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Terrorism in Nigeria: A Dynamic Time Series Framework

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Abstract
This study examines the effect of economic, social, political, demographic, geographic and environmental factors on domestic terrorism in Nigeria between1970 and 2012. Estimates, based on the boundstesting procedure to cointegration within an autoregressive distributed lag(ARDL) framework and error correction specification, indicate that LOG(HDI), LOG(GINI), POLS, TERR(-1), DLOG(POPG), DLOG(OEXP(-1)) and DLOG(OEXP) have a positive impact on terrorism in the short run. On the other hand, LOG(GOVX), LOG(POPG), DLOG(GINI(-1)) and LOG(INFL) have a negative relationship with terrorism. The long run static relationship shows that LOG(HDI), POLS and LOG(UBAN) positive impact on terrorism while LOG(INFL), LOG(GDPC) and LOG(GOVX) exhibit inverse relationship with terrorism. The results further show that, the error correction mechanism (ECM) indicates that a deviation from the long-run equilibrium following a short-run shock is corrected by about 41 per cent after each year.
Key words: Terrorism, Autoregressive Distributed Lag Model.

1. Introduction

In recent times, terrorism has become one of the most dangerous threats to peace and order nationally and globally. It is so pervasive that no country on earth can claim immunity from its violent acts of bombing, shooting, armed robbery, kidnapping, hostage-taking and bank robbery (Ogbeide, 2011). It is a common knowledge that Nigeria since her return to civil rule in 1999 faces some national security challenges across the six geo-political zones in the country. The spate of bomb blasts, kidnapping, pipeline vandalisation and other forms of criminalities in recent times in various parts of the country are emerging trends of domestic terrorism (Abimbola and Adesote, 2012). The major thrust of this paper is to econometrically investigate the root causes of domestic terrorism in Nigeria. The essence of this country specific study is because important specific features of developing countries like Nigeria are often not taken into account in cross-country regressions, which in turn have proven to be rather poor predictors of terrorism. Understanding the causes of terrorism at country level will help to frame a comprehensive counterterrorism strategy. The rest of the paper is structured as follows. Section ii presents the literature review while section iii gives some facts and figures of terrorism and economic performance of Nigeria. Section iv is devoted to the analytical method of the paper. The results of the empirical analysis are reported in Section v. Section vi summarizes the main conclusions of the paper with some policy observations.

2. Literature Review

Political scientists have long emphasized that terrorism has been a constant source of worldwide tension through much of the post World War II era, and indeed the very origin of the term points to a long history, dating back to the late 1700s (Blomberg, Hess, and Orpanides, 2004).However, "there exists no single root cause of terrorism, or even a common set of causes". Similarly, there exists no single definition of terrorism as such. The US State Department has been since 1983 using this definition: "The term 'terrorism means premeditated, politically motivated violence perpetrated against non-combatant targets by sub-national groups or clandestine agents, usually intended to influence an audience". To differentiate international terrorism they add "the term 'international terrorism' means terrorism involving citizens or the territory of more than one country" (Godovicova, 2012).

Root causes are those features that "set the stage for terrorism in the long run". Marta Crenshaw suggested a scheme of cause of terrorism dividing it into different categories. There is a category of precipitants – factors that immediately provoke occurrence of terrorism and then a category of preconditions – those features, that in the long-term create an environment where the inclination towards terrorism is likely to occur(Godovicova, 2012).

The bulk of empirical studies trying to reveal the root causes of terrorism employs cross country data, mainly focusing on transnational terrorism, recognizing its dyadic nature with respect to the sources and targets of transnational terrorism (Blomberg and Rosendorff, 2006; Blomberg and Hess, 2008; Azam and Delacroix, 2006; Lai, 2007; and Azam and Thelen, 2008; Piazza, 2008). Moreover country specific studies, using micro level data, try to investigate the country- or region-dependent terrorism dynamics (Krueger and Maleckova, 2003; Berrebi, 2007 and Feridun and Sezgin, 2008).Empirical studies investigating the root causes of terrorist incidents generally employtraditional cross sectional analysis, implicitly assuming the same economic, social and political environments for countries under consideration. This is a highly restrictive assumption and may result in

heterogeneity bias. Resorting to country studies rather than cross-country analysis may overcome such a heterogeneity bias (Yildirim, J., Öcal, N, and Korucu, N. (n.d.)).

To understand the country-level determinants of domestic terrorism, it is important to look primarily within countries, and analyze how characteristics of the environment, that is, structural factors at the national and local level, affect the emergence of domestic terrorism (Polo,2012). There are two fundamental ways in which structural factors may affect the likelihood of terrorism: they can influence terrorist groups' motives or simply provide opportunities for terrorist actions. Accordingly, the country-level determinants of domestic terrorism can be divided into direct causes and permissive or enabling conditions, which will be referred to also as demand-side and supply-side factors(Polo,2012). More specifically, direct causes or demand-side factors refer to grievances stemming from political, social and economic conditions which "directly inspire and motivate terrorist activity" (Crenshaw, 1981; Drakos and Gofas, 2006). Supply-side or permissive factors refer to conditions which "provide opportunities for terrorism to occur" (Crenshaw, 1981; Drakos and Gofas, 2006) in that they affect terrorists' strategic calculations by either maximizing the expected return or minimizing the costs of action.

In quantitative terrorism analysis, one of the most popular method ofestimation is the Ordinary Least Square (OLS). OLS is a static analysis, thus it relies heavily on the basicassumptions in the Classical Linear Regression Model (CLRM), especially theassumptions related to the error term. Any violation of the assumptions would result ininvalid regression estimation(Salleh et al, 2008).In order to overcome this problem, the data used in regression analysis shouldbe stationary. If the data are stationary, then the error term should meet all the basicrequirements under the CLRM assumptions. However, most time series dataare non-stationary, and the issue of stationarity has been ignored by many researchers. Estimation based on non-stationary data is flawed (Philips,1986). This can lead to a serious problem of spurious regression (Morley, 1998; Songand Witt, 2006). The consequence for ignoring data stationarity is that the estimatedparameters are unreliable and the t-tests and F-tests produce misleading results(Salleh et al, 2008).In some cases, in order to make the data stationary, differenced variables areused in regression analysis. In other words, the Cochrane-orcutt (CO) procedures areapplied, especially when there is a presence of autocorrelation (Uysal and Crompton,1984; Hollender, 1982; Loeb, 1982; Martin and Witt, 1987). This will leadto another serious problem with the traditional tourism model which is related to theforecasting performance. Differenced variables generate only the short-run estimation.

To overcome the problem of taking the long-run relationship among the variables into account, the modern econometric methodologies areemployed. After the mid-1990's, mostresearchers apply the dynamic analysis since the static analysis suffers from theproblem of spurious regression(Salleh et al, 2008). Furthermore, the static analysis is associated withstructural and forecasting problems (Song and Witt, 2000).One of the most popular dynamic methodologies atpresent is the cointegration method. Cointegration shows the long-run equilibriumrelationship while accommodating the dynamic short-run relationship. Cointegrationanalysis requires the use of stationary data. Therefore, the regression is free fromspurious results(Salleh et al, 2008). There are a few approaches of cointegration analysis including AutoregressiveDistributed Lag (ARDL). In this paper, the boundstesting procedure to cointegration within an autoregressive distributed lag(ARDL) frameworkis used and the country of focus is Nigeria.

3. Terrorism and Nigeria's Economy: Facts and Figures

Nigeria is located in western Africa on the Gulf of Guinea and has a total area of 923,768 km^2 (356,669 sq mi)(World Factbook, n.d.), making it the world's 32nd-largest country (after Tanzania). It is comparable in size to Venezuela, and is about twice the size of California. It shares a 4,047 kilometres (2,515 mi) border with Benin (773 km), Niger (1497 km), Chad (87 km), Cameroon (1690 km), and has a coastline of at least 853 km(World Factbook, 2011).Nigeria lies between latitudes 4° and 14°N, and longitudes 2° and 15°E(Wikipedia, 2013). See Figure 1 in Appendix for map of Nigeria exhibiting its 36 states and the federal capital territory.

The country is classified as a mixed economyemerging market, and has already reached middle income status according to the World Bank(2011), with its abundant supply of natural resources, well-developed financial, legal, communications, transport sectors and stock exchange (the Nigerian Stock Exchange), which is the second largest in Africa. Nigeria is ranked 31st in the world in terms of GDP (PPP) as of 2011(Wikipedia, 2013). Nigeria is the United States' largest trading partner in sub-Saharan Africa and supplies a fifth of its oil (11% of oil imports). It has the seventh-largest trade surplus with the U.S. of any country worldwide. Nigeria is the 50th-largest export market for U.S. goods and the 14th-largest exporter of goods to the U.S. The United States is the country's largest foreign investor(State.gov, 2008).The International Monetary Fund (IMF) projected economic growth of 9% in 2008 and 8.3% in 2009(IMF, n.d.; Aminu, n.d.; Godwin, n.d.).The IMF further projects a 8% growth in the Nigerian economy in 2011(Odueme, 2011).February 2011: According to Citigroup, Nigeria will get the highest average GDP growth in the world between 2010–2050. Nigeria is one of

two countries from Africa among 11 Global Growth Generators countries(Businessinsider.com, 2011).

The contemporary Nigeria has become a theatre of genocide, bloodshed and insecurity over the past three years due to the carnage activities of terrorist groups. Terrorists of various groups and camps unleash havoc on the Nigerian populace. Though these groups are numerous, the most noticeable and deadly are the Boko Haram sect and Niger Delta Militants (Zumve,Ingyoroko andAkuva, 2013). See Table 1in Appendix for the characteristics of religious and ethnic-nationalist militant organizations in Nigeria.

Boko Haram (Hausa:Lit "Western education is sinful"), is a jihadist militant organization based in the North-East Nigeria. It is an Islamist movement which strongly opposes man-made laws and modern science. Founded by Mohamed Yusuf in 2001, the organization seeks to establish sharia law in the country. The group is also known for attacking Christians and bombing churches. Ideologically, Boko Haram proposes that interaction with the Western world is forbidden, and also advocates the establishment of a Muslim state of Nigeria. Basically, Boko Haram strongly opposed anything Western, which it sees as corrupting Muslims. Even though the greater percentage of Boko Haram attacks victims are Christians, the group equally kills Muslims who criticize it(Zumve et al, 2013). The group linked the level of poverty in the country especially in the North, its stronghold, to corruption. Corruption to the Boko Haramists is considered a Western value and legacy. The group (Boko Haram) at the onset appeared to have had its operational bases located in the poorest parts of Northern Nigeria. It is in such places where people who have been denied opportunity to go to school and meaningful economic sources of livelihood are making recruitment easier(Zumve et al, 2013).

Poor governance and corruption have provided a rallying cry for Boko Haram.There is a colony of *lumpen proletariat* majority of whom are not in regular employment who gain their subsistence mainly from crime. These colonies of destitute who are desolate become major reservoir of foot soldiers for the Boko Haram sect. The grunts that blow themselves up along with innocents around them are drawn from this pool of poor underclass, idle youths with few prospects for employment. Significantly, the North-west and Northeast recorded the highest poverty rates in the country in 2010, with 77.7% and 76.3% respectively (Awoyemi, 2012).

The Niger Delta, the main center of Nigeria's economy, is the stronghold of terrorist gangs that carry out kidnapping, hostage taking and hijacking. Until October, 2010, the movement for the Emancipation of the Niger Delta (MEND) confined its horrendous terrorist activities of kidnapping, hostage taking and hijacking in the Niger Delta region. In fact, MEND's stated goals are to localize control of Nigeria's oil and secure reparations from the Federal Government for pollution caused by the oil industry. Basically MEND was conceived and operated with the focus of "Total control" of the Niger Delta oil wealth. The area referred to as the Niger Delta region was limited to the geopolitical zone occupied mainly by the minorities of Southern Nigeria, which currently comprises the six states of AkwaIbom, Bayelsa, Cross River, Delta, Edo and Rivers. In recent years, the region was politically redefined and enlarged to include all the nine contiguous oil-producing states which incorporates new sates such as Abia, Imo, and Ondo (Akpan,2010). It is disheartening to note that the people in this geographical zone, just like other parts of Nigeria continue to live in pristine conditions and in most cases without electricity, pipe borne water, hospital, housing and schools in spite of the enormous wealth the government derives from this region.

It is the state neglect of people in this region that set the stage for violent terrorist acts of kidnapping, hostage taking and hijacking (see Table 2 in Appendix for police record of some cases of kidnapping and piracy in the Niger-Delta). The Niger Delta Region (NDR) is characterized by widespread poverty. About 70% of the population live below the poverty line, this might have increased in recent years when so many graduates have been turned out without jobs. The pervasive poverty is due largely to the low level of industrialization. This has been made more difficult by the activities of Transnational Corporations TNCS, which have adversely affected the traditional economy of subsistence fishing and farming. The modern transport infrastructure is inadequate and often hampered by a poor road network and harsh conditions especially in the coastal areas. Health care is less than desirable while the schools are ill-equipped; hence they serve more as youth restive factories than institutions of learning. These harsh conditions provide a fertile ground for social unrest, conflict and instability (cited in Zumve, Ingyoroko and Akuva, 2013). See Table 3 for cases of domestic terrorism arising from bomb explosions in Nigeria between 1986 and 2012.

4. Analytical Methodology

In addition to the descriptive approach in the preceding section, the paper now adopts an econometric approach in its empirical analysis of terrorism in Nigeria. Dummy variableshave been included in the model to take account of factors that are non-quantitative in nature or no data available. It is believed that such factors can have a very significant impact on terrorism occurrence. In regression models, a dummy variable takes the value '1' in the year of an event and '0' otherwise. It is not practical to try and include many dummy variables particularly from a statistical point of view where each additional variable results in the loss of a degree of freedom from the regression. For the purposes of this paper, two dummy variables were incorporated: terrorism occurrence and political instability.

There are other factors hypothesised to affect terrorism occcurrence but which have been omitted from estimation in this study. The inclusion or exclusion of certain other variables from the study means that the subsequent results are subject to biases entailed in mis-specification and omitted variables, particularly, if the variable excluded is correlated with the dependent variable. Essentially, it would prove impractical to attempt to include all possible variables in a regression model. Nonetheless, certain variables are excluded purely on grounds of inadequate data. Indeed, loss of degrees of freedom means that only the most important variables remain.

The data used for this study are basically time series covering forty-two (42) years periodand the need for stationarity testing (Augmented Dickey Fuller (ADF) or Phillips-Perron Tests) and other similar tests is obviated.This paper uses the co-integration and error correction methods to analyze terrorism occurrence in Nigeria. The framework for the study has its basis on the bounds testing procedure to cointegration within an autoregressive distributed lag (ARDL).

The main advantage of this method is that it yields valid results irrespective of whether the underlying variables are I(0), I(1), or a combination of both (Jalil et al., 2010). The method is also asymptotically efficient in small sample study and when the regressors are endogenous (Sakyi, 2011). This is appropriate for this particular paper with only 42 observations and the possibility that the explanatory variables may be plagued by the endogeneity problem.

4.1 Specification of Model

In this paper, the following function is proposed to model the causes of terrorism in Nigeria:Terrorism = f(economic, social, political, demographic, geographic, environmental)*...(1)*

One major feature of equation 1 is that it can be transformed into a log-linear specification, whichcan be estimated easily using the ordinary least squares (OLS) method. After taking logarithms of Equation (1) and substituting specific measures for generic categories, we have:

Terrorism = $\aleph$+ln$\eth$(GDP per capita, human development index, inequality of income) + lnΨ(poverty level/unemployment rate) + ln$\check{Z}$(political stability) +ln$\ddot{I}$(population growth) +ln$\check{a}$(mineral resources) + lnχ(urbanization)+ ϕ .....(2)

Where $\aleph$ is a constant term, $\eth$, Ψ, $\check{Z}$, $\ddot{I}$, $\check{a}$, χ are coefficients that will be estimated empirically.ϕ is the residual term and it is used to capture the influence of all other factors that are notincluded in the model. Residual term is important since terrorism is influenced by many factors and most of them could not be included because of data unavailability. The signs of the respective economic coefficients are expected to be negative, likewise is the geographic variable coefficients. The expected sign of the coefficients of social variables is positive. So also are the coefficients of political, demographic, and environmental variables expected to be positive.

The data covers the period from 1970 to 2012. All the variables are taken on annual basis from various issues of the Central Bank of Nigeria (CBN) Statistical Bulletin.This period has recorded casualties in terms of life and property.

4.2. Tests of Stationarity

To investigate the data univariate properties and to determine the degree to which they are integrated, both the augmented Dickey-Fuller (ADF) (1979) and Phillips-Perron (PP) (1988) unit-roots tests have been employed. Augmented Dickey-Fuller test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favor of the alternative hypotheses of stationarity.On the other hand, the Phillips-Perron test differs because it is a robust test for serial correlation and time dependent heteroskedasticities. However, the general form of ADF test is estimated by the following regression:

$$\Delta Z_t = \eta_0 + \eta_1 Z_{t-1} + \sum_{i=1}^{n} \pi_1 \Delta Z_{t-i} + V_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

$$\Delta Z_t = \eta_0 + \eta_1 Z_{t-1} + \eta_1 t + \sum_{i=1}^{n} \pi_1 \Delta Z_{t-i} + V_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(4)$$

The time series variable is represented by Z, t andV_t, as time and residual respectively. Equations(3) and (4) are the test models with intercept only, and linear trend respectively.

4.3. Error Correction Model

A good time series modeling should describe both short-run dynamics andthe long-run equilibrium simultaneously. For this purpose an error correction model (ECM) must be developed.For example,let the error correction term be defined by$\varepsilon_t = y_t - \beta x_{t-1}$where$\beta$ is a cointegrating coefficient. In fact, ε_t is the error from a regression of y_t on x_t. Then an ECM is simply defined as :

$$\Delta y_t = \alpha \varepsilon_{t-1} + \gamma \Delta x_t + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

The ECM equation (5) simply says that Δy_tcan be explained by the lagged $\varepsilon_{t-1}$and Δx_t . Notice that ε_{t-1} can be thought of as an equilibrium error (or disequilibrium term) occurred in the previous period. If it is non-zero, the model is out of equilibrium and vice versa.

4.4. Cointegration: ARDL (Autoregressive Distributed lag model) Bound Test

There are several methods to conduct cointegration test. The two most widely used methods are the residual based Engle-Granger (1987) test base on the system of equation using vector autoregressive (VAR) models suggested by Johansen (1988, 1991) and Johansen and Juselius (1990, 1992). A Vector Autoregressive (VAR) approach is used to model each variable as a function of all the lagged endogenous variables in the system. Johansen (1988) considers a simple case where Y_t is integrated of order one, such that the first difference of Y_t is stationary.

Given that sometime not allvariables are integrated of the same order, the testing and estimation procedure advanced in Pesaran et al (2001) and Pesaran and Shin (1997) is employed to examine the existence of a long-term relationship (cointegration) in this analysis namely the ARDL bound approach. Unlike other cointegration approaches such as the Johansen's (1988) Maximum Likelihood technique, the ARDL technique does not require the variables in the model to be I(1), or of the same order. The appealing aspect of the ARDL approach is that a long-run relationship can be established without pre-testing the respective time series for unit roots, which is useful given a relatively low power of unit root tests.The approach also allows us to incorporate some dynamics in the analysis.

The ARDL approach requires two steps. In the first step, the existence of any long run relationship among the variables of interest is determined by using the F-test. The second stage requires the estimation of the long run relationship and to determine their values, thereafter the short run elasticity of the variables with the error correction representation of the ARDL model. One of the advantages of using the error correction is that it provides a way of combining both the short-run (changes) and the long-run (levels) adjustment process simultaneously. Therefore, applying the ECM version of the ARDL is to determine the speed of adjustment to equilibrium. Also, ECMs can avoid the occurrence of spurious regression and multicollinearity problems. A correctly indicated ECM model has to pass a series of diagnosed tests. These include the Breusch-Godfrey LM (Lagrange multiplier) test and/or Durbin-Watson test for serial correlation in the residual, the JarqueBera LM test for normality distribution of the residuals in a regression model, the ARCH, the White test for heteroscedasticity in errors, the Chow test for predictive failure, and the CUSUM (Cumulative sum) test for structural stability.

For equation 2 above, the error correction versions of the ARDL model in the variablesterrorism (TERR), GDP per capita (GDPC), human development index (HDI), inequality of income (GINI), inflation (INFL), poverty level (POVL), political stability (POLS),government expenditure (GOVX), population growth rate (POPG), mineral resources (OEXP), and urbanization (UBAN)is given respectively by:

$$\Delta TERR = \beta_0 + \sum_{i=1}^{n}\beta_1\Delta TERR_{t-1} + \sum_{i=1}^{n}\beta_2\Delta GDPC_{t-1} + \sum_{i=1}^{n}\beta_3\Delta HDI_{t-1} + \sum_{i=1}^{n}\beta_4\Delta GINI_{t-1} + \sum_{i=1}^{n}\beta_5\Delta INFL_{t-1} + \sum_{i=1}^{n}\beta_6\Delta POVL_{t-1} + \sum_{i=1}^{n}\beta_7 POLS_{t-1} + \sum_{i=1}^{n}\beta_8\Delta GOVX_{t-1} +$$

$$\sum_{i=1}^{n}\beta_9\Delta POPG_{t-1} + \sum_{i=1}^{n}\beta_{10}\Delta OEXP_{t-1} + \sum_{i=1}^{n}\beta_{11}\Delta UBAN_{t-1} + \delta_1 TERR_{t-1} + \delta_2\Delta GDPC_{t-1} + \delta_3\Delta HDI_{t-1} + \delta_4\Delta GINI_{t-1} + \delta_5\Delta INFL_{t-1} + \delta_6\Delta POVL_{t-1} +$$

$$\delta_7 POLS_{t-1} + \delta_8\Delta GOVX_{t-1} + \sum\beta_9\Delta POPG_{t-1} + \delta_{10}\Delta OEXP_{t-1} + \delta_{11}\Delta UBAN_{t-1} + Ж$$

whereβ_1 … β_{11} are the short run dynamic coefficients of the ARDL model; δ_1 … δ_{11} are the long run multipliers; Δ is the first -difference operator;n is the optimal lag length. TERR and POLS are dummies, therefore, they are not differenced or logged.

For the model, the hypothesis that is being tested is the null of 'non-existence of the long run relationship' defined by:$H_0 : \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = \delta_7 = \delta_8 = \delta_9 = \delta_{10} = \delta_{11} = 0$and the alternative hypothesis is$H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq \delta_6 \neq \delta_7 \neq \delta_8 \neq \delta_9 \neq \delta_{10} \neq \delta_{11} = 0$.The F-test is used to test the existence of long run relationship. When long run relationship exists, F- test indicates which variable should be normalized. It should be noted that the distribution of the F statistic is non-standard, irrespective whether regressors are I(0) or I(1). Pesaran and al (1997) have tabulated the appropriate critical values for different number of regressors and whether the regressors contain an intercept or a time trend. If the F-test statistics exceeds their respective upper critical values, we can conclude that there is evidence of a longrun relationship between the variables regardless of the order of integration of the variables. If the F-test statistics is belowthe upper critical value, we cannot reject the null hypothesis of no co-integration and if it lies between the bounds, aconclusive influence cannot be made without knowing the order of integration of the underlying variables.

If there is evidence of long run relationship (co-integration) of the variables, the following long run model is estimated:

$$TERR = \beta_0 + \sum_{i=1}^{n}\beta_1 TERR_{t-1} + \sum_{i=1}^{n}\beta_2\Delta GDPC_{t-1} + \sum_{i=1}^{n}\beta_3\Delta HDI_{t-1} + \sum_{i=1}^{n}\beta_4\Delta GINI_{t-1} + \sum_{i=1}^{n}\beta_5\Delta INFL_{t-1} + \sum_{i=1}^{n}\beta_6\Delta POVL_{t-1} + \sum_{i=1}^{n}\beta_7 POLS_{t-1} + \sum\beta_8\Delta GOVX_{t-1} +$$

$$\sum_{i=1}^{n}\beta_9\Delta POPG_{t-1} + \sum_{i=1}^{n}\beta_{10}\Delta OEXP_{t-1} + \sum_{i=1}^{n}\beta_{11}\Delta UBAN_{t-1} + Ж$$

The ARDL specification of the short run dynamics can be derived by constructing an error correction model (ECM) of the following form:

$$TERR = \beta_1 + \sum_{i=1}^{n}\beta_2 TERR_{t-1} + \sum_{i=1}^{n}\beta_3 \Delta GDPC_{t-1} + \sum_{i=1}^{n}\beta_4 \Delta HDI_{t-1} + \sum_{i=1}^{n}\beta_5 \Delta GINI_{t-1} + \sum_{i=1}^{n}\beta_6 \Delta INFL_{t-1} + \sum_{i=1}^{n}\beta_7 \Delta POVL_{t-1} + \sum_{i=1}^{n}\beta_8 POLS_{t-1} + \sum_{i=1}^{n}\beta_9 \Delta GOVX_{t-1} +$$

$$\sum_{i=1}^{n}\beta_{10} \Delta POPG_{t-1} + \sum_{i=1}^{n}\beta_{11} \Delta OEXP_{t-1} + \sum_{i=1}^{n}\beta_{12} \Delta UBAN_{t-1} + \ddot{\varphi} ECM_{t-1} + Ж$$

where β_1 .... $\beta_{12}$are the short-run dynamic elasticities of the model's convergence to long-run equilibrium and $\ddot{\varphi}$ is the speed of adjustment. D represents first difference operated and ECMt-1 is the one period lagged error correction term. The coefficient measures the speed of adjustment to obtain equilibrium in the event of shocks to the system. The error term is defined as:

$$ECM_t = TERR - \beta_0 - \sum_{i=1}^{n}\beta_1 TERR_{t-1} - \sum_{i=1}^{n}\beta_2 \Delta GDPC_{t-1} - \sum_{i=1}^{n}\beta_3 \Delta HDI_{t-1} - \sum_{i=1}^{n}\beta_4 \Delta GINI_{t-1} - \sum_{i=1}^{n}\beta_5 \Delta INFL_{t-1} - \sum_{i=1}^{n}\beta_6 \Delta POVL_{t-1} - \sum_{i=1}^{n}\beta_7 POLS_{t-1}$$

$$- \sum_{i=1}^{n}\beta_8 \Delta GOVX_{t-1} - \sum_{i=1}^{n}\beta_9 \Delta POPG_{t-1} - \sum_{i=1}^{n}\beta_{10} \Delta OEXP_{t-1} - \sum_{i=1}^{n}\beta_{11} \Delta UBAN_{t-1}$$

4.5. Limitations

The most natural measure of terrorism is something that reflects the frequency of attacks – e.g., the number of terrorist attacks, the number of casualties, or some index of these measures (e.g., the index used by Eckstein and Tsiddon, 2004). Due to unavailability of data, a dummy variable was constructed. Unfortunately, the use of a dummy to measure the occurrence of terrorism in a given year loses a lot of useful information. Other factors that may influence terrorism can be extent of civil liberties, linguistic fractionalization, cultural, ethnic and religious differences. However, none of these factors have been included in this paper since the data on these factors are either unavailable or difficult to measure.

5. The Results of the Research

5.1. Unit-Root Tests Results

Concerning the unit roots, results of both the ADF and PP tests are reported in Table 1 and 2 (see Appendix). The result in Table 6.1 shows that besides human development index (HDI) and poverty level (POVL), all the other variables were not stationary at levels. This can be seen by comparing the observed values (in absolute terms) of both the ADF and PP test statistics with the critical values (also in absolute terms) of the test statistics at the 1% level of significance.

Table 1.Summary results of Unit Root Tests in level form: **A**ugmented Dickey-Fuller and Phillips-Perron Tests

Variables	ADF (Intercept)	ADF (Intercept and Trend)	PP (Intercept)	PP (Intercept and Trend)
INFL	-3.502597(-3.596616)*	-3.449449 (-4.192337)*	-3.355927(-3.596616)*	-3.271319(-4.192337)*
GDPC	-2.502918(-3.596616)*	-2.594805(-4.192337)*	-2.493387(-3.596616)*	-2.581028(-4.192337)*
GOVX	0.954130(-3.596616)*	4.112767(-4.252879)*	0.539527(-3.596616)*	-1.165344(-4.192337)*
TERR	-1.840175(-3.596616)*	-1.645215(-4.192337)*	-1.834560(-3.596616)*	-1.645215(-4.192337)*
GINI	-1.758458(-3.600987)*	-1.599295(-4.198503)*	-1.519510(-3.596616)*	-1.100373(-4.192337)*
HDI	-7.825370(-3.615588)*	-2.091216(-4.192337)*	-3.552370(-3.596616)*	-1.443989(-4.192337)*
POLS	-2.282445(-3.596616)*	-3.075318(-4.192337)*	-2.232189(-3.596616)*	-3.123200(-4.192337)*
POVL	-5.720181(-3.596616)*	-6.176618(-4.192337)*	-5.728159(-3.596616)*	-6.176636(-4.192337)*
OEXP	0.551954(-3.596616)*	-0.793413(-4.192337)*	0.726336(-3.596616)*	-0.702928(-4.192337)*
UBAN	-1.419016(-3.596616)*	-3.199481(-4.192337)*	-1.440334(-3.596616)*	-3.209878(-4.192337)*
POPG	-1.672438(-3.596616)*	-2.229717(-4.192337)*	-1.725972(-3.596616)*	-2.229717(-4.192337)*

Note: * denotessignificance at 1% level. Figures within parenthesis indicate critical values.
Source:Author's Estimation using Eviews 4.0.

Since the result from Table 1 provides strong evidence of non-stationarity, hence, the null hypothesis is accepted, as such, it is sufficient to conclude that there is a presence of unit root in the variables at levels. Based on the result, all the variables were differenced once and both the ADF and PP test were conducted on them again and the results presented in Table 2. The result reveals that all the variables are stationary at first difference, on the basis of that, the null hypothesis of non-stationary is rejected and it is safe to conclude that the variables are stationary, implying that the variables are integrated of order one, i.e. 1(1).

Table 2.Summary results of Unit Root Tests in first difference :Augmented Dickey-Fuller and Phillips/Perron Tests

Variables	ADF (Intercept)	ADF (Intercept and Trend)	PP (Intercept)	PP (Intercept and Trend)
INFL	-6.330409(-3.605593)*	-6.280754(-4.205004)*	-11.48461 (-3.600987)*	-13.38827(-4.198503)*
GDPC	-3.542123(-2.945842) **	-3.390824(-3.202445) ***	-7.567119(-3.600987)*	-7.280231(-4.198503)*
GOVX	6.061500(-3.653730)*	3.152119(-4.273277)*	-4.139363(-3.600987)*	-4.152959(-3.523623)**
TERR	-6.403124(-3.600987)*	-6.492103(-4.198503)*	-6.403127(-3.600987)*	-6.508819(-4.198503)*
GINI	-4.480735(-3.600987)*	-4.541301(-4.198503)*	-4.380819(-3.600987)*	-4.311334(-4.198503)*
HDI	-5.148030(-3.610453)*	-6.548844(-4.211868)*	-7.221411(-3.600987)*	-11.60187(-4.198503)*
POLS	-7.695598(-3.600987)*	-7.597783(-4.198503)*	-7.773712(-3.600987)*	-7.671575(-4.198503)*
POVL	-7.361506(-3.605593)*	-7.267079(-4.205004)*	-37.90616(-3.600987)*	-39.04857(-4.198503)*
OEXP	-6.898364(-3.600987)*	-7.209556(-4.198503)*	-6.878397(-3.600987)*	-7.208186(-4.198503)*
UBAN	-7.181967(-3.600987)*	-7.225526(-4.198503)*	-7.238223(-3.600987)*	-7.250539(-4.198503)*
POPG	-4.915900(-3.600987)*	-4.671687(-4.198503)*	-4.915900(-3.600987)*	-4.763273(-4.198503)*

Note: * , ** and *** denotesignificance at 1%, 5% & 10% level, respectively. Figures within parenthesis indicate
critical values.
Source: Stationarity test results from analysis using Eviews 4.0.

5.2.The Results of Cointegration Test Based on ARDL Approach

The assumption of bounds testing collapses in the presence of I(2) variable. The Augmented Dickey-Fuller and Phillips-Perron Tests in Tables 1 and 2 implies that the bounds testing approach is applicable in this study, as all the variables are a mixture of I(1) or I(0).

The calculated F-statistics for the long run model and short run error correction model is presented in table 4.4. The critical values are reported in the same table and are based on critical values as reported in Pesaran et al (2001). The calculated F-statistics for the long run model is 29.29 and that of the short run model is 42.28. These values are higher than the upper and lower bound critical values at 5 per cent levels of significance. This implies that the null hypothesis of no cointegration cannot be accepted at 5 per cent and 10 per cent levels of significance and therefore, there is a long run relationship among the variables under scrutiny.Also, most of the variables have the a priori sign.

In other words, it has been proved that LOG(INFL), LOG(GDPC), LOG(GOVX), LOG(GINI), LOG(HDI), POLS, LOG(POVL), LOG(OEXP), LOG(UBAN) and LOG(POPG) are bound together in the long run (co integrated) when TERR is made the dependent variable. The results of the solved static long- run equation for terrorism (TERR) in Nigeria as well as its short run equation are given in Table 4(see Appendix).

Table 4.5:F-statistics for testing for the existence of Long Run relationship

Computed F-statistics (long run model)	29.29
Computed F-statistics error correction model	42.28
Bound Testing Critical Value	5% lower (2.365); upper (3.553

The critical values are taken from Pesaran et al (2001), unrestricted intercept and no trend with seven variables at 1 per cent is 3.027 to 4.296; at 10 per cent are 2.035 to 3.153.
Source: Stationarity test results from analysis using Eviews 4.0.

5.3.ARDL Static Long-run Results

The long run result presented in Table 5 (see Appendix) indicates that LOG(INFL), LOG(GDPC), LOG(GOVX), LOG(HDI), POLS, LOG(UBAN) aresignificant factors influencing terrorism in Nigeria. Although LOG(INFL) andLOG(HDI) do not only conformto a priori economic expectations even though they are statistically significant at 5 and 1 per cent levels ofsignificance but LOG(GDPC), LOG(GOVX), POLS and LOG(UBAN) show conformity and significance. In general, the statistical significance strongly suggests that a 1 per cent increase in political instability (POLS) and log of urbanization rate (UBAN) results in about 0.3 and 3.8 per cent increase in terrorism respectively. About 1.7 per cent rise in terrorism is associated with a 1 per cent increase in the log of human development index (HDI). This does not portray apriori expectation. On the other hand, a 1 per cent increase in the log of gross domestic product per capita (GDPC) and log of government total expenditure (GOVX) leads to about 0.2 and 0.2 per cent reduction in terrorism respectively. About 0.1reduction in terrorism is experienced by a 1 per cent increase in the log of inflation rate (INFL) but this result should be treated with caution because it is not in line with economic expectation.

5.4.ARDL DynamicResults

Table5.1 in Appendix shows the impact of all the variables and terrorism in a dynamic framework and where there is the presence of lagged effects. The one year lag of the dependent variable (TERR(-1)) shows the history of terrorism. The positive coefficient of the lagged dependent (TERR) suggests that terrorism is a common

phenomenon in Nigeria. The result indicates that a 1 per cent increase in the incidence of terrorism in the previous year is associated with a 1.0 per cent increase in current year terrorism. The one year lag of the dependent variable (history variable) is important for both theoretical and statistical reasons. It corrects for serial correlation and missing variable bias (Achen 2000, Beck and Katz 2009, Keele and Kelly 2006, Kristensen and Wawro 2003, 2007).

5.5.ARDL Short -run Error Correction Results

Following the estimation of the long run coefficients, the paper proceeds to estimate the errorcorrection model. The paper adopts the general to specific approach to arrive at the parsimoniousestimate by eliminating jointly insignificant variables. The general-to-specific modelling approach is applied to reduce the number of explanatory variables in the initial equation, keeping only the underlying influencing factors based on both statistical significance and the sensible econometric interpretation of the estimated parameters associated with these factors. This approach starts with a general dynamic ADLM, which includes all potentially influential factors with a sufficient lag structure. By removing statistically insignificant variables from the model one by one, starting with the least significant, the general ADLM is reduced to a parsimonious estimate. Following such a scientific procedure, the main causes of terrorism can be identified. The error correction term shows the speed of adjustment to restore equilibrium in the dynamic model. In particular, the ECM coefficients show how quickly variables converge to equilibrium and the ECM coefficient is expected to have a negative sign.As observed by Banerjere et al (1998), a highly significant error correction term is a strongconfirmation of the existence of a stable long run relationship.

From Table 5.2 in Appendix, the empirical results in the short-run indicate that an increase in government total expenditure (LOG(GOVX)), inflation rate (LOG(INFL)), population growth rate (LOG(POPG)) have negative impacts on the occurrence of terrorism in Nigeria. However, the coefficients on (LOG(INFL)) and(LOG(POPG))are wrongly signed. The empirical results in short-run indicate that an increase inLOG(HDI), LOG(GINI), POLS,have positive impacts on terrorism in Nigeria. The results imply that in theshort-run terrorism occurrence increases by 1.0%, 1.5% and 0.2 % respectively. This is as against 1.7% and 0.3% recorded for LOG(HDI) and POLS in the static long run. LOG(GINI) was found not to be significant in the long run.

The first difference of the log of oil export (OEXP) showed statistical significance at 5% level in the short run analysis. Implying that 1% increase in oil export earnings increases terrorism by about0.15%. However, this variable turned out insignificant as shown in the long run result of Table 5.2. Still from Table 5.2, the results show that in the short-run an increase in the one year lag of DLOG(GINI(-1)) reduces terrorism by 2.8%. On the other hand, terrorism increases by 1.0% when DLOG(POPG) increases by 1%. However, in the long run this variable shows insignificance.

The ECM variable has the correct a priori sign and is highly statistically significant. It is negative and significant at the 5 % level. The significance of the ECM supports co-integration and suggests the existence of long – run steady state equilibrium between terrorism and other determining factors in the specified model. The speed of adjustment of -0.41 shows a high level of convergence. In particular, about 41 per cent of disequilibrium or deviation of terrorism from the long-run equilibrium level is corrected in the current period.

5.6.Diagnostic Test Discussions

This paper applied a number of diagnostic test to the error correction model (see Table 6a -6c in Appendix). First of all, there is no evidence of serial autocorrelation as indicated by the value of the DW of 2.1.The Breusch-Godfrey serial correlation Lagrange Multiplier (LM) test for higher order – serial correlation with an F-statistic of 1.028968 which is also statistically insignificant could notreject the null of absence of serial correlation in the residuals.The White-test suggested that the residual is homoskedastic. The Autoregressive conditional heteroscedasticity (ARCH) test for testing heteroscedasticity in the error process in the model has an F-statistic of 0.149536 which statistically is insignificant. This suggests that there is noheteroscedasticity in the model.

As observed by Bahmani-Okooee and Wing NG (2002), the stability of the regression coefficients is evaluated by stability tests and stability tests can show whether or not the regression equation is stable over time. This stability test is appropriate in time series data, especially when one is uncertain when change might have taken place. As such in this paper, the stability test of the long run and short run coefficients using thecumulative sum (CUSUM) and the cumulative sum of squares (CUSUMQ) and Jarque-Bera normality tests was conducted. The null hypothesis is that the coefficient vector is the same in every period. CUSUM and CUSUMQ statistics are plotted against the critical bound of 5 per cent significance. If the plot of these statistics remains within the critical bound of 5 per cent significance level, the null hypothesis, which states that all coefficients in the error correction model are stable, cannot be rejected.The plot of the Jarque-Bera and recursive residual is presented in Figures 2a to 2c in Appendix. As shown in the graphs, the plot of CUSUM and CUSUMQ residuals are within theboundaries. This implies that the stability of the parameters of the model has remained within itscritical bounds of parameter stability throughout the period of study. The result of the Jarque-Bera test lends credence to

the stability of the parameters in the model even though the histogram normality test revealed non-normality of the residual series.From the battery of diagnostic tests presented above, this study concludes that the model is well estimated and that the observed data fits the model specification adequately, thus the residuals are expected to be distributed as white noise and the coefficient valid for policy discussions.

6. Conclusions, Policy Suggestions and Further Research

This paper attempts to investigate domestic terrorism in Nigeria by employing annual data for the time period 1970-2012.In particular, the paper investigated the impact of economic, social, political, demographic, geographic, environmental factors on terrorism in Nigeria using the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration. Substituting specific measures for the generic categories and followed by a detailed time series analysis, the results of the long run and error correction model showed thatLOG(HDI), LOG(GINI), POLS, TERR(-1), DLOG(POPG), DLOG(OEXP(-1)) and DLOG(OEXP) have a positive impact on terrorism in the short run. On the other hand, LOG(GOVX), LOG(POPG), DLOG(GINI(-1)) and LOG(INFL) have a negative relationship with terrorism. The long run static relationship shows that LOG(HDI), POLS and LOG(UBAN) positive impact on terrorism while LOG(INFL), LOG(GDPC) and LOG(GOVX) exhibit inverse relationship with terrorism.The inverse relationship shown by LOG(INFL) in the long and short run should be treated with caution,so should the negative relationship between LOG(POPG) and terrorism.

The calculated F-statistics in the long run and short run models were well above the upper and lower bound critical values. Thus, the null hypothesis of no cointegration is rejected. There is indeed a cointegration relationship among the variables. The coefficient of the error correction model (ECM) of the ARDL is negative and highly significant at 5% level. This confirms the existence of a stable long-run relationship and points to a long-run co-integration relationship among the variables under consideration. The ECM indicates that a deviation from the long-run equilibrium following a short-run shock is corrected by about 41 per cent after each year. The battery of diagnostic tests shows that the model is well estimated and that the observed data fits the model specification adequately, thus the residuals are expected to be distributed as white noise and the coefficient valid for policy discussions.

In conclusion, the paper recognizes that there are economic, social, political, demographic, geographic and environmental factors that influence terrorism but economic variables stand out as the most persuasive, compelling primary explanation for terrorism in Nigeria. Future research needs to determine if the levels of unemployment and higher education that reflect relative deprivation correspond with an increase in terrorist attacks. A recent surge in empirical studies of terrorism has shown that, contrary to popular belief, terrorists tend to be highly educated and from wealthier families than average.

Concerning policy recommendations, since LOG(GDPC) and LOG(GOVX) exhibit inverse relationship with terrorism, government should increase the per cent of the nation's budget expended on health, education etc., that will bridge the very large gaps in well-being and life chances that continue to create a divide in the country. This should be complemented by executing relevant development programmes that will boost the income level of the poor, which is desirable for income redistribution and poverty alleviation.

Although the outlook for growth for the country in the coming years remains positive, cautioned should be taken such that short- and mid-term downside risks like security challenges arising from terrorist attacks, kidnapping among other crimes should not reduced economic growth for the country. In that light, Nigeria's government should step up its intelligence gathering capacity as well as training security agents to forcefully combat acts of **terrorism.**

Nigeria should ensure that political stability is established through good governance, faireness, honesty, justice, transparency and accountability. Therefore, the fight against all forms of electoral malpractices should be intensified. In the same vein, the anticorruption campaign should be reinvigorated. This is because corruption is a product of political process.

Since terrorism is shown to increase with population growth rate, it is wise to check population growth rate through control birth, death rate, migration and some other demographic variables and economic variables.

There should be improvement on the revenue sharing system as well as transparency in the management of public finances given the fact that Nigeria is characterized by a struggle for control over the use of natural resources with a continuing tension between demands from producing regions for a share of the resources and call for redistribution from all other poor regions. In that regard, a greater fraction of the oil revenue should accrue to the oil producing region for them to be satisfied and the remaining part should go to the central government and made available for redistribution to other regions. Also, improved fiscal discipline should be embraced in order to help manage oil revenue. To generate revenue to finance its expenditure, the central government should rely on normal tax policy instruments such as in any non-oil country.

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Appendix

Table 1: Characteristics of Religious and Ethnic-Nationalist Militant Organisations (Nigeria)

No	Name/Location	Social Type	Organisational Variables	Funds
1.	N. Nigeria Boko Haram founded in 2002. Kalo-Kato founded in 200? Maitatsine founded in 1960s.	Islamist. Goal: to purify governance in accordance with Quranic precepts. Purify other Islamic sects said to deviate from Islam. Methods & Message Dissemination: Preaching. Use violence after abused by security agencies. Use of mobile phones for information dissemination; uncertain if used emailing and Internet networking web sites.	Leaders =Sheikhs outside orthodox confessional Islam but recognised by religious authorities. Peaceful methods of spreading the message preferred. Violence resorted to as a last resort. Followers : illiterate/semi-literate subaltern youth with a sprinkling of educated (post-secondary) Hausas; women and adult men; some Chadians. Weapons: largely traditional, few AK47s, rely on traditional weapons e.g. bows and arrows, swords. 'Donations' stolen from the police, maybe also from regimental armouries if proximate. Mobilise through traditional Qur'anic discourses, use magically protective charms. Organisation's culture: symbols of poverty (e.g. poor clothes, the begging bowl) and pious faith, the Qur'an; the sword symbolises righteous Jihad, sacrifice of lives. Charms and white jumpers treated with medicine protect against police/army bullets. Class awareness among subalterns.	A.Donations by : (i)The faithful (ii)Semi-hidden political patrons in middle/higher level government, police/army, para-statals. B.Money raised by: illegal 'operations' e.g. cross-border smuggling (e.g. Chad, Niger). Relationship to trafficking networks in illegal goods not known yet.
2.	S. Nigeria, Niger Delta MEND –Jomo Gbomo.Emerged in 2004, by 2006 had become the principal and best organised militant force. Other important groups =NDPVF –Alh. Dokubo Asari. NDV — Ateke Tom .	Ethnic-Nationalist. Goal: Ethnic-national unity coordinated by Ijaws, pre-dominant over other ethnicities, for Niger Delta resource control. Methods & Message Dissemination: Militant units fighting the Nigerian State for resource control by (core?) N.Delta states. Intensive use of satellite & mobile phones, communication/logistics/troop deployment. Emphasise modern equipment, mobility, surprise attacks on oil infrastructure/personnel, reduce oil output to pressurise FGN/MNCs to recognise resource control demands. Internal conflicts over whether seek 50% repatriation of oil revenues to N Delta communities owning oil/gas, 75% or 100%.Politics: Assumed leadership mantle of struggle over competing organisations for Ijaw and other minority oil revenue rights in 2006. Obscure relationship with formerly very radical, influential Cynthia White Martyrs' Brigade. Message Dissemination: via the Internet and mobile phones. In 2004-8 posted radical and original analyses of causes of Niger Delta poverty and under-development on the Internet . Publicity released in MEND's name reflects an incisive analysis of the major issues, concepts used justify the use of violence as a major weapon against the State.	Leaders : MEND partially hidden, commander Jomo Gbomo, influential Henry Okah, military hardware purchaser, organisation segmentary, units in creek camps, coastal towns and fishing ports for rapid movement by boats, easy evacuation of crude oil bunkered, often close to flow stations. Communicate quickly with dispersed 'boys' (troops) by mobile, satellite phones. Troops :live in swamps, some in towns by wharves for rapid escape to creeks, intelligence gathering. Trained in guerrilla attack strategies by ex-Nigerian army soldiers or mercenaries? Shift camp frequently when under surveillance or attack by the Nigerian navy, airforce or army. Latter have strong interest in controlling bunkering, therefore challenge MEND/ND militant units engaged in crude oil bunkering. Weapons: modern, ample AK47s, bullets, rocket grenades, very powerful motor boats able to travel 200 km to remote oil platforms in the deep ocean. Robotic weapons as yet unreported. 'Donations' of modern weapons by friends or patrons in regimental armouries etc. Organisation's culture: Symbols of militant unrelenting determination for victory include the AK47, the fast speed boat, Ijaw war god Egbesu's shrine, green leaves on militants' foreheads. Sacrifice to juju and charms provide protection against oil company and Nigerian army/navy bullets. Recent symbols are the balaclava pulled fully over the face, except the eyes, to conceal identity. Class consciousness over-laden by ethnic-nationalist identies. Amnesty with FGN, mid-2009. Reluctant to sign, only some sections under Jomo Gbomoh signed. Since no progress in implementation by FGN by December, MEND resumed attacks on oil infrastructure but at a lower level of intensity than hitherto. May/may not have received 'gratification' from Presidency.	Fund raising by: (i)Hostage taking. Use to pay MEND's overheads, fighters' bank accounts and those of community supporters including 'mothers of the community' who feed 'our boys' and as in the Biafran civil war (1967-70) carry out important support work behind the lines. (ii) Armed robbery, sale of oil infrastructure following operations to open up pipelines (on-shore) so to evacuate the crude, bunker it at 'safe' fishing ports, and sell for cash. (iii) Donations of funds by powerful patrons inside government, the security agencies, ex governors with large overseas bank accounts. (iv) Hostage taking. Ransom money is paid, the FGN and MNCs claim they and relatives never pay. A very lucrative business that vigilante/militant groups across Nigeria began to emulate from about 2008. (v) Niger Delta Vigilantes was funded at the outset by ex-Governor Peter Odili, partly during 2003 election campaigns. Amnesty with FGN, mid-2009. First to sign.
3.	Niger Delta Peoples' Volunteer Force (NDVF) and other smaller groups, e.g. NDV	Emerged in 2002, then the leading militant group, attacking oil terminals, flow stations and vandalising pipelines for 'bunkering' or evacuating and selling crude.	NDVF leader Alh. Asari, & NDV Ateke Tom. Now small forces relative to MEND. Complex dynamic relations with other units including MEND. More a 'traditional' area boy style leader, loose knit organisation, more ostensibly reliant on thuggery and open criminality than MEND. First to sign Amnesty with Presidency, 2009.	Funds raised as above. Rewarded by Presidency, nature not disclosed, , 'shares' /'gratification' would be given to Tom by Presidency for being first to support the Amnesty.

Source: Ifeka (2010).

Table 2: Police Record of Some Cases of Kidnapping and Piracy in the Niger-Delta

	Action Date	MNC/OIL Servicing Company	Youth Group/Ethnic Group State	Ascertained Purpose	Outcome
1	Hostage taking of 10 workers/April 2002	Shell	Militant youth gang, Ekeremor LGA, Ijaw/Bayelsa state	Ransom demand for NGN 3.1m	Resulted from failure to yield to alleged frivolous demands
2	Kidnap of staff/June 29-July 2003	Oil servicing company working for shell	Ijaw youth militants in Bomadi/Burutu LGAs/Delta state	Demand for NGN 25.4m	State government intervention/negotiated release after 14 days
3	Kidnap of 9 crew & 4 military escorts of oil barges/November 11-13 2003	-	Ijaw militants	Ransom /other demands	Release 2 days later after threats by state government/security agencies
4	Kidnap of 14 workers/November 2003	Chevron Texaco	Militant Ijaw youths/Bayelsa	Ransom demands	Intervention of state government
5	Kidnap of 19 oil workers	Nobel drilling/prospecting	Ijaw militias/Delta state	Ransom demands	Intervention of state government
6	Kidnap of 7 workers November 28- December 2003	Bredero Shaw Oil servicing company. (Shell)	Militant Ijaw youths Delta state	Ransom demands for USD 5m	State government intervention/negotiation
7	Murder of 7 workers & military personnel/April 2004	Chevron Texaco	Militant youths along Benin River area/Delta state	-	-

Source: Ikelegbe (2005)

Table 4: Cases of Domestic Terrorism arising from Bomb Explosions in Nigeria 1986-2012

Date	**Place**	**State**	**Terrorist Group**	**Casualty**
19/10/1986	Parcel bomb, Lagos	Lagos	Nil	1
31/5/1995	Venue of launching of family support Ilorin	Kwara	Nil	No record
18/1/1996	Durbar Hotel Kaduna	Kaduna	Nil	1
19/1/1996	Aminu Kano Airport, Kano	Kano	Nil	No record
11/4/1996	Ikeja cantonment	Lagos	Nil	No record
25/4/1996	Airforce base	Lagos	Nil	No record
14/11/1996	MMIA	Lagos	Nil	2
16/12/1996	Col. Marwa convey	Lagos	Nil	No record
18/12/1996	Lagos state task force on environment bus in Lagos	Lagos	Nil	No record
7/1/1997	Military bus at Ojuelegba, Lagos	Lagos	Nil	No record
12/2/1997	Military vehicle Fakka D608 at Ikorodu road, Lagos	Lagos	Nil	No record
7/5/1997	Nigerian army 25 seater bus at Yaba, Lagos	Lagos	Nil	No record
12/5/1997	Eleiyele, Ibadan	Oyo	Nil	No record
16/5/1997	Onitsha	Anambra	Nil	5
6/8/1997	Port Harcourt	Rivers	Nil	1
2/9/1997	Col. InuaBawa convey, Akure	Ekiti	Nil	No record

18/12/1997	Gen. OladipoDiya at Abuja airport	Abuja	Nil	1
22/4/1998	Evan square	Lagos	Nil	3
23/4/1998	Ile-Ife	Osun	Nil	5
27/1/2002	Lagos	Lagos	Nil	1000
31/7/2002	Port Harcourt	Rivers	Nil	1
25/11/2006	25/11/2006 PDP Secrtariat, Yenagoa	Bayelsa	Nil	1
5/12/2006	Goodluck Jonathan campaign office	Bayelsa	Nil	No record
23/12/2006	Port Harcourt	Rivers	Nil	No record
12/7/2009	Atlas Cove, Lagos	Lagos	MEND	5
2/5/2010	Yenagoa	Bayelsa	MEND	No record
1/10/2010	Eagle square	Abuja	MEND	8
12/11/2010	Alaibe house Opokuma	Bayelsa	MEND	1
24/12/2010	Jos	Plateau	Boko haram	38
27/12/2010	BarkinLadi	Plateau	Boko haram	No record
29/12/2010	Yenagoa	Bayelsa	MEND	1
31/12/2010	Mugadishu barracks	Abuja	Boko haram	32
2/2/2011	Aba	Abia	Nil	2
3/3/2011	Suleja	Niger	Boko haram	16
16/3/2011	Yenagoa	Bayelsa	Nil	No record
1/4/2011	Butshen-tanshi	Bauchi	Boko haram	No record
6/4/2011	kaduna	kaduna	Boko haram	4
7/4/2011	UnguwarDoki, Maiduguri	Borno	Boko haram	10
8/4/2011	INEC office suleja	Niger	Boko haram	14
8/4/2011	Kaduna	Kaduna	Boko haram	1
9/4/2011	Unguwandoki polling station	Kaduna	Boko haram	5
9/4/2011	INEC collating centre	Borno	Boko haram	No record
22/4/2011	Kaduna	Kaduna	Boko haram	3
14/5/2011	London chiki Maiduguri	Borno	Boko haram	2
19/5/2011	Lagos road Maiduguri	Borno	Boko haram	No record
28/5/2011	Lagos park Zuba/Mammy market	Abuja & Bauchi	Boko haram	18
29/5/2011	Zuba near Abuja	Abuja	Boko haram	8
3/6/2011	Maiduguri	Borno	Boko haram	No record
7/6/2011	Beside St. Patrick church Maiduguri	Borno	Boko haram	10
10/6/2011	Kaduna	Kaduna	Boko haram	No record
16/6/2011	Police force headquarters	Abuja	Boko haram	3
16/6/2011	Damboa Maiduguri	Borno	Boko haram	3
26/6/2011	Beer garden Maiduguri	Borno	Boko haram	25
3/7/2011	Beer garden Maiduguri	Borno	Boko haram	20
10/7/2011	All christian fellowship church Suleja	Niger	Boko haram	No record
26/8/2011	United Nations Office	Abuja	Boko haram	23
6/9/2011	Baga road & Ward Maiduguri	Borno	Boko haram	No record
17/12/2011	Shuwai Area of Maiduguri	Borno	Boko haram	3
22/12/2011	Pompomari near Emir of DamaturuPalaca	Yobe	Boko haram	2
22/12/2011	Timber shed along Bada road Maiduguri	Borno	Boko haram	No record
25/12/2011	St. Theresa Catholic	Niger	Boko haram	43

	Church, Madalla near Suleja			
25/12/2011	Near Mountain of Fire Ministry, Jos	Plateau	Boko haram	12
25/12/2011	SSS Office Damaturu	Yobe	Boko haram	4
26/12/2011	Near Islamic School in Sapele	Delta	Nil	No record
28/12/2011	Near a Hotel in Gombe	Gombe	Boko haram	No record
6/1/ 2012	Attack on some Southerners in Mubi	Adamawa	Boko haram	13
21/1/ 2012	Multiple bomb blasts rocked Kano city	Kano	Boko haram	Over 185 people killed
29/1/ 2012	Bombing of a Police Station at Naibawa area of Yakatabo	Kano	Boko haram	No record
8/2/ 2012	Bomb blast rocked Army Headquarters	Kaduna	Boko haram	No record
15/2/ 2012	Attack on KotonKarfe Prison which 119 prisoners were freed	Kogi	Boko haram	1 Warder killed
19/2/ 2012	Bomb blast near Christ Embassy Church, in Suleija	Niger	Boko haram	5 people injured
26/2/ 2012	Bombing of Church of Christ in Nigeria, Jos	Plateau	Boko haram	2 people killed and 38 injured
11/2/ 2012	Bombing of St. Finbarr's Catholic Church Rayfield, Jos	Plateau	Boko haram	11 people killed and many injured
29/2/ 2012	Attack on Bayero University	Kano	Boko haram	16 people killed and many injured
30/2/ 2012	Bomb explosion in Jalingo	Taraba	Boko haram	11 people killed and several others wounded

Source: Chinwokwu (2012), Ajayi (2012)

Table 5**:** Long run Result (TERR dependent variable)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.817983	2.873654	-0.284649	0.7777
LOG(INFL)	-0.070530	0.036107	-1.953353	0.0596
LOG(GDPC)	-0.196051	0.071677	-2.735196	0.0101
LOG(GOVX)	-0.199564	0.050326	-3.965419	0.0004
LOG(GINI)	0.704836	0.702196	1.003759	0.3230
LOG(HDI)	1.661721	0.319199	5.205910	0.0000
POLS	0.292187	0.079860	3.658748	0.0009
LOG(POVL)	0.113864	0.069915	1.628606	0.1132
LOG(OEXP)	-0.057418	0.070849	-0.810423	0.4237
LOG(UBAN)	3.809514	1.284519	2.965713	0.0057
LOG(POPG)	-0.298183	0.446489	-0.667839	0.5090

R^2 = 0.90; F-statistic = 29.29; D.W = 1.5
Source: extracted from computer output

Table 5.1: Overparametized Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.141445	3.984330	0.286484	0.7784
LOG(INFL)	-0.038104	0.037385	-1.019250	0.3242
LOG(GDPC)	0.285651	0.152513	1.872965	0.0807
LOG(GOVX)	-0.116566	0.076835	-1.517107	0.1500
LOG(GINI)	1.640966	0.889228	1.845383	0.0848
LOG(HDI)	1.692318	0.489300	3.458650	0.0035
POLS	0.209555	0.093954	2.230414	0.0414
LOG(POVL)	0.061772	0.062722	0.984854	0.3403
LOG(OEXP)	-0.232569	0.133916	-1.736682	0.1029
LOG(UBAN)	1.984959	1.865102	1.064263	0.3040
LOG(POPG)	-1.822014	0.658921	-2.765148	0.0144
ECM(-1)	-0.632670	0.293629	-2.154656	0.0479
TERR(-1)	1.000337	0.259384	3.856593	0.0016
DLOG(GINI(-1))	-3.158112	1.235209	-2.556742	0.0219
DLOG(HDI(-1))	-0.363818	0.366194	-0.993513	0.3362
POLS(-1)	-0.163266	0.148945	-1.096154	0.2903
DLOG(POVL(-1))	-0.069851	0.041214	-1.694817	0.1108
DLOG(OEXP)	0.285963	0.125522	2.278185	0.0378
LOG(UBAN(-1))	-3.916353	1.962815	-1.995273	0.0645
DLOG(POPG)	2.424286	0.717664	3.378021	0.0041
DLOG(OEXP(-1))	0.216373	0.103715	2.086222	0.0544
LOG(INFL(-1))	0.022961	0.040431	0.567910	0.5785
DLOG(GDPC)	-0.150083	0.108452	-1.383867	0.1866
DLOG(GDPC(-1))	-0.109698	0.092144	-1.190507	0.2523
DLOG(GOVX)	-0.039202	0.265515	-0.147644	0.8846
DLOG(GOVX(-1))	0.075623	0.194247	0.389312	0.7025

R^2 = 0.97; F-statistic = 20.59; D.W = 2.3
Source: Eviews 4.0 Regression Output

Table 5. 2: Parsimonious Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.824227	2.067881	-0.882172	0.3855
LOG(HDI)	1.012726	0.253217	3.999442	0.0004
LOG(GINI)	1.494196	0.697865	2.141095	0.0414
POLS	0.192907	0.063722	3.027334	0.0054
LOG(GOVX)	-0.141662	0.033580	-4.218600	0.0002
LOG(POPG)	-1.021622	0.397521	-2.569981	0.0160
TERR(-1)	0.929043	0.129907	7.151590	0.0000
DLOG(GINI(-1))	-2.753373	1.022335	-2.693220	0.0120
DLOG(POPG)	1.031938	0.393257	2.624081	0.0141
DLOG(OEXP(-1))	0.184694	0.070223	2.630096	0.0139
ECM(-1)	-0.411380	0.202212	-2.034404	0.0518
POLS(-1)	-0.107476	0.068602	-1.566662	0.1288
DLOG(OEXP)	0.152651	0.059255	2.576166	0.0158
LOG(INFL)	-0.050136	0.028204	-1.777602	0.0867

R^2 = 0.95; F-statistic = 42.28; D.W = 2.1
Source: :Author's Estimation using Eviews 4.0.

Table 6a: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.028968	Probability	0.372020
Obs*R-squared	3.118323	Probability	0.210312

Source: Author's Computation (2013)

Table 6b: White Heteroskedasticity Test:

F-statistic	2.731784	Probability	0.018803
Obs*R-squared	32.26906	Probability	0.094676

Source: Eviews 4.0 Regression Output

Table 6c: ARCH Test:

F-statistic	0.149536	Probability	0.701136
Obs*R-squared	0.156790	Probability	0.692129

Source: Author's Computation usingEviews 4.0

Figure 1: Map of Nigeria exhibiting its 36 states and the federal capital territory.
Source: Wikipedia (2013).

Stability Test

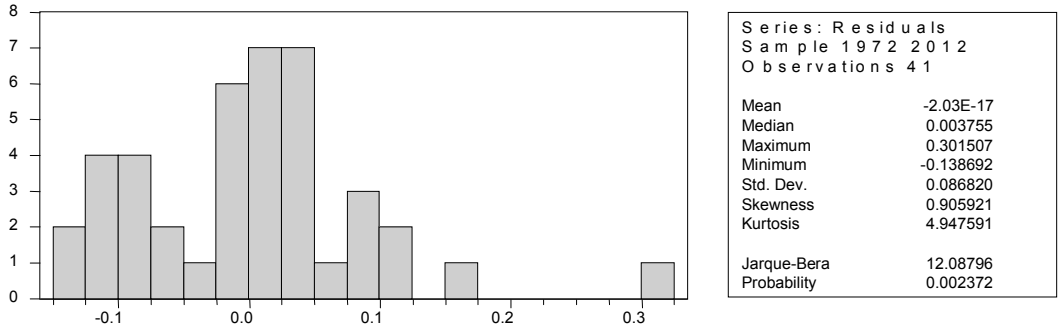

Figure 2a: Histogram – Normality Test

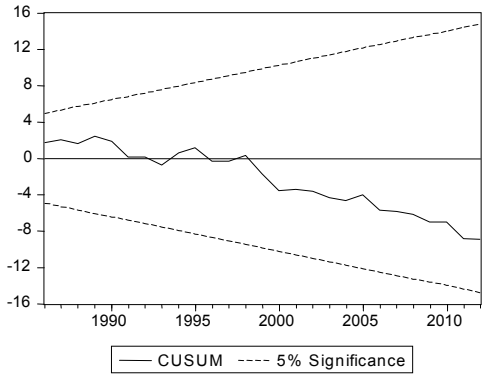

Figure 2b: Recursive Estimates - CUSUM Test

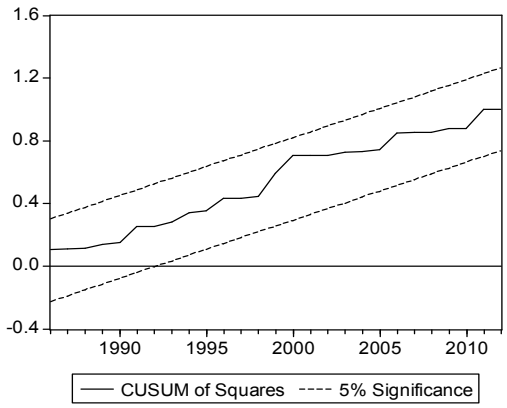

Figure 2c: Recursive Estimates - CUSUM of Squares

Source: extracted from computer output

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