

Economic Impact of Terrorism on Nigeria: An Empirical Evidence from North-Central States

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Abstract

This study examined the economic impact of terrorism across states in North-central zone of Nigeria for the period 2009–2021. Following an autoregressive distributed lag analysis, impact relationships are examined. The model was estimated with macroeconomic variables (including population growth rate, number of persons killed in terrorist attacks, terrorism index) and economic growth as the dependent variable. Empirical evidence indicated that while population growth rate has positive effect on economic growth, number of persons killed in terrorist attacks, and terrorism index, has negative effect on economic growth. The study recommends that **systematic checks on Nigerian external borders** on all people entering Nigeria-including Nigerian citizens – should be introduced. Governments of states in the North-Central zone, should as a matter of urgency and importance, promote dialogue and co-operation on counter-terrorism issues, in particular, through public-private partnerships between the states authorities and the private sector (business community, industry), as well as civil society and the media. The states should also strengthen national efforts to implement United Nations Security Council resolution 1540 (2004) on non-proliferation of weapons of mass destruction.

Keywords: *Ethnic Crises, Socio-Economic Crises, Health, Education, Income generation*

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Background to the Study

Terrorism can impose costs on a targeted country through a number of avenues. Terrorist incidents have economic consequences by diverting foreign direct investment (FDI), destroying infrastructure, redirecting public investment funds to security, or limiting trade. If a developing country loses enough FDI, which is an important source of savings, then it may also experience reduced economic growth. Just as capital may take flight from a country plagued by a civil war (Collier et al., 2003), a sufficiently intense terrorist campaign may greatly reduce capital inflows (Enders & Sandler, 1996). Terrorism, like civil conflicts, may cause spillover costs among neighboring countries as a terrorist campaign in a neighbor dissuades capital inflows, or a regional multiplier causes lost economic activity in the terrorism-ridden country to resonate throughout the region. In some instances, terrorism may impact specific industries as 9/11 did on airlines and tourism (Drakos, 2004; Ito and Lee, 2004). Another cost is the expensive security measures that must be instituted following large attacks – e.g., the massive homeland security outlays since 9/11 (Enders and Sandler, 2006). Terrorism also raises the costs of doing business in terms of higher insurance premiums, expensive security precautions, and larger salaries to at-risk employees.

The remarks above are corroborated by Harrison and Mohib (2021) when they stated that beyond the immediate impact, terrorism produces disruptions to the broader economy that may only appear days, weeks or months after the terrorist incident. Depending on the scale and frequency of the terrorist events within a country, the economic impact of terrorism on growth, investment, consumption and tourism is a serious threat to the economic development and growth of a country. The broader implications of terrorism also depend on the ability of the economy to reallocate resources from the affected sectors smoothly. Terrorism alters economic behaviour, primarily by changing investment and consumption patterns as well as diverting public and private resources away from productive activities and towards protective measures. Terrorism destroys capital and reduces the economic capacity of the country affected.

Empirical studies on Africa by Blomberg et al. (2004), and Akhmet et al. (2014) have recorded those economic conditions as important determinants of terrorism. Furthermore, Meierrieks and Gries (2013), found terrorism as detrimental to growth for Africa, for the post-Cold War era. Given these evidences both of the factors; underdevelopment and terrorism are considered as hazardous for the health of economy. Africa experienced 978 deadly terrorist attacks in 2011, 11133 in 2012 and 17958 in 2013. It includes both domestic and transnational terrorist incidents. In African countries, though poverty is prevailing since longer time but terrorism is now fueling it by leaving people destitute through destruction of property, shelter, markets and collapse of business activities. Most of the countries in Africa are referred to as fourth world which according to Global Terrorism Report, (2014), are poorer in the list of world poor countries. Lipset (1960), about poverty-terrorism nexus seems true for poor African countries, which counts for large scale terrorism not only within the African region but also, across the globe.

Terrorism in Nigeria, especially recent has regularly affected the lives and social relationships of people. The peak of terrorist activities in Nigeria in the recent years can be traced to the Boko Haram attacks. Approximately two million people have been internally displaced within states in Northern Nigeria including Borno, Adamawa and Yobe, while over 240,000 refugees to neighbouring African countries have been recorded (Bureau of Counterterrorism, 2019). 13,000 deaths are linked to Boko Haram terrorist attacks, putting the group among the deadliest terrorist groups in the world. Over 6 million Nigerians have been affected by terrorism (Ehwarieme and Umukoro, 2015).

Specifically, on 7th September 2010, the attack on a prison by a terrorist group in Bauchi led to the death of 5 persons and the release of 700 inmates. On 26th August 2011, about 23 people were killed by a car bump, while over 75 people were injured. Also, on 4th November 2011, over 100 lives were lost in several attacks in most Boko Haram based states include an attack on churches and markets and vehicles. January 20, 2012, marked the death of 200 people in terrorist attacks. The terrorist attacks on January 17, 2017, also left about 90 people dead. The attacks on July 27, 2019, February 9, and June 9, 2020, led to the death of over 195 persons (CNN Editorial Research, 2020).

Incidences of terrorist's activities, provoked mix of insecurity and threat to socio-economic undertaking in recent times. Separating realities from emotions, economic analysts hold the view that in the event of destruction of lives and properties in any society, investment and economic development will suffer. The impact of the activities of the group called Boko Haram on the economy of Nigeria cannot be over emphasized. Their activities have paralyzed almost all sectors of the country's economy. Generally, analysts agreed that terrorism had a suppressive effect on the economy and it has actually never done any good in any part of the World. In Nigeria, anyone can not mention of terrorism without reference to the activities of Boko Haram group would be incomplete. The terrorist activities of the group have created a lot of distortions to the economic activities in the Northern region in particular and the country as a whole. The direct implication of the activities of Boko Haram in Nigeria includes:

- i. Declining investor confidence and reductions in foreign direct investment. With reference to the 2014 Doing Business Data of the 183 economies sampled, Nigeria is ranked 167th. The implication is that no significant improvement has taken place because of terrorist activities;
- ii. A country that is experiencing a crisis of insecurity like that of Boko Haram activities will have her infrastructure being destroyed or at least neglected during the crisis. During the period of crisis, both manpower and physical development will be negatively affected. There would be high crime rates, interrupted education and negative health effects; and
- iii. Most manufacturers in Nigeria are totally devastated by the growing level of insecurity in the country. Ordinarily, insecurity at the level of armed robbery and kidnapping do not deter them but with the emergence of terrorism, which has become a growing phenomenon in the Northern part of the country. Manufacturers have been unable to cope and cannot sustain the prevailing conventional marketing channel dynamics (Koh, 2007). The implication of a reduced level of production is reduced earnings for

the manufacturing companies concerned. If this remains for a longer period of time the workforce would be threatened since there may be a compelling need for the firms to downsize (Adeniji and Adeyemi, 2016).

Literature Review

Conceptual Review

Terrorism is the use of or threat to use violence by individuals or groups of individuals to obtain a political or social objectives through the intimidation of a large audience, beyond that of the immediate victim. Although the motives of terrorists may differ across countries, their actions follow a standard pattern with terrorist incidents assuming a variety of forms including: airplane hijackings, kidnappings, assassinations, threats, bombings, and suicide attacks (Todd and Walter, 2006). Terrorist attacks are intended to apply sufficient pressures to a government so that it grants political concessions. If a besieged government views the anticipated costs of future terrorist actions as greater than the costs of conceding to terrorist demands, then a government will make some accommodation. Thus, a rational terrorist organization can, in principle, reach its goal quicker if it is able to augment the consequences of its campaign. These consequences can assume many forms including casualties, destroyed buildings, a heightened anxiety level, and myriad economic costs. Clearly, the September 11, 2001 (henceforth, 9/11) attacks on USA had significant costs that have been estimated to be in the range of \$80 to \$90 billion when subsequent economic losses in lost wages, workman's compensation, and reduced commerce are included (Kunreuther, Michel Kerjan and Porter, 2003).

Terrorism can be defined as the systematic threat or use of violence across national borders to attain a political goal or communicate a political message through fear, coercion or intimidation of non-combatant persons or the general public (Oladimeji and Oresanwo, 2014). Furthermore, the act of terrorism remains a human imposed disaster which purposefully aims at maximum random destruction and which is planned to systematically circumvent preventive measures. The United Nations (UN) and the US Department of Defense, also clearly defined terrorism as the unlawful use or threatened use of force or violence against individuals or property to coerce or intimidate governments or societies, often to achieve political, religious or ideological objectives. When viewed as a conflict resolution mechanism. Terrorism can be broadly viewed as a strategy deployed by individuals, either singularly or in groups, to resolve disputes. The basis of such disputes could be based on distributional issues (e.g., of political power, income, wealth) or merely existential-based on religious conflict-or have a foundation in the historical past causing persistent conflict (Elu and Price, 2015).

Destruction associated with terrorism can be grouped into direct destruction and indirect destruction. Direct destruction includes human capital destruction – which involves human injuries and killing, and physical capital destruction – which is the destruction of public infrastructures, destruction of goods and alteration of services (Saul, 2012; Quintana-Domeque and Ródenas-Serrano, 2014). The indirect destruction, on the other hand, includes the arousal of anxiety, fear, drop-in mental health, higher security expenditure, higher unemployment rates, increase in social expenditure, reduction in foreign direct investments

(FDI), etc. (Shah and Faiz, 2015). Direct or indirect, terrorism causes economic growth and developmental challenges in both developed and developing countries.

The Federal Bureau of Investigation (FBI) defined terrorism as the unlawful use of force and violence against persons or property to intimidate or coerce a government, civilian population or any segment thereof, in the advancement of political or social interests. Shukla (2009) claimed that terrorism would range from personality and environment based socioeconomic and political theories. This may be driven either for vengeance or financial gains from internal drives. This may also range from fundamentalism to poverty, political discontent, religious inequalities, and distrust of the current state, or interference in personal liberty, injustice, and inequality, as well as the poor government. Terrorism is a psychological tool concealed behind a political, economic or religious purpose such as that of Boko Haram, which seeks to enforce and practice Islamic law in northern Nigerian (Udama, 2013).

Theoretical Review

This study is anchored on Solow (1957) new classical model. The theory states that short-term equilibrium results from varying amounts of labor and capital in the production function. The theory also argues that technological change has a major influence on an economy, and economic growth cannot continue without technological advances.

Neoclassical growth theory outlines the three factors necessary for a growing economy. These are labor, capital, and technology. The neoclassical growth theory clarifies that temporary equilibrium is different from long-term equilibrium, which does not require any of these three factors.

The theory has however ignored the role of human capital in the determination of economic growth. To overcome this Mankiw, Romer and Weil (1992) has incorporated the human capital in the growth model. So, we can specify the model which states that economic growth (Y) is assumed to be a function of the stocks of physical capital (K), Labor force (PoP), Human capital (HC) and a vector of other variables (Z) including terrorism and technology.

$$Y=f(K, PoP, HC; Z) \text{-----} (1)$$

Empirical Review

Abadie and Gardeazabal (2003) tried to estimate the per capita GDP losses that are attributable to a twenty-year terrorist campaign. Because the Basque region differs from other regions in Spain, the authors had to construct a “synthetic” comparison region by taking a weighted average combination of other Spanish regions. The weights were chosen to yield the values to key growth variables – e.g., real per capita GDP, investment share of GDP, population density, and human capital measures – that are nearly identical to those of the Basque region prior to its terrorism. The authors demonstrated that the Basque and synthetic regions displayed similar per capita GDP values prior to 1975 and the start of the terror campaign. Thereafter, a GDP gap opened that averaged 10% over the next twenty years. During high-terrorism episodes, the gap exceeded 10%, while, during low-terrorism episodes, the gap

closed somewhat. This is a clever methodology where the synthetic region serves as the counterfactual control.

Drakos and Kutan (2003) applied the Enders-Sandler-Parise methodology to Greece, Israel, and Turkey for 1991-2000. These authors used monthly transnational terrorism data, drawn from ITERATE. In addition to the home-country impacts, the authors were interested in cross-country or “spillover” effect – both positive and negative – that may arise if, say, an attack in Israel shifts would-be Israeli tourists to safer venues in Italy, Greece, or elsewhere. Their ARIMA model with a transfer function had an equation for each country's tourist shares, where, say, the share of tourism in Greece depends on: past tourist shares in Greece; current and past terrorist attacks in Greece; current and past terrorist attacks in Israel; and current and past terrorist attacks in Turkey. There was also an equation for tourist shares of Italy, which was a relatively safe haven. Owing to transnational terrorist attacks, these authors calculated that Greece lost 9% of its tourism market share; Turkey lost over 5% of its tourism market share; and Israel lost less than 1% of its tourism market. Close to 89% of lost tourism due to terrorism in Europe flowed to safer tourist venues in other countries. The authors also uncovered significant spillover effects – low-intensity terrorist attacks in Israel reduced Greek tourism revenues.

Eckstein and Tsiddon (2004) applied a vector autoregression (VAR) methodology to investigate the effects of terrorism on the macroeconomy of Israel. These authors used quarterly data from 1980 through 2003 to analyze the effects of terrorism on real GDP, investment, exports, and nondurable consumer goods. Each of these variables served as a dependent variable in their four-equation VAR system. Their measure of terrorism was a weighted average of the number of Israeli fatalities, injuries, and noncasualty incidents. Their terrorism data included domestic and transnational attacks in Israel. They found that the initial impact of terrorism on economic activity was as short as a single quarter. Moreover, terrorism's impact on exports and investment was three times larger than on nondurable consumption and two times larger than on GDP.

Chen and Siems (2004) applied an event-study methodology to investigate changes in average returns of stock exchange indices to 14 terrorist and military attacks that dated back to 1915. An event study computes abnormal returns – negative or positive – following some shock 24 or occurrence, such as the downing of Pan Am flight 107 or 9/11. These authors showed that the influence of terrorist events on major stock exchanges, if any, is very transitory, lasting just one to three days for most major incidents. The sole exception is 9/11 where DOW values took 40 days to return to normal. These authors also showed that this return period varied according to the stock exchange – exchanges in Norway, Jakarta, Kuala Lumpur, and Johannesburg took longer to rebound, while those in London, Helsinki, Tokyo, and elsewhere took less time to rebound. Most terrorist events had little or no impact on major stock exchanges.

Abadie (2006), by incorporating both national and transnational terrorism found that terrorism has no relationship with economic variables. He concluded that countries in some

intermediary political freedoms are more prone to terrorism, especially a transition from the traditional authoritarian regime to democratic one is expected to be accompanied by oppression and temporary conflicts. This was consistent to the research of Krueger and Laitin (2008), and Piazza (2009), who, using data of U.S. State Department also found no significant impact of poverty on transnational terrorism. This insignificant relationship can attribute under-representation of terrorism data because transnational terrorism is a minor fraction of overall terrorism.

Meierrieks and Gries (2012) examined the relationship between country economic performance and terrorism for 18 Latin American countries from 1970 – 2007. They found that the link between terrorism and economic growth differs according to country development. Shabir, Naeem and Ihtsham (2015) examined the impact of terrorism on Pakistan's economic growth using Solow economic growth model. Using data on terrorism from Global Terrorism Database, co-integration analysis for the period 1981-2012 has been applied. The analysis suggests that terrorism has negatively affected the economic growth in Pakistan. Among the various variables that were used the terrorism is most significant and major contributor in reducing the economic growth. However, study finds that foreign assistance that is provided to Pakistan in the aftermath of the participations in Afghan war and the war against terrorism; in the shape of aid, grants and debt rescheduling etc. has a positive impact on the economic growth.

Adeniji and Adeyemi (2016) examined the impact of terrorism on Economic Development. This paper makes use of secondary data to explain some issues relating to terrorism and development. The study revealed that, the level of terrorism in Nigeria over the years has negative impact on the economic growth and development. The study recommended that, Social and Economic Development policies can weaken local support for terrorism Activities. Social and Economic Development can discourage Terrorism recruits. Social and Economic Development can act as a 'Stick' to discourage Terrorism.

Saddam, Bilal and Raees (2017) investigated poverty and terrorism as allies in hindering economic growth in African countries. This study uses data for 22 African countries from 1970 to 2013 i.e., 44 years. Data for terrorism, poverty and national income is taken from GTD and WDI. Panel cointegration techniques of dynamic fixed effect, mean group and pooled mean group are applied to quantify the long-run impact of terrorism and poverty on macroeconomic performance. Moreover, robustness is checked by using various estimators of slope parameters including POLS, FMOLS and DOLS. Empirical findings reveal that both poverty and terrorism have a long-run negative impact the macroeconomic performance. Recommendations for the double trouble are made at the end.

Shaheen et al. (2017) investigated the relationship between terrorism incidence, poverty issues, and economic growth in Pakistan for the period 1980–2015. The study applied unit root testing, cointegration, robust least square regression, Granger causality, and the impulse response function. Empirical results reveal that there is no significant relationship between terrorism and poverty, whereas a positive relationship exists between terrorism and economic growth.

Edeme and Nkalu (2019) who examined the growth and fiscal effects of terrorism in Nigeria. The study employed the simultaneous equation approach. It was found that terrorism is resulting in low economic growth. In Pakistan, Siddique, Liaqat & Ullah (2017) examined the effect of terrorism on domestic investment as well as foreign direct investment. The study covered the 1980 – 2015 sample periods. The autoregressive distributed lag bound testing co-integration approach was employed. The study found a long-run relationship between terrorism and investment. A negative effect of terrorism on both domestic and foreign investments was also found. Sami & Khattak (2017) examined the long and short-run impact of terrorism on the economic growth of Pakistan during 1980 – 2016. The study employed the Auto Regressive Distributed Lag (ARDL) approach to co-integration. The findings showed that terrorism huddles economic growth.

Unfried and Kis-Katos (2020) investigated the heterogeneous impact of conflict on education in sub-Saharan Africa with their Spatial Analysis. By integrating 66 rounds of DHS surveys with details about geo-coded conflict. The study identifies the conditions under which and to what extent armed conflicts endanger children's long-run educational achievement in rural Sub-Saharan Africa. The result reveals that high-intensity conflicts in strong autocracies reduce local educational achievement but are insignificant. However, low-intensity localized conflict doesn't affect education. To poor states, the lack of human resources is often felt seriously.

Harrison and Mohib (2021) estimated the economic impact of terrorism at \$US 33 billion in 2018. In the 18 years from 2000 to 2018, terrorism cost the world economy \$US 855 billion. This model follows the methodology of the 2019 Global Terrorism Index and uses a bottom-up cost accounting approach to aggregate the cost of four indicators that result from the incidents of terrorism. The four indicators include terrorism-related deaths, injuries, property damage and GDP losses. The findings of this paper show that global terrorism peaked in 2014 with 33,555 deaths globally and a consequential economic impact of \$US 111 billion. From 2011 to 2014, terrorism-related deaths increased by 353%, and terrorist incidents rose by 190%. The 100 incidents with the highest economic impact from deaths and injuries are included in the analysis. The September 11, 2001 attacks in the United States stands as the incident with the highest economic impact accounting for deaths and injuries only at \$US 40.6 billion, this is followed by the Sinjar massacre in Sinjar, Nineveh, Iraq at \$US 4.3 billion.

Oluwaseun, Ifeoma, Ebikabowei and Chika (2021) examined the impact of terrorism on economic growth and human capital development in Nigeria from 1981 – 2019. The Generalized Method of Moments (GMM) estimator was employed in analyzing the data. A negative and insignificant impact of terrorism on economic growth and human capital development was found. Internal and external conflict also had a negative and insignificant impact on economic growth and human capital development. Government expenditure as well had a negative and insignificant impact on economic growth and human capital development. Domestic investment had a positive and significant impact on economic growth, while its impact on human capital development was positive but insignificant. We, therefore, recommend establishing a bank of security to directly fund security in Nigeria. This

can contribute to remedying the terrorism situation. Also, establishing a bank of security can serve as a channel where armed forces and other security personnel who died in service to the nation can be compensated. This will encourage the armed forces in the battle against terrorism.

To the best of our understanding, very few studies have examined the impact of terrorism on economic growth in Nigeria. The closest study to our study is the study by Edeme & Nkaku (2019). This study, however, did not examine the impact of terrorism on economic growth in North-Central Nigeria. This is relevant, given the poor economic growth in the North-Central Nigeria, which can be attributed to the increasing terrorists' attacks that have led to thousands of deaths and kept thousands homeless. Our study also differs from previous studies in terms of methodology as well as variables in the estimated equations and indicators of the variables.

Methodology and Data

The study adopted ex-post facto design to investigate the impact of terrorism on economic growth in North-Central Nigeria during the 2009-2021. To this end, the study utilizes secondary data based on variables of the study. The method of analysis was based on cointegration to carry out the investigation. The data were collected from various sources including Global Terrorism Database (GTD), Central Bank of Nigeria (CBN) and National Bureau of statistics (NBS).

The model used in this study mirrors the work of Shabir, Naeem and Ihtsham (2015) on the impact of terrorism on Northern Pakistan's economic growth. The model is specified as:

$$Y_t = \alpha + \beta_1 POP_t + \beta_2 CAP_t + \beta_3 HCA_t + \beta_4 DOP + \beta_5 FAS + \beta_6 TER \dots \dots \dots (1)$$

Where:

Y_t = Per capita GDP and is used as dependent variable.

α = intercept

POP = population growth rate,

CAP = Gross capital formation

HCA = human capital

DOP = Degree of Openness

FAS = Foreign Assistance;

TER = terrorism (proxy by terrorism index); and

$\beta_1 - \beta_6$ are the coefficients of respective variables.

Model (1) above is modified by replacing gross capital formation (CAP), human capital (HCA), degree of openness (DOP), and foreign Assistance (FAS) with number of people killed through terrorist attacks. Thus, the model for this study is specified as:

$$Y_t = f(POP, DET, TER, \dots \dots \dots) \dots \dots \dots (2)$$

Where, DET is the number of people killed in the North-Central Nigeria through terrorist attacks. The linear form of the model is:

$$Y_t = \alpha + \beta_1 POP_t + \beta_2 DET + \beta_3 TER + U \dots \dots \dots (3)$$

Where, U = Error term. The a priori expectations are that: $\beta_1 > 0$, $\beta_2 < 0$, and $\beta_3 < 0$.

Model (3) was estimated by using autoregressive distributed lag (ARDL) techniques. Before estimation, the study determined whether the variables are stationary or not. This was used to determine the underlying properties of process that generate our time series data. In addition, the Augment Dickey-Fuller (ADF) t-test was used to determine the order of integration. If the Results reveal that all the variables are non-stationary at level so the null hypothesis of unit root at level cannot be rejected. To carry out co-integration test, we employ Johansen co-integration technique. Using this technique, the null hypothesis of no co-integration is rejected if the calculated value is greater than the tabular value (at a chosen relevant significance level), or otherwise.

To avoid the possibility of estimating spurious relationships in the presence of some nonstationary variables, estimation is performed using error correction model (ECM) procedure. This test is carried out only if the variables are co-integrated (meaning that they are most likely to converge in the long run). To achieve this, we employ the Engle-Granger method, which required that the error correction factor whose coefficient should be negative and statistically significant to support the presence of long run trend analysis. The negative value of the error correction factor means that any short-run disequilibrium can be adjusted to equilibrium in the long-run. The magnitude of the error correction factor shows the speed of adjustment.

The choice of the ARDL is based on the following reasons: (i) the model can be applied irrespective of whether the series under investigation are stationary at I(0) or I(1) or mixture of both. (ii) It provides robust and high-quality result even if sample size is small or large. (iii) It takes into account the error correction model. The analysis of error correction and autoregressive lags fully covers both long-run and short-run relationships of the variable under study.

Empirical Results and Analysis

The results are summarized in tables below.

Table 1: Normalized cointegrating coefficients

Series	ADF Test Stat.	5%	Order of Co-integration
GDP	-3.743018	-2.924867	I(1)
POP	-3.839139	-2.924867	I(1)
DET	-5.975421	-2.924867	I(1)
TER	-5.340183	-2.924867	I(1)

Source: Author's computation, 2022 using E-views 10.0 version

The results of unit root test shown on table 1 above revealed that all the value of ADF test statistics for variable is negative. They are respectively greater than their critical values at 5%,

implying that the variables are stationary at 5%. They are also integrated at first difference, that is, $I(1)$.

Since all the variables were found to be integrated of order 1, that is, $I(1)$ and stationary at 5%, the study can now perform cointegration test. The results of cointegration test are presented in table 2 below.

Table 2: Johansen Cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.805880	197.9842	159.5297	0.0001
At most 1 *	0.733805	138.9701	125.6154	0.0059
At most 2	0.547225	91.32326	95.75366	0.0971
At most 3	0.510614	62.79829	69.81889	0.1597

Source: Author's computation, 2022 using E-views 10.0 version

The results on table 2 above showed that the Eigen value is less than 5% critical value at all levels (compare column 2 and column 4). It can also be observed that there are two unique cointegration equations between gross domestic product (GDP), population growth rate (POP), number of people killed in terrorist attacks in North-Central Nigeria (DET), and terrorism index (TER) in Nigeria. Since there is at least one cointegrating equation found in the model, the study concludes that significant long-run relationship exists among the variables. Also, since all the variables were found to be stationary and cointegrated, the study can now present and analyze the autoregressive distributed lag results. The results of autoregressive distributed lag are presented on table 3 below.

Table 3: Regression Results of Autoregressive Distributed Lag Model

Variable	Coefficient	Std. Errors	t-statistics	5% critical value	Prob
C	0.038337	0.036630	1.046598	2.07	0.3049
POP (-1)	0.479788	0.053840	0.420234	2.07	0.0693
DET (-1)	-0.023520	6.14244	-2.436847	2.07	0.0058
TER (-1)	-0.229893	0.061925	3.712456	2.07	0.0010
ECM(-1)	-0.848496	0.239250	-3.546480	2.07	0.0015
R-square = 0.690803		Mean dependent Var. = 0.191475			
R-square (adjusted) = 0.583773		S.D dependent Var. = 0.117875			
S.E of equation = 0.076048		Akaike Info. Criterion = -2.084773			
Sum square residual = 0.150365		Scharz Criterion = -1.644906			
Log likelihood = 47.52591		F-statistics = 6.454298			
Durbin-Watson stat = 2.209920					

Dependent Variable: GDP

Method: Least Squares

Sample: 2009-2021

Source: Author's computation, 2022 using E-views 10.0 version

The results on table 3 above reveal the following. It was found that coefficient of population growth rate (POP) is positive), indicating positive relationship between population growth rate and gross domestic product in North-Central Nigeria, and this is in line with a priori expectation. Besides, the probability value (0.0693) is greater than 0.05. Thus, we accept the null hypothesis (H_0) and conclude that population growth rate (POP) has positive and insignificant effects on gross domestic product in North-Central Nigeria during the period under study. The finding implies that gross domestic product increases as population growth rate rises. This means that population growth rate is not significant in determining gross domestic product (economic growth) in North-Central Nigeria.

The reason is that positive population growth rate has added labour force and hence it is an injection into gross domestic product, and hence rise in its value will lead to increase in gross domestic product in the zone. The positive and weak impact of population growth rate on economic growth in North-Central Nigeria could be attributed to the fact that not all additional population have been gainfully employed in the zone.

The coefficient of number of people killed in terrorist attacks in North-Central Nigeria (DET) is negative, indicating negative relationship between it and gross domestic product (GDP) in North-Central Nigeria, and this is in line with a priori expectation. Also, the probability value (0.0058) is less than 0.05, meaning it is significant at the 5% level. The finding implies that gross domestic product increases as number of people killed in terrorist attacks in North-Central Nigeria (DET) decreases. Thus, the null hypothesis of no positive and significant effects of number of people killed in terrorist attacks in North-Central Nigeria (DET) on economic growth should be rejected. This means that number of people killed in terrorist attacks in North-Central Nigeria is significant in determining gross domestic product (economic growth) in the zone.

The coefficient of terrorism index (TER) is negative, indicating negative relationship between terrorism index and gross domestic product (GDP) in North-Central Nigeria, and this is in line with a priori expectation. Besides, the probability value (0.0010) is less than 0.05, meaning it is significant at the 5% level. Thus, the null hypothesis of no significant effect of foreign exchange rate on economic growth should be rejected. The results from the present study revealed that terrorism index has negative and significant impact in determining gross domestic product North-Central Nigeria.

Conclusion and Recommendations

From the analysis of the results, it can be stated that while population growth rate (POP) has positive effect on gross domestic product, number of people killed in terrorist attacks in North-Central Nigeria (DET), and terrorism index (TER), have negative impact on gross domestic product in North-Central Nigeria. Therefore, terrorism generally has negative impact on economic growth in North-Central Nigeria.

The policy solutions for the terrorism plaguing the North-Central states of Nigeria must be multipronged and include:

Systematic checks on Nigerian external borders on all people entering Nigeria-including Nigerian citizens – should be introduced. Governments of states in the North-Central zone, should as a matter of urgency and importance, promote dialogue and co-operation on counter-terrorism issues, in particular, through public-private partnerships between the states authorities and the private sector (business community, industry), as well as civil society and the media. The states should also strengthen national efforts to implement United Nations Security Council resolution 1540 (2004) on non-proliferation of weapons of mass destruction. This will assist in reducing loss of human lives towards increasing population growth rate.

Establishment of Security Trust Fund. Government of Nigeria should establish Security Trust Fund (ETF) to directly fund security in the country. To achieve this, private firms should be force to contribute certain part of their gross profits to the fund. This can contribute to remedying the terrorism situation as it serves as a channel where armed forces and other security personnel who died in services to the nation can be compensated. This will encourage the security personnel in the battle against terrorism in the country.

Better supported border security and fight against corruption. The federal government must collaborate with state governments (in the North-Central Nigeria) to address the immediate challenge of border porosity. Concerted efforts to recruit, train, and post adequately equipped customs and immigration personnel to the region can boost surveillance and stem the tide of the free flow of arms into the country. Moreover, addressing corruption here is pivotal, because border patrol is a major racket for security forces and government officials. The ongoing military response must also be sustained through strategic coordination with the counterterrorism unit of the Nigerian police force, while the recent introduction of drone surveillance and anti-banditry bombardment should be maintained.

Improved law enforcement. Federal government must prioritize law enforcement solutions in tackling rising terrorism in the North-Central zone. Policing is critical to intelligence gathering in identifying and tracking the cells of criminal groups in the states and aiding community response to insecurity.

Collaboration with neighbors. Another effort toward border security is the creation of a bilateral joint task force between North-Central zone and other zones to serve as a trans-border security force resourced and managed through the immigration and custom services in the respective states. The joint task force should be matched with immediate and precise action to prevent wide-scale terrorist and bandit movements across the states.

Strategic investments in human and infrastructural development. Such investments can work to solve the long-term, underlying challenges created by poor governance and deepening poverty that might have caused terrorism.

Concerted local engagement. The federal and state governments must collaborate with the established religious and traditional institutions as well as vigilante group to build community resilience against terrorism.

Governments of states in the North-Central Nigeria should create avenues to resolve conflicts among any conflicting parties before it degenerates into crisis. Also, governments should ensure effective use of resources like power, military, land reforms, finance, external alliances and hierarchical structure of organization to counter-terrorists. Lastly, there must be strict enforcement of law against any act of terrorism in the zone.

Employment of Youths. To this end, concerted efforts by the government of Nigeria, and indeed the states in the North-Central zone, in curbing the menace of terrorists would be a welcome development. It is expected that the state governments and other stakeholders including non-governmental organizations should provide employment opportunity for the young unemployed youth to be engaged in meaningful work so as to prevent them from being instrument of terrorist attacks.

Promoting inclusive growth in North-Central Nigeria through the development of economic sectors which are labor-intensive such as the agricultural sector and small-scale businesses could aid the reduction in terrorism in the region. Furthermore, leaders in North-Central Nigeria should endeavor to improve political stability. There should be improvements in accountability, rule of law, and tribal demarginalization, and nepotism should be abated in North-Central Nigeria. There is a need for the development of human capital, in particular, priority should be placed on quality education, improving inclusive human development to discourage individuals from engaging in the act of terror considering the opportunity cost of terrorism. Finally, it is necessary for the states in North-Central region to reflect on curbing terrorism through poverty-reducing policies, unemployment-reducing policies, inclusive economic growth, and political stability.

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