14.36251	0.7950
ITR	-3.414525	0.5682	-18.32406	0.5785
CRI	-6.974390	0.0008	-44.96617	0.0008
ARI	-6.988428	0.0007	-44.40791	0.0010
TRI	-4.128015	0.2595	-24.73660	0.2433

Source: *Researcher's Estimate from Eview 9.0 (2024).*

Judging by the Z- statistics and its corresponding probability value, there are at least six co-integrating equations in table. This means that the variables are co-integrated and it can be concluded that a long-run equilibrium relationship exists among the variables.

Analyses for Objective One: To Determine the Direction of Causality Relationship between Security Challenges and Investment Growth in Nigeria

Table 4: Granger Causality Test Results

<i>Null Hypothesis:</i>	<i>Obs</i>	<i>F-Statistic</i>	<i>Prob.</i>
AIG does not Granger Cause PCI PCI does not Granger Cause AIG	42	8.66257 0.60408	0.0008 0.5520
AIG does not Granger Cause ITR ITR does not Granger Cause AIG	42	0.17801 1.11909	0.8377 0.3377
AIG does not Granger Cause CRI CRI does not Granger Cause AIG	42	0.13009 2.03082	0.8784 0.1460
AIG does not Granger Cause ARI ARI does not Granger Cause AIG	42	0.51767 0.92562	0.6003 0.4055
AIG does not Granger Cause TRI TRI does not Granger Cause AIG	42	2.49724 1.06729	0.0965 0.3546

Source: Researchers' Extract from E-view 9.0 Estimation output (2024).

Granger causality test table above shows the direction of the causality null hypotheses, suggesting that the variable in the left side does not Granger causes the variable in the right side. Thus, we compare the computed F^x – value with reference to the Probability ratio at 5 percent level of significance for final decision. The result revealed as follows; that we should reject the null hypotheses that said; AIG does not Granger Cause PCI, CRI does not Granger Cause AIG and AIG does not Granger Cause TRI. Reason is that their computed F^x – values [8.66257AIG: PCI, (2.03082CRI: AIG and 2.49724AIG: TRI)] and their p-values; [0.0008AIG: PCI, 0.1460CRI: AIG and 0.0965AIG: TRI] were respectively significant at 5% level. In other words, the past value of aggregate

investment growth does Granger causes the present value of per capital income (PCI), the past value of Corruption Rate index (CRI) in Nigeria does Granger Cause the present value of aggregate investment growth in Nigeria, and the past value of aggregate investment growth does Granger causes the present value of Terrorism and Kidnapping (TRI) index in Nigeria. Whereas, the past value of per capital income (PCI) does not granger causes the present value of aggregate investment growth, the past value of aggregate investment growth in Nigeria does not granger causes the present value of Corruption Rate index (CRI) in Nigeria and the past value of Terrorism and Kidnapping (TRI) index in Nigeria) does not granger causes the present value of aggregate investment growth since their f- and p-value [(0.60408PCI: AIG), 0.5520p (0.13009AIG:CRI) 0.8784P and (1.06729TRI: AIG) 0.3546p] computed shows statistically insignificant which implies directional or partial causal relationship between these variables [AIG: PCI, CRI: AIG, and AIG: TRI] in the model.

Analyses for Objective two: to determine the effect of security challenges on investment growth in Nigeria Results of Error Correction Model

Table 5: Vector Auto-regression Estimates Results

	AIG	PCI	ITR	CRI	ARI	TRI
AIG(-1)	0.428112 (0.19920) [2.14918]	0.000156 (0.00015) [1.04687]	-9.36E-08 (3.2E-07) [-0.29349]	0.001784 (0.00591) [0.30177]	0.009628 (0.00575) [1.67370]	0.000116 (0.00011) [1.04032]
AIG(-2)	0.328587 (0.22913) [1.43407]	0.000270 (0.00017) [1.57516]	-2.80E-07 (3.7E-07) [-0.76422]	-0.000732 (0.00680) [-0.10773]	-0.008334 (0.00662) [-1.25949]	-8.26E-05 (0.00013) [-0.64237]
PCI(-1)	67.25901 (164.742) [0.40827]	0.888349 (0.12346) [7.19517]	-0.000625 (0.00026) [-2.37018]	2.566799 (4.88822) [0.52510]	-0.611180 (4.75759) [-0.12846]	0.081107 (0.09248) [0.87707]
PCI(-2)	-93.34130 (174.474) [-0.53499]	-0.028413 (0.13076) [-0.21729]	0.000974 (0.00028) [3.48866]	-5.502467 (5.17697) [-1.06287]	-0.478401 (5.03862) [-0.09495]	0.015716 (0.09794) [0.16047]
ITR(-1)	61911.83 (102505.) [0.60399]	44.37195 (76.8215) [0.57760]	0.559454 (0.16409) [3.40939]	1261.776 (3041.52) [0.41485]	547.0827 (2960.24) [0.18481]	32.94048 (57.5394) [0.57249]
ITR(-2)	-97068.71 (94944.0) [-1.02238]	-61.19625 (71.1550) [-0.86004]	0.083689 (0.15199) [0.55063]	-1131.780 (2817.17) [-0.40174]	182.1435 (2741.88) [0.06643]	-39.47816 (53.2952) [-0.74074]
CRI(-1)	3.361895 (7.71621) [0.43569]	8.48E-05 (0.00578) [0.01467]	-1.14E-05 (1.2E-05) [-0.92416]	-0.016718 (0.22895) [-0.07302]	0.146131 (0.22284) [0.65578]	0.002982 (0.00433) [0.68844]
CRI(-2)	11.75440 (7.82761)	-0.000116 (0.00587)	-5.79E-06 (1.3E-05)	-0.039478 (0.23226)	0.004071 (0.22605)	0.005560 (0.00439)

	[1.50166]	[-0.01972]	[-0.46188]	[-0.16997]	[0.01801]	[1.26534]
ARI(-1)	-5.952891 (7.88764) [-0.75471]	-0.000134 (0.00591) [-0.02275]	1.86E-05 (1.3E-05) [1.47421]	-0.143951 (0.23404) [-0.61507]	-0.193740 (0.22779) [-0.85053]	-0.003232 (0.00443) [-0.73007]
ARI(-2)	-0.831983 (7.85526) [-0.10591]	0.004363 (0.00589) [0.74116]	1.59E-05 (1.3E-05) [1.26346]	-0.127613 (0.23308) [-0.54750]	-0.018719 (0.22685) [-0.08252]	-0.004346 (0.00441) [-0.98560]
TRI(-1)	-356.2316 (371.357) [-0.95927]	-0.469372 (0.27831) [-1.68651]	-0.000805 (0.00059) [-1.35415]	4.885726 (11.0189) [0.44340]	22.09756 (10.7244) [2.06049]	0.675206 (0.20845) [3.23910]
TRI(-2)	478.9278 (371.432) [1.28941]	0.565086 (0.27837) [2.03001]	-0.000236 (0.00059) [-0.39691]	2.828664 (11.0211) [0.25666]	2.358841 (10.7266) [0.21991]	-0.013564 (0.20850) [-0.06506]
C	218624.9 (350479.) [0.62379]	49.57098 (262.664) [0.18872]	1.477108 (0.56105) [2.63274]	8603.154 (10399.4) [0.82727]	-3520.203 (10121.5) [-0.34780]	-34.38754 (196.736) [-0.17479]
R-squared	0.676889	0.963321	0.848147	0.121220	0.313263	0.714023
Adj. R-squared	0.538413	0.947602	0.783067	-0.255399	0.018948	0.591462
Sum sq. resids	2.03E+12	1140794.	5.204939	1.79E+09	1.69E+09	639989.5
S.E. equation	269331.1	201.8481	0.431150	7991.568	7778.005	151.1845
F-statistic	4.888122	61.28223	13.03237	0.321864	1.064378	5.825843
Log likelihood	-563.0100	-267.9666	-15.86522	-418.7903	-417.6797	-256.1170
Akaike AIC	28.09805	13.70569	1.408059	21.06294	21.00877	13.12766
Schwarz SC	28.64138	14.24901	1.951387	21.60627	21.55209	13.67099
Mean dependent	427810.1	1350.269	4.442195	6032.730	4934.122	261.3171
S.D. dependent	396423.7	881.7937	0.925690	7132.488	7852.756	236.5327
Determinant resid covariance (dof adj.)		1.34E+34				
Determinant resid covariance		1.36E+33				
Log likelihood		-1913.076				
Akaike information criterion		97.12564				
Schwarz criterion		100.3856				

Source: Researchers' Extract from E-view 9.0 Estimation output (2024).

From results above, all the coefficient variables in AIG equation lag one and two met sign expectations. The implication for lag one AIG equation is that “increase in Corruption Rate index (CRI), Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) index in Nigeria will lead to decrease in aggregate investment growth (AIG) in Nigeria by [0.0017, 0.0096, and 0.0011] respectively, while increase in per capital income (PCI) and decrease in interest rate (ITR) will lead to increase in aggregate investment growth (AIG) in Nigeria by [0.0019 and 9.3] respectively during the period of study. Whereas in lag2 AIG equation, the relationship between aggregate investment growth (AIG) in Nigeria and these variables [Corruption Rate index (CRI), Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) index in Nigeria] change to be negative which implies that decrease in Corruption Rate index (CRI), Armed Robbery index (ARI) and

Terrorism and Kidnapping (TRI) index in Nigeria will lead to increase in aggregate investment growth (AIG) in Nigeria by [0.32, 0.0027, 2.80, .0073, and 8.26] at lag2 respectively during the period of the study. Thus, the test statistics show that these variables [[2.14918] AIG₁, [1.57516] PIC₂, and ARI [1.67370]] only were significant to the study.

The vector auto-regression estimated Results for per capital income (PCI) equation met their sign (positive and negative) expectations at some lag one while some lag two. The results show that aggregate investment growth (AIG) decrease in interest rate (ITR), Corruption Rate index (CRI), and Armed Robbery index (ARI) had a negative relationship with the per capital income (PCI) in Nigeria. This implies that decrease in these variables [decrease in interest rate (ITR), Corruption Rate index (CRI), and Armed Robbery index (ARI)] will lead to increase in per capital income (PCI) while decrease in aggregate investment growth will result to decrease in per capital income (PCI) within the period of the study. Statistically, aggregate investment growth, Corruption Rate index (CRI), Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) were insignificant to per capital income (PCI) equation in the study while only interest rate (ITR) both at lag [-2.37018]one and [3.48866] two, and per capital income (PCI) itself at lag [7.19517] one were statistically significant to study.

Interest rate (ITR) equation lag one reported that the coefficients of all the variables had a positive relationship with the dependent variable. The implication is that increase in these explanatory variables [Corruption Rate index (CRI), Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) index] will lead to decrease in interest rate (ITR) by [1261.776, 547.0827, and 32.94048] respectively, while increase in per capital income (PCI) and aggregate investment growth will lead to increase in interest rate (ITR) in Nigeria during the period of the study. Whereas, per capital income (PCI) and aggregate investment growth coefficients had a negative relationship with the dependent variable while other explanatory variables remains unchanged in their signs with the explained variable. However, the implication on the changed signs in per capital income (PCI) and aggregate investment growth coefficients relationship with the explained variable is that a unit decrease in per capital income (PCI) and aggregate investment growth coefficients will lead to decrease in interest rate (ITR) in Nigeria by [68 and 61] percent, while CRI, ARI and TRI will lead to a decrease in interest rate (ITR) in Nigeria by [1131, 182, and 39] percent at lag two respectively. Statistically, none of these variables were significant to this study.

The coefficients variables in Corruption Rate index (CRI) equation in the table above reported that interest rate (ITR), Corruption Rate index (CRI) itself at lag one and per capital income (PCI) at lag two had a negative relationship with the dependent variable, while aggregate investment growth, Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) index had a positive relationship with the dependent variable. The implication is that decrease in interest rate (ITR), Corruption Rate index (CRI) itself at lag

one and per capital income (PCI) at lag two will lead to increase to Corruption Rate index (CRI) in Nigeria. Whereas, increase in aggregate investment growth, Armed Robbery index (ARI) and Terrorism and Kidnapping (TRI) increase Corruption Rate index (CRI) in Nigeria. The variables all had their right expected signs. Statistically, only aggregate investment growth is significant to the study.

Looking at the Armed Robbery Index (ARI) vector autoregression equation, we observed that the coefficients variables in the equation in the table 4.4 above reported that all the explanatory variables had negative relationship with dependent variable both at lag one and two except interest rate (ITR) that had positive relationship with the dependent variable. This implies that decrease in all the variable will lead to decrease in Armed Robbery index (ARI) in Nigeria while, increase in interest rate (ITR) will lead to increase in Armed Robbery index (ARI) in Nigeria by [5.9, 0.01, 1.86, 0.14, 0.19, and 0.03] at lag one whereas, [0.83, 0.04, 1.59, 0.12, 0.018, 0.04] at lag two respectively. Statistically, none of the variables were significant to the study. Vector autoregression equation of Terrorism and Kidnapping (TRI) index in Nigeria show that these variables [AIG, PIC and ITR] had negation relationship with the depended variable while (CRI, ARI and TRI) had appositive relationship with the Terrorism and Kidnapping (TRI) index in Nigeria at lag one equation. The implication is that decrease in these variables [AIG, PIC and ITR] will lead to increase in Terrorism and Kidnapping (TRI) index in Nigeria while increase in (CRI, ARI and TRI) variables will lead to decrease in Terrorism and Kidnapping (TRI) index in Nigeria by [356.23, 0.469, 0.005, 4.885, 22.097 and 0.675] percent respectively in the study.

Whereas, in the lag, these variables [ITR and TRI] had negation relationship with the depended variable while (CRI, ARI AIG and PIC) had positive relationship with the Terrorism and Kidnapping (TRI) index in Nigeria at lag two. Statistically, only per capital income (PCI) and Armed Robbery index (ARI) were significant to the study.

The constant coefficients of the vector autoregression estimated Results show that at each system equation of the variables, their constant values of AIG, PCI, ITR, and CRI ere positive to the study, while the constant values of variable ARI and TRI were negative. The implication is that holding other explanatory variables constant, variables at their equation standing as dependent variable will stand at [24.9, 49.57, 1.47, 03.15, 20.20 and 34.38] percent respectively in the study. The coefficient of adjusted determination (R^2) is 0.538413. This shows that about 53% of the systematic variation in AIG is explained by the group of explanatory variables. The F-Statistics has a coefficient of 4.888122 with a probability value of 0.0000. This shows that the group of explanatory variables is significant determinants of the dependent variable. Given the value of the coefficient of determination and F-Statistics, the model has a good fit.

Evaluation of Working Hypotheses

Null Hypothesis I: There is no causality relationship between security challenges and investment potential growth in Nigeria.

We employed Granger Causality Test table results to examine the hypothesis one of the study by comparing the computed F^x – value with reference to the Probability ratio at 5 percent level of significance for final decision. First, we reject the null hypothesis one of this study and accept the alternative hypothesis with the following observations:

- The computed F^x – values of these variables [8.66257AIG: PCI, (2.03082CRI: AIG and 2.49724AIG: TRI)] and their p-values; [0.0008AIG: PCI, 0.1460CRI: AIG and 0.0965AIG: TRI] were respectively significant at 5% level. In other words, the past value of aggregate investment growth does Granger causes the present value of per capital income (PCI), the past value of Corruption Rate index (CRI) in Nigeria does Granger Cause the present value of aggregate investment growth in Nigeria, and the past value of aggregate investment growth does Granger causes the present value of Terrorism and Kidnapping (TRI) index in Nigeria.
- There exist directional or partial causal relationship between these variables [AIG: PCI, CRI: AIG, and AIG: TRI] in the model in Nigeria during the periods of the study. Based on this, we concluded, “There is causality relationship between security challenges and investment potential growth in Nigeria” during the period of the study 1980- 2024.

Null Hypothesis 2: Security challenges have insignificant effect on the investment growth potential in Nigeria.

We examine the hypothesis two of the study by considering the size and signs of the coefficients used in the model and as well their significance as we compare the t-statistic both calculated and tabulated critical value at 5% level of significance from VAR table. Thus, with the following observations; T-test: show that these variables [[2.14918] AIG₁, [1.57516] PIC₂, ARI [1.67370], Interest rate (ITR) both at lag [-2.37018]one and [3.48866] two, and per capital income (PCI) itself at lag [7.19517] one employed in the model were statistically significant at 5% level of significance. In other words, from the regression estimate were respectively greater than the tabulated t- value is 1.569. Based on this, we therefore reject the null hypothesis one of this study and accept the alternative hypothesis one that said, “Security challenges have significant effect on the investment potential growth in Nigeria” during the period of the study 1980-2024.

4. Conclusion

We analyzed the state of security and investment in Nigeria based on the following objectives to; the direction of causality relationship between security challenges and investment potential growth in Nigeria determine the effect of security challenges on investment potential growth in Nigeria from 1980 to 2024. Consequently, based on the results obtained and interpreted in this paper, the null hypotheses one and two were rejected. This implies that stated, “There exist directional or partial causal relationship

between security challenges and investment potential growth in Nigeria and that security challenges have significant effect on the investment potential growth in Nigeria.” Thus, given the prevailing policy environment in Nigeria, these explanatory variables, has significantly impacted and did decline the investment growth potential of the Nigerian economy. We conclude that level of insecurity in Nigeria is high which significant affected negatively on the aggregate investment potential growth in Nigerian economy. This paper recommends that “Nigeria governments with its unlimited public funds, should fund security programs preferably, adopt security literacy as a national strategy for security inclusion. From the result, there is directional or partial causal relationship between these variables [AIG: PCI, CRI: AIG, and AIG: TRI], the paper then recommends that government should drive and upgrade more modern security infrastructural internet facilities and other related service providers which has its availability and affordability is sure for the security services in Nigeria.

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