



Growth and Fiscal Effects of Insecurity on the Nigerian Economy

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Abstract

In spite of government counter-terrorism expenditure and efforts, the prevalence of insecurity in Nigeria appears to be rising and fast evolving into an existential crisis that is shaking the foundation of its nationhood. The current study used annual time-series data from 1980 to 2019 and the ARDL methodology to analyse the fiscal and socio-economic consequences of insecurity on economic growth in Nigeria. The empirical findings demonstrated that high unemployment rate, domestic capital formation, foreign direct investment, government spending on education and security are negatively affected by the growing level of insecurity and consequently retarded growth in the long and short run. Conversely, improved health services, equitable income distribution and productive use of public borrowing were positively correlated with security and, therefore, stimulated growth in the long and short run. Government revenue and inflation rate accelerated growth in the long run whereas their short-run effect was deleterious. The findings suggest that good governance, provision of a safe and secured environment for human capital development and businesses, improved access to social and economic services will curb violent tendencies, create jobs, reduce poverty, increase government revenue and engender long-term inclusive growth.

Keywords Bound test to co-integration · Bad governance · Economic growth · Enablers of insecurity · Terrorism Index · Nigeria · Security spending · Unit root

JEL Classification C32 · E31 · H56 · O40

Résumé

Malgré les dépenses et les efforts du gouvernement en matière de lutte contre le terrorisme, la prévalence de l'insécurité au Nigéria semble augmenter et évoluer rapi-

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dement vers une crise existentielle qui ébranle les fondements même de son identité nationale. Cette étude a utilisé des données de séries chronologiques annuelles de 1980 à 2019 et a analysé, à l'aide de la méthode ARDL, les conséquences fiscales et socio-économiques de l'insécurité sur la croissance économique au Nigeria. Les résultats empiriques ont démontré que le niveau croissant d'insécurité a un impact négatif sur le taux de chômage, qui est élevé, sur la formation de capital intérieur, l'investissement direct étranger, les dépenses publiques en matière d'éducation et de sécurité. Par conséquent, cela ralentit la croissance à long et à court terme. À l'inverse, l'amélioration des services de santé, la répartition équitable des revenus et l'utilisation productive des emprunts publics étaient des facteurs positivement corrélés à la sécurité et qui ont ainsi stimulé la croissance à long et à court terme. Les recettes publiques et le taux d'inflation ont accéléré la croissance à long terme alors que leur effet à court terme était délétère. Les résultats suggèrent qu'une bonne gouvernance, l'existence d'un environnement sûr et sécurisé pour le développement du capital humain et des entreprises, un meilleur accès aux services sociaux et économiques pourront freiner les tendances violentes, créer des emplois, réduire la pauvreté, augmenter les recettes publiques et engendrer une croissance inclusive à long terme.

Introduction

The protection of people and property from local and international dangers is critical for the functioning of markets and the incentives to invest and innovate. This may explain why many countries around the world wish and work to maintain peace and security within and beyond their borders (Amana et al. 2020). Good governance entails ensuring justice, empowerment, employment and efficient service delivery. So, governments should continue to work toward eradicating poverty, narrowing income and wealth disparities, eliminating corruption and nurturing good governance policies (Mazumdar and Bhattacharjee 2019). On the other hand, rising levels of insecurity and anti-national activities pose a significant challenge to national rules and regulations, human rights and, in particular, have a significant negative impact on the economy, affecting price, output, employment, trade balance, poverty, inequality, defence expenditure, government budget patterns, socio-political environment and several others (Isola et al. 2019).

It has been widely argued that insecurity and violent extremism can have a negative impact on economic growth in the short run through a variety of channels. Terrorism reduces the capital stock of a country by destroying human and physical capital. To combat terrorism, increased government spending on security may crowd out more growth-enhancing public and private investments in social sectors such as health and education, affecting a country's long-term growth (Micheal et al. 2019). The risk and uncertainty effect associated with rising level of insecurity causes Foreign Direct Investments (FDI) to be redirected away from countries with higher security risk and toward countries with lower risk. Increased levels of insecurity reduce investment returns, reducing a developing country's capacity to attract



foreign direct and portfolio investments (Chuku et al. 2019). Furthermore, terrorist activities create economic risks and uncertainties that distort the equilibrium resource allocation within a country by influencing individuals' savings, investment and consumption behaviour. Terrorist activity also stifles growth by increasing the cost of doing business through higher wages, higher insurance premiums and increased security expenditures. These higher costs result in lower profits and, as a result, a lower return on investment. Terrorist attacks can also devastate infrastructure, causing business disruptions (Brodeur 2018). However, the intensity of the consequences of terrorist events on the economy may be varied across countries based on the economic structure.

Nigeria has been ravaged by terrorist activities which has made the country unsafe for Nigerians and foreign investors. The country was named the third most afflicted by terrorism in the 2020 Global Terrorism Index, trailing only Iraq and Afghanistan (GTI, 2021). The disturbing level of insecurity has rendered the economy unappealing to local and foreign investors, who have become apprehensive of investing and putting their hard-earned resources in profitable investment in Nigeria (Chuku et al 2019). In addition to the country's deteriorating security situation, Nigeria is beset with significant developmental issues that constitute a severe threat to socio-economic progress. These socio-economic issues include widespread poverty in the midst of plenty, sharp inequality in income distribution, extreme youth unemployment, poor industrial output, high inflation rate, decrepit infrastructure and fragile GDP growth (Edeme and Nkaku 2019). These and other depressing macroeconomic statistics, compounded by the COVID-19 pandemic, are an effective prescription for conflict and violence as the struggle for survival over limited resources intensifies.

Nigeria's myriad of security concerns is becoming rather too complex for the country's armed forces to manage, and overcoming them would require a comprehensive response. Insurgency, banditry, organized kidnapping and other forms of criminality have created a thriving trade in small arms, light weapons and other illicit trafficking. The proliferation of weaponry has increased insecurity in the country, resulting in over 80,000 deaths and 3 million Internally Displaced Persons (IDPs) despite the fact that the country is not at war (United Nations refugee agency and the Council on Foreign Relations 2021). The number of small arms and light weapons in the hands of non-state actors and civilians in Nigeria is estimated to be around 6,145,000, compared to 586,600 firearms in the hands of the armed forces and law enforcement agencies (The Institute for Security Studies 2021). Security forces have been overwhelmed, allowing terror groups to operate with little or no resistance, primarily in huge swaths of ungoverned spaces. Local disputes are used by violent extremist organizations, who take advantage of insufficient governmental security and protection to establish their own influence over local communities and safeguard their groups' survival. In the absence of government security, community members may be forced to assume control of their own security. This would result in increased violence, the loss of lives and livelihoods and the proliferation of weapons.

Despite government counter-terrorism expenditure and efforts in recent years, the level of insecurity in Nigeria has continued to deteriorate while the terrorists and bandits are seemingly more emboldened and audacious. Why has the government



effort at stemming the tide of insecurity in Nigeria yielded little results despite increased security spending? To understand this, one must ask whether government attempt at resolving the problem of insecurity in Nigeria is directed at the root causes, or the symptoms of insecurity or both. It argued that unless the root causes of insecurity in Nigeria are effectively addressed while attacking the symptoms of insecurity, the government may not succeed much in addressing the myriad of security challenges in the country. This study relies on documented evidences to interrogate these questions and proffer necessary policy recommendations premised on the findings.

Economic theory distinguishes between the determinants of short- and long-term growth. In the short run, growth is affected by shocks that cause the economy to temporarily deviate from its long-run growth trajectory, because sources of friction, such as sticky wages and prices, prevent the economy from adjusting instantaneously. By contrast, long-run economic growth is typically driven by productivity improvements, capital accumulation, employment growth, macroeconomic trends, technological innovation and structural transformation. Consequently, econometric models must distinguish between different time horizons or else risk arriving at flawed conclusions regarding economic relationships, which may translate into poor policy decisions (Usman and Olivier 2021). Because the effect of insecurity on economic growth may vary according to the time horizon, the short-run relationship between the two variables may differ from the long-run relationship.

Until recently, studies on the drivers of insecurity in Nigeria were mostly conceptual and under-researched. This dearth of thorough quantitative empirical research may be credited as the primary source of insufficient policy direction in Nigeria on how to holistically address varying degrees of insecurity and criminality. Given the importance of time horizons in econometric modelling, the current study fills a vacuum by systematically assessing the long and short-term fiscal and socio-economic effects of insecurity on economic growth in Nigeria using annual time-series data from 1980 to 2019. The stochastic properties of the variables are looked into by carrying out the conventional Augmented Dicky-Fuller (ADF), Phillips-Peron (PP) and the Zivot and Andrews structural break unit root test followed by the Pesaran et al. (2001) Auto-Regressive-Distributed Lag (ARDL) approach for testing the existence of co-integration relationship among the study variables. Aside from the scholarly benefit this study portends for counter-terrorism and related issues; it is also expected to be a significant contribution to Nigeria's effort in resolving various security challenges. In addition to the military-driven strategy being undertaken at the moment, the study argued that inclusive growth and good governance is more certain to scale down insurgency and suggest a holistic solution that will also address other identified factors responsible for societal failures that lead to the creation of ready-made manpower for the various violent sects in Nigeria.

Nigeria's situation is remarkable because of the country's consistent increase in instability over the last few decades, as well as the country's status as a regional power. Nigeria, one of Africa's largest economies, is also the security lynch pin of Sub-Saharan Africa. Escalation of insecurity in Nigeria could have serious implications on the region stability and create displacement spill over that could affect the demography and security situation of neighbouring countries and on global peace.



The rest of the study is structured as follows: section two presents the conceptual and theoretical framework. Section three focuses on the methodological issues and procedures that guided the study. Section four addresses the findings and interpretation of the results followed by section five which concludes the study and provides policy recommendations.

Conceptual and Theoretical Framework

Conceptualizing Security

Security is literally defined by most of the mainstream writings as a state's capabilities to protect life and properties, as well as, defend its territorial integrity from either actual or imagined threats through the country's security apparatuses. The sovereignty of a nation state may be determined by their capacity to safeguard citizens and her resources against any attack, be it from within or outside the state territory (Nkwatoh and Nathaniel 2018). It is natural for people to be hostile in reacting to an issue or series of issues that upset/ threaten their normal way of living. Therefore, security is the ability of state security mechanisms, which involve state and non-state actors, to prevent and/or manage anxiety, uncertainty and harm that has the capacity to distort serenity and development.

Internationally, several attempts are well documented in existing security literature to widen the contextualization of security to accommodate other relevant actors/ stakeholders. This is critical because security issues go beyond the state's capabilities to defend its territorial integrity from external aggression and internal insurrection. Human development issues such as socio-economic development, availability of hygienic food, good health condition, conducive environment that will improve the general well-being of people now form the idea of security (Ewetan and Urhie 2014). Purity and Anigbuogu (2019) divided the theoretical literature's different viewpoints on human security into two basic group. The neo-realist school of thought on one hand, considers security as the pursuit of freedom from threat and the ability of states and societies to maintain their independent identity and their functional integrity against forces of change which they consider as hostile. This conceptualization of security is traditional and built on the realist philosophy which views security as the primary obligation of the state.

The liberal or democratic viewpoint on the other hand, perceives security to reasonably include a substantial range of concerns about the conditions of existence. These conditions are more than mere survival but also to promote the ability of a referent object, in the case of humans, to go about their activities easily and without fear and anxiety of reaching their highest possible potentials. This form of security comes with a sense of awareness of the measures that create an enabling environment for safety, minimizes vulnerabilities in any form and aspect of human well-being and guarantees protection in the face of threatening situations (Micheal et al. 2019). The liberal school of thought believes that the government should focus on improving individual economic prosperity over crime prevention because economic uncertainty is the root cause of insecurity. According to the intelligence community,



security is not the absence of potential risks or vulnerabilities, but rather the accessibility of a comprehensive approach capable of responding accurately to the issues raised by these attacks with speed, competence and in a timely manner (Ikechukwu 2019).

There is a broad agreement in published studies that security is critical for national stability, peace and long-term economic growth. The failure of most developing nations' economic growth to produce associated common benefits and contribute to solving issues such as unemployment, deprivation, inequality, starvation, low literacy rates and increasing violent acts and armed conflicts prompted the innovative thoughts at redefining growth from a productivity expansion to an all-inclusive outlook of sustainable growth (Mazumdar and Bhattacharjee 2019). Consequently, this study conceptually defined insecurity as a collapse in growth and prosperity caused by historical, religious, ethno-regional, civic, social, economic, or political factors that contributes to recurring conflicts and results in systematic destruction of lives and property.

Theoretical Framework

Though several research has examined the fiscal and socio-economic effects of insecurity on growth using various theoretical approaches, the theoretical foundation of this study is anchored on the relative deprivation theory discussed below:

According to Gurr's (1970) **relative deprivation theory**, insecurity stems from a collective discontent induced by a sense of economic and social deprivation. Three ideas, each concentrating on a different component of deprivation, lend support to the concept that deprivation is likely to lead to violence. First, there is the notion of frustration and aggression, which states that frustration generates aggressive behaviour (Hogg 2016). Second, there is the expectation theory, which holds that failure to achieve an expected outcome will result in violence (Özdamar 2008). Third, the reactance thesis proposes that the removal of behavioural freedom, which causes the arousal of reactance, may lead to violence (Baumeister et al. 2002). These three ideas emphasize the fact that different types of insecurity in Nigeria may be the result of varying levels of impoverishment.

Many developing countries, like Nigeria, have unusually poor material conditions, as well as problems with governance and the economy. The political process is plagued with inept, corrupt administrations and bad leadership. Poverty, inflation, unemployment, access to education and to social services and decrepit services and infrastructures continue (Evans and Kelikume 2019). Similarly, it is certain that significant socio-economic inequalities could generate conflict especially when the economic growth prospects are negative. The pervasive hardship and permissive settings for violence cause widespread disillusionment, outrage and public mistrust, which manifests as the people resist and undermine society's principles. As a result, there will be a significant number of furious people who are vulnerable to various political, cultural and other manipulations that can easily turn their rage and frustration into violence.



Recent evidences show that terrorism is becoming frequent in Nigeria, ranging from incessant Boko Haram and its offshoot, the Islamic State of West Africa Province (ISWAP) insurgency in the North East; Independent People of Biafra (IPOB) activities in the South-East states, kidnapping and vandalization of oil pipes in the South-South, nomadic cattle herders and farmers clashes in the Middle Belt, banditry and a thriving mass abduction-for-ransom business in the North-West and North-central states among others. Existing studies have suggested that violence in Nigeria may be considered as a consequence of economic and political factors such as poverty, unemployment, inequality, corruption and poor governance. The predominance of socio-economic insecurity might make survival a vital concern (Purity and Anigbuogu, 2019). The more challenging problem, however, is that the motivation for terrorism in a resource-rich, socially heterogeneous developing country like Nigeria could be confounded by additional dimensions, such as resource competition, ethnic fractionalization and economic deprivation; all of which interact to make the situation more intricate to understand or deal with, especially because of the relatively lower capacity of a typical developing economy to confront the increasing sophistication of terrorist activities. Hence, the consequences of terrorism in such an environment are likely to extend beyond the destruction of lives and property to longer term macroeconomic impacts (Isola et al. 2019).

Empirical Review

The literature on the terrorism–macro-economy relationship has largely been motivated by the seminal paper by Blomberg et al. (2004), who conducted an empirical investigation of the macroeconomic consequences of international terrorism and its interactions with alternative forms of collective violence. Their findings indicate that, on average, the occurrence of terrorism may have a significant negative impact on economic growth. They also discover that terrorism is associated with a shift in economic activity away from investment spending and toward government spending, with varying degrees of occurrence across different groups of countries. Similarly, Gassebner and Luechinger (2011) used extreme bounds testing to evaluate more than seventy previous terrorism studies and discovered that economic activity had a robust and negative relationship with terrorism. In the case of Pakistan, Mehmood (2014) calculates the cumulative cost of terrorism to the Pakistani economy between 1973 and 2008 to be 33.02%.

Theoretical models explaining the channels through which terrorism impedes economic growth are presented by Collier (1999), Eckstein and Tsiddon (2004), Gaïbulloev and Sandler (2008). These channels can be divided into two types: direct and indirect costs. Collier (1999) identifies the most obvious and direct peril of civil war (of which terrorism can be considered a subset) as the destruction of physical capital, including the destruction of public infrastructure and the loss of human capital. As the effectiveness of government institutions is jeopardized, this destruction leads to a simultaneous increase in transaction costs as a result of reduced security. Another important factor is the proportion of GDP allocated to investment spending. Terrorism causes economic activity to diverge from investment spending to



government spending on terrorism, primarily for the installation of non-productive defence mechanisms against terrorist activities, according to Gaibulloev and Sandler (2008). Furthermore, Eckstein and Tsiddon (2004) argue that terrorism raises the perceived likelihood of an untimely death, prompting people to substitute future savings for current consumption in order to maximize utility in the present at the expense of the future, which is another cause of decline in economic activity.

Chuku et al., (2019) adopted the ARDL and Structural Vector Auto-regressive (SVAR) technique to examine the growth and fiscal consequences of terrorism in Nigeria using different measures of terror incidence, government expenditure and economic activity. The empirical results indicated that terrorism leads to the reallocation of economic activity away from private investment spending to government counter-terrorism spending thereby impacting negatively on growth. The study omitted the revenue side of fiscal policy and proxy growth using the inflation-unadjusted GDP. There exist some gaps in the reviewed studies, despite the fact that they cover a large body of literature. The literature has not taken into account the possibility that the economic costs of terrorism may be determined by the extent of resource dependence and the nature of the political regime in place. The focus on a developing country, such as Nigeria, aids in understanding whether growth is sustainable under the conditions that developing countries face, particularly in terms of the weak institutional and military capabilities to protect their citizens and assets from acts of terrorism, which could have severe repercussions for the development process. (Blomberg et al. 2011). Furthermore, most of the existing empirical studies are panel based and are unable to uncover country-specific idiosyncrasies in the economy–terrorism relationship, particularly for a resource-rich developing country. This study attempts to fill these identified gaps by interpreting the country-specific characteristics of the economy-terrorism relationship in Nigeria, a resource-rich country.

Data and Methodology

There are various channels through which insecurity can have growth and fiscal effects on the economy. By disrupting private and public investments, violent conflicts can reduce the generation of government revenue which can alter government expenditure. In addition to their effects on real activities, prolonged armed conflict can destroy part of the tax base and weaken the efficiency of tax administration (Gupta et al. 2004). Typically, increased defence spending can affect the composition and pattern of public expenditure by lowering the expenses on productive and growth-enhancing sectors of the economy such as education and health (Edeme and Nkaku 2019). Apart from the destruction of physical infrastructure and human capital, violent conflicts have a lagged effect on investment, which ultimately reduces the fiscal position of a country. These fiscal imbalances may have ripple effects on economic growth. The ex post facto and quantitative research designs were used in this study to provide empirical answers to the research problems using already available data.



The study draws on data from various sources namely, Global Terrorism Database (GTD) and World Development Indicators (WDI; World Bank), Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS) database using the desk survey approach. The macroeconomic variables on which data were collected included the Real Gross Domestic Product (RGDP), Foreign Direct Investment inflow as a percentage of GDP (FDI), Federal Government Retained Revenue (FRR), Government Expenditure on Education (GEE), Gross Fixed Capital Formation as a percentage of GDP (GFCF), Government Expenditure on Health (GHE), Government Security Spending (GSS), Government Total Debt as a percentage of GDP (GTD), Inflation Rate (INFR), Level of Insecurity (INS), Per Capita Income (PCI) and Unemployment Rate (UMP). The study used annual Nigeria time-series data spanning 40 years, with the sample period covering 1980 to 2019. Data on RGDP, FRR, GEE, GHE, GSS and PCI which were taken in monetary terms were log transformed to stabilize the variance of the series while others retained their percentage form. Eviews 12 statistical package was utilized for data analysis.

The dependent and independent variables utilized in this analysis were chosen after considering fundamental economic theories, relevant empirical literature and the study's objectives. The exclusion of relevant variables in a regression model has been demonstrated in econometric studies to cause bias, the size of which relies on the interaction between the omitted variable, the other explanatory factors and the dependent variable (Gujarati and Porter 2009). To avoid variable omission bias, the study modelled RGDP as a function of the aforementioned potential drivers of insecurity using a broad formulation of Romer (1986) and Lucas' (1988) endogenous growth model. The multivariate model adopted in this study emphasizes the short and long-term fiscal and socio-economic effects of insecurity on economic growth of Nigeria. The researcher, therefore, devised and specified an Auto-regressive-Distributed Lag (ARDL) model, in an Error Correction Model (ECM) form as follows:

$$\begin{aligned}
 \Delta \text{LnRGDP}_t = & \beta_0 + \beta_1 \text{LnRGDP}_{t-1} + \beta_2 \text{FDI}_{t-1} + \beta_3 \text{GFCF}_{t-1} + \beta_4 \text{GTD}_{t-1} \\
 & + \beta_5 \text{INFR}_{t-1} + \beta_6 \text{INS}_{t-1} + \beta_7 \text{LnFRR}_{t-1} + \beta_8 \text{LnGEE}_{t-1} \\
 & + \beta_9 \text{LnGHE}_{t-1} + \beta_{10} \text{LnGSS}_{t-1} + \beta_{11} \text{LnPCI}_{t-1} + \beta_{12} \text{UMP}_{t-1} \\
 & + \sum_{i=0}^q \theta_1 \Delta \text{LnRGDP}_{t-i} + \sum_{i=0}^q \theta_2 \Delta \text{FDI}_{t-i} \\
 & + \sum_{i=0}^q \theta_3 \Delta \text{GFCF}_{t-i} + \sum_{i=0}^q \theta_4 \Delta \text{GTD}_{t-i} \\
 & + \sum_{i=0}^q \theta_5 \Delta \text{INFR}_{t-i} + \sum_{i=0}^q \theta_6 \Delta \text{INS}_{t-i} + \sum_{i=0}^q \theta_7 \Delta \text{LnFRR}_{t-i} \\
 & + \sum_{i=0}^q \theta_8 \Delta \text{LnGEE}_{t-i} + \sum_{i=0}^q \theta_9 \Delta \text{LnGHE}_{t-i} \\
 & + \sum_{i=0}^q \theta_{10} \Delta \text{LnGSS}_{t-i} + \sum_{i=0}^q \theta_{11} \Delta \text{LnPCI}_{t-i} \\
 & + \sum_{i=0}^q \theta_{12} \Delta \text{UMP}_{t-i} + \text{ECT}t - 1 + \mu t
 \end{aligned} \tag{1}$$



where all variables remain as earlier defined. Δ denotes the first differences of the respective variables and i is the lag length corresponding to each variable. t = time trend consisting of years from 1980 to 2019. β_0 = Intercept.

$\beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}$ and β_{12} are the coefficients of the long-run impact of the explanatory variables to be estimated. $\emptyset_1, \emptyset_2, \emptyset_3, \emptyset_4, \emptyset_5, \emptyset_6, \emptyset_7, \emptyset_8, \emptyset_9, \emptyset_{10}, \emptyset_{11}$ and \emptyset_{12} are the coefficients of the short-run impact related to the model's convergence to long-run equilibrium, whereas ECT is the speed of adjustment parameter that transmits the pace of convergence or how quickly the variables returned from disequilibrium in the short-run to long-run equilibrium. In the event of a disturbance, it reveals how quickly the system returns to equilibrium.

The proxies for the variables employed in the empirical model of this study are in accord with studies such as Apanisile and Okunlola (2014), Evans and Kelikume (2019), Edeme and Nkalu (2019), Laniran and Ajala (2021). It is expected that these variables are correlated with one or more of the endogenous variables in the model.

Estimation Procedure

The study adopted the Auto-Regressive-Distributed Lag (ARDL) approach for testing the existence of co-integration relationship among the variables as developed by Pesaran et al. (2001). This methodology is recommended over traditional co-integration approaches (Engle and Granger, 1987; Johansen 1988, 1991; Johansen and Juselius 1990), which necessitate a long sample time and all variables to be I(1). Firstly, endogeneity problems and inability to test hypotheses on the estimated coefficients in the long run associated with the Engle-Granger (1987) method are avoided. Secondly, the model's long- and short-run parameters can be estimated concurrently, as can the speed of adjustment to long-run equilibrium caused by any short-run external shocks, thereby removing the issues associated with omitted variables and the occurrence of autocorrelation. Thirdly, the econometric methodology is relieved of the responsibility of determining the order of integration among variables and pre-testing for unit roots. Because the variables are assumed to be stationary at levels (I(0)), first difference (I(1)) or fractionally integrated, pre-testing for unit roots in time-series variables and determining first-order integration or I(1) behaviour are not necessary for this technique (Ewetan et al 2020). However, to assure the relevance of the co-integrating relationship, Pesaran et al. (2001) stated that the dependent variable should be first difference stationary. Rahman and Islam (2020) also believe that the presence of any I(2) variable(s) may cause the system to crash. As a result, it is preferable to perform some efficient unit root tests to check that no I(2) variable(s) is/are included in the model. Furthermore, while the results from the estimation process derived from the Engle and Granger and Johansen and Juselius methods are not efficient and consistent for studies with small sample size, Pesaran et al., (2001) indicated that the short and long-run parameters estimated using the ARDL methodology are reliable and efficient for small sample analyses that can be compared to what we have in this study. According to Nguyen (2020), the ARDL bounds testing methodology has considerably superior small sample



Table 1 Descriptive statistics of variables

	Mean	Median	Maxi	Mini	Std. Dev	Skewness	Kurtosis	J.B Prob	Obs
RGDP	34,793,346	23,068,845	84,064,360	13,779,256	21,372,676	0.84	2.32	0.065	40
FDI	1.49	1.13	5.79	1.15	1.29	1.40	5.72	0.00	40
FRR	144,726	6045.55	3,344,560	597.30	536,729	5.52	33.25	0.00	40
GEE	120.23	41.75	593.33	0.16	161.87	1.29	3.49	0.003	40
GFCF	37.18	35.32	89.39	14.17	20.66	0.99	3.39	0.03	40
GHE	71.75	15.93	388.37	0.04	102.50	1.42	3.99	0.005	40
GSS	142,333	41,445	668,732	810	193,601	1.32	3.60	0.02	40
GTD	33.89	26.36	79.38	7.26	22.04	0.66	2.17	0.13	40
INFR	18.92	12.39	72.84	5.39	16.91	1.82	5.15	0.00	40
INS	0.35	0.00	1.00	0.00	0.48	0.63	1.39	0.03	40
PCI	1297.76	892.37	3098.99	270.22	869.19	0.54	1.85	0.12	40
UMP	9.67	6.26	27.10	1.80	7.16	0.83	2.66	0.09	40

qualities than multivariate co-integration. Likewise, in contrast to vector autoregressive (VAR) models, the ARDL model can accommodate a greater number of variables and is more versatile in terms of lag structure because it can accept multiple optimal lag structures for distinct variables Micheal et al., (2019).

Results and Discussions

Preliminary Analysis of Study Variables

The study conducted series of preliminary tests on the nominal data set utilized in the research by characterizing the major properties of the study variables to assess their reliability and suitability for running OLS regression. A summary of descriptive statistics for each study variable is provided in Table 1.

From Table 1, the Jarque–Bera probability values of RGDP, GTD, PCI and UMP are greater than the 5% significance level indicating that these variables are normally distributed. The Jarque–Bera probability values of the other variables demonstrated a distinct lack of normality in their residuals, as evidenced by the significant Jarque–Bera probability values of less than 0.05. The non-normality of residuals could be attributable to the fact that these variables are particularly susceptible to oil price shocks and other economic instability, which may have caused outliers, resulting in residual non-normality. The Jarque–Bera probability of the log-transformed values of FRR, GEE, GHE, GSS and PCI were, however, estimated to be normally distributed. Furthermore, normality of data distribution is not required to apply the ARDL co-integration method used in this study (Rahman and Islam 2020). Consequently, the estimated results reported in the study are deemed to be quite efficient.



Table 2 The Pearson correlation analysis

	FDI	FRR	GEE	GFCF	GHE	GSS	GTD	INFR	INS	PCI	UMP
FDI	1.00										
FRR	-0.28	1.00									
GEE	0.31	-0.40	1.00								
GFCF	-0.34	0.49	-0.76	1.00							
GHE	0.30	-0.41	0.78	-0.74	1.00						
GSS	0.26	-0.41	0.77	0.73	0.77	1.00					
GTD	-0.09	0.50	-0.38	0.45	-0.38	-0.44	1.00				
INFR	0.19	0.12	-0.18	0.12	-0.15	-0.13	0.18	1.00			
INS	-0.28	-0.17	0.47	-0.44	0.49	0.55	-0.49	-0.15	1.00		
PCI	-0.19	-0.52	0.59	-0.60	0.59	0.61	-0.72	-0.33	0.75	1.00	
UMP	0.35	-0.61	0.79	-0.75	0.79	0.77	-0.32	-0.19	0.30	0.57	1.00

Table 3 Summary of unit root test

Variables	ADF		PP Test			Zivot-Andrews			
	Level	1st Diff	Level	1 st Diff	Remark	Break Date	Level	1 st Diff	Rmk
LnRGDP	0.9833 ⁿ	-4.030 ^a	1.578 ^N	-3.927	I(1)	2017 ^a	-2.734 ⁿ	-4.839 ^a	I(1)
FDI	-4.188 ^a	-5.494 ^a	-4.135 ^a	-13.89 ^a	I(0)	1994 ^a	-5.160 ^a	-10.134 ^a	I(0)
GFCF	-4.554 ^a	-4.554 ^a	-3.292 ^b	-4.639 ^a	I(0)	2013 ^a	-	-5.020 ^a	I(0)
							4.736 ^b		
GTD	-2.029 ⁿ	-4.376	-1.952 ⁿ	-4.376 ^a	I(1)	1998 ^a	-5.458	-5.668 ^a	I(0)
INFR	-2.442 ⁿ	-6.272 ^a	-2.870 ^c	-11.88 ^a	I(1)	1995 ^a	-5.587 ^a	-7.385 ^a	I(0)
INS	-1.506 ⁿ	-6.000 ^a	-1.571 ⁿ	-6.000 ^a	I(1)	2007 ^b	-4.473 ^b	-6.249 ^a	I(0)
LnFRR	-1.764 ⁿ	-4.765 ^a	-1.803 ⁿ	-4.765 ^a	I(1)	2018 ^a	-2.844 ⁿ	-6.571 ^a	I(1)
LnGEE	-1.903 ⁿ	-5.216 ^a	-1.091 ⁿ	-11.221 ^a	I(1)	2008 ^b	-5.939 ^a	-5.646 ^a	I(0)
LnGHE	-2.941 ⁿ	-6.342 ^a	-0.769 ⁿ	-19.688 ^a	I(1)	2002 ^a	-3.643 ⁿ	-5.891 ^a	I(1)
LnGSS	-0.143 ⁿ	-6.429 ^a	-0.041 ⁿ	-6.442 ^a	I(1)	1993 ^b	-3.368 ⁿ	-7.134 ^a	I(1)
LnPCI	-0.739 ⁿ	-6.610 ^a	-0.739 ⁿ	-6.373 ^a	I(1)	1993 ^a	-3.578 ⁿ	-9.883 ^a	I(1)
UMP	-0.383 ⁿ	-5.137 ^a	-0.383 ⁿ	-5.129	I(1)	2016 ^b	-3.822 ⁿ	-5.907 ^a	I(1)

Notes a, b and c denote the rejection of the null hypothesis at 1%, 5% and 10% significance levels, respectively, while n denotes Not Significant

Also, the correlation analysis was conducted to scrutinize the magnitude and severity of multi-collinearity among the explanatory variables in the empirical model. A correlation coefficient between any pair of explanatory variables whose magnitude is greater than ± 0.80 are said to be highly collinear (Babu et al. 2020). Table 2 displays the Spearman rank-order correlation test findings.

From Table 2, there is no evidence of any substantial multi-collinearity or linear dependency between the explanatory variables of the estimation model. The



maximum correlation between any paired regressors was found to be 79%, which is less than the generally acceptable threshold of 80%.

Although the ARDL bounds testing approach does not rely on prior knowledge about the order of integration of the series under investigation, it is, however, prudent to test for the stationarity status of all variables to guarantee that none of the study variables are I(2) stationary in order to obtain reliable results. To avoid a wrong application of the ARDL technique, the study implemented the traditional Augmented Dickey-Fuller (1979), Phillips-Perron, (1988) and the Zivot and Andrews (1992) structural breaks unit root tests to take full responsibility for unobserved heterogeneity in the variables studied and show how sensitive the estimated results are to structural changes. The unit root test results of the study variables are summarized in Table 3.

The study can appropriately deduce from the results in Table 3 that none of the study variables are integrated of order two. The explanatory variables were detected to be either level or first difference stationary while the dependent variable achieved stationarity only after first differencing under the conventional and structural break unit root tests. The combination of I(1) and I(0) variables offered theoretical justification for the use of the ARDL approach to test for co-integration.

ARDL Bounds Test for Co-integration

The ARDL bounds test approach is based on the F-test for determining the presence of long-run relationship between the variables under investigation, and it tests for the joint significance of lagged level variables included in the model. The choice of the correct lag length is critical for the relevance of the F-test results. The study's observations are annual, and the sample size is 40 with 12 parameters. Because of the small number of observations and the necessity to maintain degrees of freedom, an ideal lag length of 1, 2 was chosen and imposed on the dependent variable and the regressors using the Akaike Information Criterion (AIC). The study, therefore, estimated Eq. (1) with the lag structure (1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 0) being the most efficient of the estimated models. The results obtained from the ARDL bounds testing approach and the estimated F-test are contained in Table 4.

Table 4 indicates that the calculated F-statistic of 16.115 is greater than the upper bound critical value of 3.61 at the one percent significance level, evidencing the fact that a significant long-run relationship exist between economic growth and the socio-economic influencers of insecurity in Nigeria explicitly captured in Eq. (1). This implies that these variables move together in the long run, and that any short-run departure in their interactions will return to equilibrium in the long run.



Table 4 ARDL bounds test for co-integration results

Model	<i>F</i> -statistic	<i>K</i>	Critical values		Decision	
			%	Lower Bound <i>I</i> (0) Upper Bound <i>I</i> (1)		
LnRGDP = f(FDI, GFCF, GTD, INFR, INS, LnFRR, LnGEE, LnGHE, LnGSS, LnPCI, UMP)	16.115	9	1%	2.41	3.61	Reject H_0 and accept H_A Co-integration exists
			2.5%	2.18	3.28	
			5%	1.96	3.04	
			10%	1.76	2.77	



Table 5 Estimated ARDL long-run coefficients. Dependent variable: LnRGDP

Regressors	Coefficient	Std. Error	<i>t</i> -Statistic	<i>P</i> -Value
FDI	- 0.0670	0.0055	- 12.1683	0.0000
GFCF	- 0.0033	0.0009	- 3.6793	0.0103
GTD	0.0079	0.0009	9.8028	0.0001
INFR	0.0154	0.0012	12.8129	0.0000
INS	- 0.1932	0.0451	- 4.2876	0.0052
LnFRR	0.0314	0.0032	9.8229	0.0001
LnGEE	- 0.5522	0.0299	- 18.4238	0.0000
LnGHE	0.6216	0.0450	13.8107	0.0000
LnGSS	- 0.6264	0.1107	- 5.6568	0.0001
LnPCI	0.5746	0.0396	14.5235	0.0000
UMP	- 0.0034	0.0007	- 4.9717	0.0025
C	12.5878	0.6302	19.9752	0.0000

Long-Run Effects of Insecurity on Economic Growth in Nigeria

To determine the long-run effects of insecurity on economic growth in Nigeria, the study estimated the conditional ARDL long-run model for Eq. 1. The long-run estimated results are displayed in Table 5.

From Table 5, the estimated coefficient of Foreign Direct Investment (FDI) indicated a significant negative relationship with long-term economic growth. Nigeria, as a developing country with poor domestic capital formation and a scarcity of vital infrastructure, requires considerable inflows of foreign direct and portfolio investment to spur growth. The country has become increasingly unattractive to foreign investors caused by growing insecurity, shortage of critical infrastructures and the relocation of multinational companies to neighbouring countries. No investor, whether domestic or foreign, will be inspired to invest in a risky and insecure environment. The risk and uncertainty associated with rising level of insecurity in Nigeria has resulted in the redirection of foreign direct investments away from Nigeria to other West African countries which negatively affect growth. The government's apparent incapacity to provide a secure and safe environment for people, property, and the performance of business and economic operations and the country's dismal economic state is responsible for the gradual withdrawal of Portfolio as well as foreign direct investment from Nigeria to other West African countries which adversely affect government revenue generation. The result is in concord with previous studies of Edeme and Nkaku (2019) and Nguyen. (2020) who reported a significant negative impact of FDI on economic growth of Nigeria and Vietnam, respectively.

The estimated coefficient of Gross Fixed Capital Formation (GFCF) displayed a significant negative relationship with long-term economic growth at one percent probability level. Based on Table 5, a percentage increase in domestic capital formation will *ceteris paribus*, generate a decrease of about 0.003% in long-run economic growth. Terrorist activities create economy-wide risks and uncertainties that distort the equilibrium resource allocation within a country by changing individuals'



savings, investment and consumption behaviour. Terrorist attacks can destroy infrastructure, thereby leading to business disruptions and raising the cost of doing business in a country. These higher costs result in reduced profits and, thus, smaller return on investment. Insecurity is a drag on economic progress, frustrating and undermining domestic investment in Nigeria because of its evident negative effects on long-term growth. With the country's widespread and systemic security challenges and the seeming incapacity of the state to ensure safety and security, numerous factories have been burnt, lives and properties have been lost, investors have fled, and many enterprises have relocated or shut down. All of these impediments stifle domestic capital formation and private investment in Nigeria consequently inhibiting long-term economic growth. The finding sanctions a priori expectation but contradicts extant studies of Apanisile and Okunlola (2014) and Babu et al. (2020) who reported a significant positive relationship between domestic capital formation and long-term economic growth in Nigeria and Sub-Saharan African countries, respectively.

The long-run coefficient of Public Debt (GTD) demonstrated a positive impact on economic growth that was significant at one percent level. From Table 5, a percentage point increase in total debt stock holding other explanatory variables constant triggered an increase of about 0.008% in long-term economic growth. Prolonged period of insecurity can destroy part of the tax base and reduce government revenue generation thereby increasing deficit financing. The use of government borrowing to support increased public expenditures can boost the nation's productivity by allowing for increased investment in physical and social infrastructure. The findings support neoclassical investment theory, which emphasizes that government borrowing is an important tool for financing capital formation and might be utilized to successfully increase economic growth if productively employed to fund vital infrastructures that increase efficiency. The result is in agreement with earlier studies of Edeme and Nkalu (2019) and Amana et al., (2020) who reported a significant positive impact of public debt on economic growth of Nigeria in the long run.

From Table 5, the long-run coefficient of Inflation Rate (INFR) prompted a positive impact on economic growth that was significant at one percent level. A percentage increase in the general price level with other things remaining equal, stimulate an increase of about 0.015% in long-term economic growth. Rising prices weakens disposable income and push people into poverty. As consumers' income get eroded as a result of rising prices, their ability to demand for goods and services get deteriorated leading to a fall in standard of living. High inflation rate in the face of lack of economic opportunities can increase frustration and discontent among the populace which provokes aggressive behaviour. Though controlling inflation is vital to ensure macroeconomic stability, the results in violation of a priori expectation suggest that a slight increase in the general level of prices of goods and services will stimulate long-term growth. The result is in accord with the findings of Apanisile and Okunlola (2014) but contradicts the findings of Micheal et al., (2019) and Nguyen (2020) who reported a significant negative relationship between inflation rate and long-term growth in Nigeria and Vietnam, respectively.

From Table 5, the coefficient of the Level of Insecurity (INS) prompted a robust negative relationship with long-term economic growth that was significant at



one percent level. Accordingly, a unit increase in the level of insecurity and poverty, other things remaining equal, engendered about 0.19% decrease in long-term growth. Insecurity has a direct negative effect on the economy through the destruction of human and physical capital. Terrorist activities reduce the capital stock of a country, increase levels of uncertainty, and alters the composition of government expenditure by inducing more spending on defence and military components vis-a-vis other components of government spending. The result is in tandem with the findings of Gupta et al., (2004), Ikechukwu (2019), Edeme and Nkaku (2019) and Chuku et al. (2019) who reported a significant negative impact of insecurity on economic growth of Nigeria. The escalating level of insecurity in Nigeria by disrupting the allocation of scarce resources to the protection of lives and properties thereby threatening the desperate attempt to industrialize, the existing socio-cultural tranquillity and sustainable growth.

The estimated long-run coefficient of federal government retained revenue (LnFRR) showed evidence of a positive effect on economic growth that was statistically significant at one percent level. From Table 5, a percentage increase in total federally retained revenue, other things remaining equal, motivated an increase of about 0.03% in long-term growth. The escalating level of insecurity in Nigeria has resulted in the loss of over N1.4 billion to N1.6 billion in business and commercial assets between 2015 and 2018, as well as a decline in daily oil production from 2.2 million to 1.5 million barrels per day in 2018, leading to low government revenue generation. The study result in violation of a priori expectation indicated evidence of a positive relationship between government revenue and economic growth. In today's globalized international order, the effects of terrorist activities in one country can reverberate positively or negatively in the economy of different countries, Nigeria being a resource dependent economy might have benefited positively from the oil windfall occasioned by various act of instability in other oil producing countries. The result suggests that the more revenue at the disposal of government the better equipped it is to provide security of lives and properties for its citizens by delivering economic infrastructures and basic physiological needs that reduces poverty and stimulate long-term growth. The result is consistent with the findings of Edeme and Nkaku (2019) and Ayange et al., (2020).

The estimated coefficient of Government Expenditure on Education (LnGEE) indicated a significant negative relationship with long-term economic growth at one percent probability level. Based on Table 5, a percentage increase in education spending will ceteris paribus generate a decrease of approximately 0.55% in long-run economic growth. In order to mitigate terrorism, increased government spending on security can crowd out more growth-enhancing public and private investments in social sectors such as health and education, which in turn can affect the long-run growth of a nation adversely. Moreover, there is evidence that insecurity endangers growth of real per capita income and thereby growth in government revenue, resulting in lower growth of real per capita government spending on education which in turn has an adverse impact on economic growth. When people are deprived of access to quality education, hungry and not sure of where the next meal will come from, they can become increasingly more rebellious, aggressive and violent. Nigeria needs a well thought out process to combat leadership failure, poor governance



system and better secure the country. Procuring all the weapons in the world will not bring an end to insecurity unless governance is improved. The result is in agreement with the findings of Evans and Kelikume (2019); Edeme and Nkaku (2019).

The estimated coefficient of Government Expenditure on Health (LnGHE) indicated a significant positive relationship with long-term economic growth at one percent probability level. Based on Table 5, a percentage increase in health spending will, other things remaining equal, stimulate an increase of about 0.62% in long-term economic growth. Terrorism is likely to induce counter-terrorism expenditure, thereby diverting expenditure from production-related activities to defence-related activities, which are generally considered to be less productive. An increase in government security expenditure can, however, promote economic growth by increasing human capital capabilities through provision of education, expansion of aggregate demand through increase security. The result indicated that improved access to social and welfare services could significantly reduce the level of insecurity and inspire inclusive growth in the long term. This is in agreement with the findings of Evans and Kelikume (2019), Ayange et al., (2020).

The estimated long-run coefficient of Government Security Spending (LnGSS) consistent with a priori expectation was accompanied by a negative effect on economic growth and is significant at one percent level. Based on Table 5, a percentage point increase in government security spending activated a decrease in economic growth of approximately 0.63%. An increase in government security expenditure can negatively affect growth by crowding-out scarce fiscal resources needed for productive investment in other critical sectors of the economy. Insecurity is insidious and grows from one stage to another. It is one thing to get the equipment you need to combat terrorism and another thing to get the desired results. Nigeria's counter-terrorism operations put primacy on military strategy instead of focusing on the things that prevent insecurity. Security is not a gadget you buy in the shelf but a product of premeditated planning. Nigeria's defence budget has increased significantly during the last two decades while the threat of insecurity appeared to be worsening and fast evolving into an existential crisis that is shaking the foundation of its nationhood. A disproportionately large security expenditure would normally come at the expense of social service provision, crowding-out scarce fiscal resources to other growth-enhancing sectors of the economy. The inverse relationship between government security expenditures and economic growth in Nigeria can be linked to a variety of factors such as the lack of transparency in military purchases. There is also evidence of lax monitoring, controls and audits of the military budget, allowing corruption and waste to flourish. The result is consistent with the findings of Edeme and Nkaku (2019), Ayange et al., (2020) and Laniran and Ajala (2021).

The estimated long-run coefficient of Per Capita Income (LnPCI) displayed a positive effect on economic growth that was significant at one percent level. From Table 5, a percentage increase in per capita income produced an increase in economic growth of approximately 0.57%, other things remaining equal. The result indicated that a more equitable income distribution can improve economic well-being and reduce violent crimes in Nigeria. The latent capacity of the poor for entrepreneurship would be significantly enhanced through a more equitable distribution of income. The increasing inequality and uneven development in the country are



helping to fuel various forms of insecurity. Imbalanced development that involves horizontal inequalities is an important source of conflict and, that is costing Nigeria the opportunity to be the giant nation that it can and should be. It stands to reason that an improvement in income distribution and general quality of life in Nigeria will reduce the level of insecurity and inspire long-term inclusive growth. The result is consistent with a priori expectation and various earlier studies of Edeme and Nkalu (2019) and Evans and Kelikume (2019).

The estimated long-run coefficient of unemployment (UMP) was rightly signed and demonstrated a negative effect on economic growth that was significant at one percent probability level. From Table 5, a percentage increase in unemployment rate holding other explanatory variables constant, triggered a decrease of approximately 0.003% in long-run economic growth. Escalating level of unemployment can exacerbate poverty and increase the level of insecurity. Nigeria's unemployment and youth unemployment rate in 2020 according to the National Bureau of Statistics (NBS 2021) is 33.3 and 53.4%, respectively. This suggests that 33.3% of Nigeria's labour force, including 53.4% of the youth population, lacks economic opportunities and earn no income. The country is also ranked among the countries with

Table 6 Error correction representation for the selected ARDL model ARDL (1, 1, 2, 2, 2, 2, 2, 2, 0)

Regressors	Coefficients	Std. Error	t-Statistic	P-value
D(FDI)	- 0.0045	0.0021	- 2.2159	0.0686
D(GFCF)	- 0.0160	0.0008	- 20.3277	0.0000
D(GFCF(- 1))	0.0318	0.0015	21.4240	0.0000
D(GTD)	0.0122	0.0005	23.5671	0.0000
D(GTD(- 1))	- 0.0021	0.0002	- 9.1582	0.0001
D(INFR)	- 0.0127	0.0005	- 23.6362	0.0000
D(INFR(- 1))	- 0.0116	0.0005	- 23.9796	0.0000
D(INS)	- 0.0725	0.0086	- 8.4326	0.0002
D(INS(- 1))	- 0.0222	0.0088	- 2.5258	0.0449
D(LnFRR)	- 0.0308	0.0018	- 17.2576	0.0000
D(LnFRR(- 1))	- 0.0516	0.0027	- 19.3764	0.0000
D(LnGEE)	- 0.4127	0.0192	- 21.4561	0.0000
D(LnGEE(- 1))	0.1594	0.0096	16.5274	0.0000
D(LnGHE)	0.5314	0.0233	22.7731	0.0000
D(LnGHE(- 1))	- 0.2435	0.0134	- 18.1400	0.0000
D(LnGSS)	- 0.1088	0.0120	- 8.4896	0.0001
D(LnGSS(- 1))	- 0.1087	0.0102	- 10.6168	0.0000
D(LnPCI)	1.3298	0.0497	28.7421	0.0000
D(LnPCI(- 1))	- 0.5115	0.0231	- 22.1802	0.0000
D(UMP)	- 0.0060	0.0007	- 9.0201	0.0001
CoIntEq(- 1)	- 0.4251	0.0303	- 14.0135	0.0000***

CoInteq=LnRGDP- (0.0670*FDI- 0.0033*GFCF+0.0079*GTD+ 0.0154*INFR - 0.1932*INS+0.0314*LnFRR- 0.5522LnGEE+ 0.6216*LnGHE - 0.6264*LnGSS+0.5746*LnPCI - 0.0034*UMP+12.5878)



the highest number of severely impoverished nations in the world, with substantial income disparities despite its enormous human and material resources. Government has a responsibility to create the enabling and secured environment for businesses to flourish and provide jobs. When the government have little or no economic plan to be able to reverse the growing unemployment, you are likely to create a very fertile ground for the employment of large army of unemployed youths by those who have violent intentions. The absence of economic prospects and earning power associated with high levels of youth unemployment degrades or undermines the quality of life, promoting anger, dissatisfaction and other negative tendencies among young people. The cumulative result of this deviant behaviour is a slowing of economic growth. The result is consistent with theoretical expectation of the study and extant findings of Evans and; Kelikume (2019), Nkwatoh and Nathaniel, (2018), Brodeur. (2018).

Short-Run Effects of Insecurity on Economic Growth in Nigeria

After estimating the long-run coefficients, the ARDL model uses the lagged values of all variables in Eq. (1) (a linear combination denoted by the error-correction term (ECT)) to estimate the model's short-run dynamics associated with the long-run relationship. Table 6 displays the outcomes of the estimating method.

According to Table 6, the model's error-correction term is highly significant and appropriately signed. The error-correction term has a coefficient of -0.4251 , implying that around 42% of the deviations from the long-run growth rate in output caused by previous years' shocks converge back to long-run equilibrium in the present year. It was also negative, significant, and lesser than one, implying that the predicted coefficients from this study can be used to make policy choices. The result supports the presence of a long-run relationship between economic growth and the analysed enablers of insecurity in Nigeria, suggesting that a secure and stable economic and business climate fosters long-term growth.

From Table 6, the current level of foreign direct investment inflow $D(\text{FDI})$ in agreement with the long-run result indicated an insignificant negative impact on growth. With increasing levels of insecurity in Nigeria, the level of FDI inflow has continued to decline. Gross fixed capital formation in the current period $D(\text{GFCF})$ in harmony with the long-run result activated a negative impact on the present level of growth while its one-year lag value $D(\text{GFCF}(-1))$ was positively related to the present level of economic and both significant at one percent level. A percentage increase in the current level of domestic capital formation decreases the current rate of economic growth by about 0.016% while a percentage increase in the one-year lag value of the variable increases the current rate of growth by around 0.032%.

Also, the present level of government total debt $D(\text{GTD})$ in conformity with the long-run results generated a significant positive relationship with the existing rate of economic growth while its one-year lag coefficient displayed a positive impact on the current rate of growth that was significant at one percent probability level. A percentage increase in the current level of public debt was associated with an increase of approximately 0.012% while a percentage increase in the one-period lag value of the variable decreases the current rate of growth by about 0.032%.



From Table 6, the estimated coefficient of current rate of inflation $D(INFR)$ and the one-period lag ($D(INFR(-1))$) value of the variable in disagreement with the long-run results elicited a significant negative impact on the current rate of economic growth at one percent probability level, respectively. A percentage increase in the current and previous rate of inflation decreases the current rate of growth by about 0.013 and 0.012%, respectively. Insurgency, armed banditry and farmers-herders' crisis has resulted to loss of lives, damaged to critical infrastructures and displaced millions of farmers from their farmlands leading to rising food prices. Rising prices weakens disposable income and push people into poverty. As consumers' income get eroded as a result of rising prices, their ability to demand for goods and services get deteriorated leading to a fall in standard of living.

Based on Table 6, the current rate of insecurity $D(INS)$ and its one-year lag $D(INS(-1))$ value in solidarity with the long-run result both prompted a significant negative impact on the current rate of economic growth that was significant at one and 5%, respectively. Accordingly, a percentage increase in the current and previous level of insecurity created a decrease of approximately 0.07 and 0.02% in the present rate of economic growth, respectively.

The estimated coefficient of the current level of federally retained revenue $D(LnFRR)$ and the one-period lag of the variable $D(LnFRR(-1))$ in disparity with the long-run results both triggered a significant negative impact on the present rate of economic growth and were both significant at one percent probability level.. From Table 6, a percentage increase in the current level of federally retained revenue is associated with a decrease of about 0.03% while an increase in the previous level of government revenue initiated an increase of around 0.05% in the present rate of growth. Increasing level of insecurity can destroy part of the tax base, endanger the growth of government revenue and depress the present rate of growth, For many years, Nigeria has been plagued by a succession of incompetent leaders, resulting in mismanagement of scarce fiscal resources, criminal neglect of the population and widespread poverty, all of which endanger the nation's security. Nigeria has the resources to meet her people's requirements, but corruption in public offices at all levels has made it hard for public office holders to focus on meeting the people's basic requirements. Prudent utilization of government revenue in improving access to social and welfare services can reduce poverty, mend security and encourage inclusive growth.

The estimated coefficient of the present level of Government Expenditure on Education $D(LnGEE)$ in accord with the long-run results indicated a significant negative impact on the current rate of economic growth that was significant at one percent probability level. However, the coefficient of the one-year lag of education spending $D(LnGEE(-))$ showed a positive and significant impact on the current level of growth. Accordingly, a percentage increase in current education spending produced a decrease of about 0.41% in the present level of growth while a percentage increase in previous level of education spending generated an increase of around 0.15% in the current level of economic growth.

Similarly, the coefficient of the present level of Government Health Expenditure $D(GHE)$ in accord with the long-run results exhibited a significant positive relationship with the current rate of economic growth that was significant at one percent



level. Thus, a percentage increase in the present rate of government health expenditure motivated an increase of approximately 0.53% in the current level of economic growth. Conversely, the coefficient of the one-year lag of government health spending $D(\text{LnGHE}(-))$ validated a negative and significant impact on the current level of growth at one percent probability level. Consequently, a percentage increase in the previous level of health spending elicited a decrease of around 0.24% in the present level of economic growth.

Furthermore, the current $D(\text{LnGSS})$ and one-year lag level $D(\text{LnGSS}(-1))$ of government security spending in conformity with the long-run result both displayed a negative and significant effect on short-term growth at one percent probability level. Hence, a percentage increase in the present and previous level of security spending both engendered a decrease of almost 0.11% in the current rate of economic growth. The results showed that increase in current level of government security spending by crowding-out scarce fiscal resources to other growth-enhancing sectors of the economy, significantly decreases the current level of economic growth. Despite increased budgetary allocations to security in recent years, the country has continued to witness an upsurge in violent crimes and various forms of insecurity. This explains why it is almost impossible to cure a problem based on violence with violence. The use of military/force to deter security concerns by Nigeria's government has not achieved much in stemming the tide of insecurity which creates the impression that the government is not doing enough to secure the people. Curtailing the plethora of security challenges in Nigeria would require a combination of military approach and a dynamic, effective and responsible leadership that has the courage to tackle various forms of socio-economic deprivations from their root causes. A disproportionate security expenditure can ultimately impede economic efficiency, notwithstanding the significance of security for economic growth.

The coefficient of Per capita income $D(\text{LnPCI})$ in support of the long-run result prompted a positive and significant impact on economic growth in its present value at one% probability level but the one-period lag of per capita income $D(\text{LnPCI}(-1))$ indicated a negative and significant impact on the current level of economic growth. Consequently, an increase in the current level of per capita income motivated an increase of about 1.33% in the present rate of economic growth at one percent significance level while an increase in the one-period lag of per capita income produced a decrease in the current rate of economic growth of about 0.51%, respectively. The coefficient of present level of unemployment $D(\text{UMP})$ in accord with the long-run results exhibited a significant negative relationship with the current rate of economic

Table 7 ARDL model diagnostics tests indicators

Test	Null hypothesis	<i>F</i> -statistic	<i>P</i> value
Jarque-Bera	There is Normal Distribution	0.2494	0.8827
Breusch Godfrey	No Serial Auto-Correlation	2.0060	0.1741
Breusch-Pagan-Godfrey	No Heteroscedasticity	0.6258	0.8453
Ramsey RESET	No misspecification	1.2378	0.2361



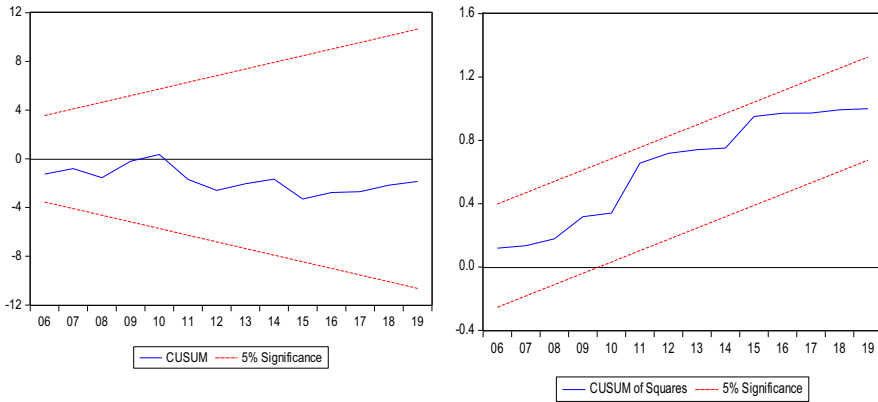


Fig. 1 Stability Test (CUSUM) TEST Stability Tests (CUSUM) of squares Test. Justification of Study Variables. RGDP is the dependent variable measured in millions of Nigerian Naira. It is the socio-economic indicator employed in this analysis to evaluate annual economic growth during the review period. According to theoretical literature, RGDP can be utilized as a precise gauge of economic growth. It is an inflation-adjusted measure that represents the value of all final products and services produced each year expressed in a base year price. FDI is a control variable used in the model to assess the impact of insecurity on the level of foreign capital inflow and their ripple effect on growth. FRR in millions of Nigerian Naira measures the financial strength and resources available to the federal government of Nigeria to address the myriads of socio-economic challenges confronting the nation. GFCF is investment in fixed assets funded with money raised via the stock market. Following IMF (2018), the GFCF was adopted as a proxy for the level of private investment. GEE in billions of Naira was used as a proxy for the level of human capital development and its impact on economic growth in Nigeria. GHE in billions of Naira is a fiscal and conditioning variable to evaluate the level of social and welfare services provided by the government and its effect on growth. GSS, measured in millions of USD, includes all current and capital expenditures on the armed forces, including peacekeeping forces, defence ministries and other government agencies engaged in defence projects. GTD was included in the model as a fiscal and conditioning variable for government revenue. Growing security concerns has made it extremely difficult to meet government spending plan solely through tax collection. Public debt has become imperative for financing government operations to stimulate the economy. INFR measures the annual percentage increase in consumer prices. It was adopted as a conditioning variable to control for the instability in price changes which affects business forecasts and standard of living of the populace. INS is a dummy variable included in the model to test for the effect of escalating level of insecurity on economic growth in Nigeria. The variable was measured with an index of 1 in years 1980 to 1982 during the Maitatsine crisis and 2009 through 2019 for the duration of the Boko Haram insurgency and zero for other years. PCI in USD was adopted as a proxy for inequality in income distribution and poverty level. Poverty is pronounced deprivation in well-being and includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity (d’Agostino, et al. 2016). UMP measures the number of unemployed persons as a percentage of the labour force. It refers to those who are currently not working but are willing and able to work for pay

growth that was significant at one percent level. Thus, a percentage increase in the present rate of unemployment stimulated a decrease of about 0.006% in the current level of economic growth.



Post Estimation Diagnostics Tests

The results of this study were subjected to several econometric diagnostics tests associated with data normality, serial correlation, heteroscedasticity, functional form and stability checks. The Jarque–Bera, Breusch-Godfrey Serial Correlation LM Test, Breusch-Pagan-Godfrey, Specification tests (Ramsey RESET test), CUSUM and CUSUM of Squares tests were the econometric tools employed for these tests. The estimated diagnostic indicators are summarized in Table 7.

The diagnostics test statistics in Table 7 revealed that the model's residuals are normally distributed, with no significant evidence of multi-collinearity, serial correlation, heteroscedasticity, or model misspecification error. As the aforementioned attributes are desirable qualities of OLS models, the model was properly specified. The CUSUM and CUSUM of squares tests (Figs. 1 and 2) suggests that the estimated model parameters are within the critical boundaries at 5% significance level, accepting the null hypothesis that all coefficients and the ECM are dynamically stable and the estimated findings are reliable and adequate for forecasting and policymaking.

Conclusion and Policy Implications

States exist to provide certain public goods to those living within their borders. The most important of these is the creation of a safe and favourable environment that ensures lives, livelihoods and investment. Insecurity has reached frightening proportions in Nigeria, rearing its ugly head in numerous aspects of our national life. Day after day, lives are lost, the population is depleted, businesses are paralysed, investments are plummeting, multinational corporations are shutting their operations and leaving the country, unemployment is skyrocketing, and the citizenry terrified and acutely impoverished. Clearly, this represents a severe threat to Nigeria's government and economic growth. Using the ARDL technique, this study undertook an empirical examination of the relationship between the enablers of insecurity and economic growth in Nigeria during a 40-year period from 1980 to 2019. The empirical results indicated that high unemployment rate, domestic capital formation, foreign direct investment, government security and education spending are negatively affected by the growing level of insecurity and, thus, retarded growth in the long and short run. Conversely, improved health services, equitable income distribution and productive use of public borrowing to improve access to socio-economic infrastructure were positively correlated with security and, therefore, stimulated growth in the long and short run. Government revenue and inflation rate accelerated growth in the long run while their short-run effect was deleterious. The error-correction term suggested a 42% speed of adjustment to any disequilibrium in the long run.

The study findings have policy implications for good governance and effective leadership. Governance is a call to selfless dedication, a call to generate ideas, formulate policies and put them into action in order to build a nation state whose citizens can meet their basic needs, not just a means of acquiring opulence. Nigeria has a large neglected youthful population, dilapidated infrastructures and social services.



The lack of effective leadership, solid institutions, embellished political irresponsibility and crookedness has been Nigeria's key difficulties since independence. Good governance, provision of a safe and secured environment for human capital development, improved access to social and economic services is the starting point to inclusive growth of any economy.

To the extent that the results of this study are regression estimates based on Nigeria data, it is important to draw policy implications from the results with some degree of caution. The results suggest that the impact of terrorist activities should be systematically taken into account when preparing government budgeting and expenditure plans. From the study findings, it is evident that an effective growth strategy that addresses the various forms of socio-economic deprivations has not been developed to tackle various forms of security challenges in Nigeria. The traditional state-centric and militaristic tactics have guided the government's counter-terrorism programme, thus far. Unless a more robust counter-terrorism strategy involving kinetic and non-kinetic means is implemented alongside major governance and political reforms aimed at reversing Nigeria's historic, social and economic imbalance, the predominantly military approach to countering various forms of insecurity in Nigeria could continue to create tensions between the government and the populace. The study, therefore, suggests that policy makers should, in order to prevent or combat terrorism, focus on improving the economy by improving access to socio-economic infrastructures that reduce poverty, creating job opportunities through provision of conducive environment that supports businesses and reduces inequality gaps. Although the current study provides remarkable insights on the fiscal and socio-economic impacts of insecurity on Nigerian economic growth, it is susceptible to significant limitations, mostly related to data availability and the econometric technique. Future research could look into a comparative assessment of the effects of insecurity on agricultural output and food security in Nigeria's various geopolitical zones using additional variables.

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Declarations

Conflict of interest Abdulkarim Yusuf declares that he has no conflict of interest. Saidatulakmal Mohd. declares she has no conflict of interest and the paper has not been previously published or presently under review elsewhere.

Research Involving Human and Animal Rights This article does not contain any studies with human participants or animals performed by any of the authors. The study uses secondary data sources obtained publicly from the Central Bank of Nigeria, Debt Management Office and World Development Indicators statistical database and is not sensitive in any way to any vulnerable group(s).



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