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EMPIRICAL ANALYSIS OF THE TOURISM-TERRORISM NEXUS: THE NIGERIAN EXPERIENCE

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This paper examined the relationship among tourism, terrorism and broad economic aggregates. We made use of the impulse response and variance decomposition of the Vector Autoregression (VAR) on the Nigerian economy from 1995Q1 to 2012Q4. Besides the appropriate unit root and cointegration properties of the variables, the result revealed, that terrorism had negative effects on other variables of the study, especially tourism. Also, shocks in other variables are majorly caused by terrorism. The study also revealed that tourism responds positively to FDI, but its response to GDP and FDI are mixed overtime. Therefore, growth-promoting and other complimentary policies that will engender aggregate welfare improvement need to be pursued to ensure that the tourism sector sidestep the adverse consequences of terrorism.

Keywords: *Tourism, Terrorism, Gross Domestic Product, Foreign Direct Investment, Oil revenue.*

INTRODUCTION

Although substantial research effort has been exerted around the concept of tourism, terrorism, and economic growth, the precise nature of the relationship remains inconclusive. For example, major research on economic growth and tourism support that tourism granger causes growth, thus, embracing the tourism-led growth hypotheses (see for instance Dritsakis 2004, Hye and Khan 2013, Lean and Tang 2010, Trang*et al* 2014). The other side is the growth-led tourism hypothesis which supports that growth has significant impacts on tourism. Such studies like Lee (2008), Oh (2005), Suresh and Senthilnathan (2014) argue for the promotion of a growth-led tourism hypothesis. Another strand of literature on these subjects is a middle ground conclusion that both tourism and growth granger causes each other, Corrie *et al* (2013), Kibara *et al* (2012), Tang and Tan (2013).

Even though the causal relationship between tourism and growth produces different results, it appears more intuitive that tourism positively impacts economic growth. Attention of nations has thus been drawn to the importance and prospects of tourism. Tourism is a fast growing service sector in the world, which can impact the nation's economy through employment creation, investment rise, higher income to the government through tax revenue and increased foreign exchange earnings (Tang and Abosedra, 2014). Increase in touristarrivals can also boost the economy through innovative ideas of tourists and cross cultural interaction that can be enhanced by tourism activities.

Literature on Foreign Direct Investment (FDI) and growth lines up behind the two theoretical strands of modernisation and dependency theories. The modernisation theory is based on the

capital investment requirements needed for the economic growth of developing nations, which is empirically backed up by studies like Aluko (1961), Ibrahiem (2015), Obinna (1983) and Zhang (2001). Knowing the importance of investment, the dependency theorist however opined that the depending on FDI is like grooming an economy controlled by foreigners and foreign factors. Thus, bringing about the negative effects that FDI has on growth. Studies like Adelegan (2000), Agosin and Mayer (2000), Akinlo (2004), Hermes and Lensink (2003), and Sylvester (2005),. Thus, the FDI impact on growth remains inconclusive.

In terms of contribution to GDP and foreign exchange earnings, Nigeria economy can be divided into agro-dominant period (i.e pre-oil discovery; up to 1960) and oil-dominant period (after the discovery of oil). According to Akinlo (2012), the oil subsector has played major and dominants roles in the nation's economy since its discovery in 1958. These roles can be traced to its production, its size in the GDP, its export and share in total export, and its revenue share. Oil production rose from 16.80 million barrels in 1961 to 760.1 million barrels in 1980, while it was recorded that the nation produced 919.3 million barrel in the year 2005. As a percentage of total GDP, oil production contributed a meagre of 0.9% as at 1961, increased to 28.48% in 1980, and then to 47.72% in 2000. Since 1980, oil exports yearly accounts for over 90% of the total export in the country. As at 2005, it accounts for 98.53% of the total year's export. This relatively reflects in her oil revenue and its share in the total revenue of the nation, which has over the years contributed more than 70% of the nation's total revenue. Between 1971 and 2005, Nigeria has gained US$390 billion in oil-related fiscal revenue, Budina and Wijnbergen (2008). These all gave account of how dependent the nation's economy has relied heavily on crude oil earnings.

Terrorism is the use of violence by a group of individuals with common interest on a larger group, usually the government, in order

to achieve their objectives. In most cases, their activities lead to death of large number of people. Pressures mounted by terrorists can either be conceded to by the government or rejected based on government's weighing the costs of the terrorist's actions and conceding to their demands. The cost, of the destructions can either be direct or indirect. Enders and Olson (2012) define direct costs of terrorism as the value of tangibles damaged or destroyed such as factories, equipment, housing and structures and merchandise. The indirect cost can be linked to the non-monetary or immeasurable damage, such as the psychological effects of terrorist attacks.

Although the motives of different terrorism acts differ, their effects tell on macroeconomic variables. Incidences of terrorism can result in slowdown in foreign direct investment (FDI) flows, as investors seek safe haven for their investments, which also invariably leads to trade diversion. It can also distort public spending by channelling extra funds to destroyed public infrastructures and necessitating undue attention to security spending. All these eventually affect economic growth because both investments and government's expenditures are crucial determinants of growth. Studies such as Bandyopadhyay *et al* (2013), Enders, Sachsida and Sandler (2006), Rasheed and Tahir (2012) supports the depressed effects of terrorism on FDI. There are also contagion effects of terrorism on neighbouring nations and trading partners of the nation.

Also, withstanding terrorism attack can be a major concern to nations, especially developing ones which have little capacity to absorb shocks. Economic size and diversification has a lot to do with the ability of a nation to withstand attacks without adverse economic impact. Advanced nations have strong economic size to absorb economic losses, brought about by terrorist attack. At the same time, in the wake ofany attack on a microeconomic target, such as the tourism industry, these advanced nations can easily reallocate resources to other sectors of the economy and still maintain its growth path. This is not the case with most developing

countries, because they are mostly monoculture in economic structure. Take another instance, where such an attack is targeted towards the primary sector of a developing nation, which happens to be less diversified, the economic effect of such will be too hard for the nation to bear. Thus, for developing countries, terrorism can drastically reduce the growth of gross domestic product and hamper development. Thus, the effects of terrorist attack are more felt by developing nations compared to developed nations who have enough capable institutions to make use of policies to absorb the shocks and buffer the effects of terrorist attack. These macroeconomic impact of terrorism are supported by studies such as Bloomberg *et al* (2003) and Eckstein and Tsiddon (2004).

The effects of terrorism attack will be felt more in a nation like Nigeria as a developing nation whose size of her economy is not large enough and well-structured to absorb high terrorist attack, especially a microeconomic or industry-specific attack. The Nigerian economy is not diversified, thus largely depending on crude oil, as it dictates a large portion of both her gross domestic product (GDP) and government earning. Therefore, terrorist attack and campaign against her oil sector will significantly affect her economy growth and hamper her development. Thus, the main purpose of this study is to look into the shocks and their decomposed nature among the variables of interest, with particular emphasis on tourism, terrorism and growth.

The rest of the study is arranged thus; section two reviewed the literature while section three presented the methodological strategy of the work. The estimated results are presented in chapter four, while section five gave the conclusions and policy recommendations of the study.

LITERATURE REVIEW

Tourism and growth:

In recognition of Africa's potential for growth and her backdrop in its utilization, Kareem (2013) carried out a study among thirty nations in Africa, between 1990 and 2011 using panel cointegration analysis. His findings also support that tourism export also brings about long run growth in Africa. Meaning that tourism export can be harnessed to bring about economic growth in Africa.

Kibara*et al* (2012) uses an autoregressive distributed lag (ARDL) model on the Kenyan economy between 1983 and 2010. They found that tourism does not only impact economic growth, but also the trade balance. Also, Belloumi (2010) finds that tourism has a positive impact on economic growth in the Tunisian economy after using an annual data between 1970 and 2007.

Studying the South African economy between 1980 and 2005, with focus on the direction of causality between international tourism earnings and growth, Akinboade and Braimoh (2010) using a multivariate vector autoregressive model, found that both in the long run and short run, there exists a unidirectional relationship from international tourism earnings to real GDP.

A point worth noticing from the studies reviewed above is that it entails developing nations; thus, it can be established that tourism serves as an important factor that can be considered to boost the economic growth of developing economy.

Terrorism and growth

Enders and Olson (2012), analyses the economic costs of terrorism with references to various empirical proofs of the effects of terrorism on both microeconomics and macroeconomics. Pointing out the major 9/11 attack, the authors analyse different estimated direct and indirect costs of the incidence with the conclusion that; calculating the full cost of the incidence may not be plausible due to indefinite line of defining the costs. In terms of the microeconomic or sectorial effects of terrorism, the authors pointed out that the size

of an economy, trade and financial openness, and even the economic system play important roles. Countries with more open economic boundaries are vulnerable to terrorist attack, and at the same time since terrorist attack will necessitate the redistribution of resources to various sectors, market-based economies tend to be more efficient in carrying out such. As regards the growth effects of terrorism, it can be deduced from their opinion that terrorism can disrupt growth through its effects on elements that constitutes growth, such as infrastructures, factories and FDI. In conclusion, the authors pointed out that economic diversification cum price mechanism can help reduce the cost of terrorism. The macroeconomic consequence of terrorism can also stem from enacting policies to counter further attack, because when terrorism is on an increasing pathit leads to private spending being overshadowed by government spending.

The impact of transnational terrorism on U.S foreign direct investment (FDI) was studied by Enders, Sachsida and Sandler (2006). Using both time series and panel estimation techniques on data spanning1994 to 2002, they arrived to know that the September 11 attack does not have lasting effects on against US FDI flows. The panel estimate grouped the countries into OECD and Non-OECD countries. The result shows that foreign attacks that are US oriented happen to have significant effect on FDI in the OECD countries, but insignificant in the non-OECD countries. This can be deduced that US FDI in OECD countries is more vulnerable to shocks than in Non-OECD countries.

Studying the macroeconomic consequences of terrorism in an unbalanced panel of 177 countries spanning between 1968 and 2000, Blomberg, Hess and Orphanides (2003) focused on the economic impact of terrorism, and the extent to which activities are reallocated across private and public spending, as a result of the incidence of conflicts and terrorism. At the same time, their study uses a structural VAR to check the effects of terrorism and other forms of violence on the per capita GDP. Their study concludes that,

although terrorism has significant negative effects on economic growth, its effects are less than the effects of other forms of violence like external wars or conflict. In particular, the incidence of internal conflicts reduces the GDP per capita ten times more than the reduction in an associated terrorism incidence. It is also evidenced from their study that the OECD economies had more frequent terrorist attacks than other group of economies, but the effects on their growth is smaller compared to that of developing economies. This can stem from the fact that developed nations as a result of their sizes and economic diversification can absorb more shocks from terrorism than developing countries. The study also conclusively found that terrorism leads to redirection of economic activities from investment spending towards government's spending.

In the case of Israel, Eckstein and Tsiddon (2003) researched on the macroeconomic consequences of terrorbetween 1950 to 2003 using a vector autoregressive (VAR) framework. Their result reveals that high rate of terror decreases output, consumption, investments and exports, significantly. Meaning that terrorism negatively affects important macroeconomic variables. If terror, which happens to cause the same death rate with car accident, was absent in the last three years of the study, it was predicted that consumption and output per capita will rise about 5 percent higher than their rates at the end of the study year. Years of terror between 2000 and 2003 lowered the output per capita and nondurable consumption per capita of Israel by over 5% and 10% respectively. Between the periods also, the ratio of governments' expenditure to GNP increased by 3%.

Terrorism and Tourism

Sonmez (1998) studied the relationships between tourism, terrorism and political instability. She pointed out common grounds between terrorism and tourism, as in line with Schlagheck (1988)

that both occurs across national borders, involve citizens of different countries and makes use of both travel and communication technologies. In the case of terrorist incidence, the effects on countries may differ, but their tourism industries face similar challenges, although to different degrees. In the light of this, the author made case studies of countries including; China, Egypt, Israel, Mexico, Spain, North Ireland, Gambia, Turkey, Zambia, Zimbabwe and a host of others, where terrorism and political unrest has affected tourism in various ways. The author made a comprehensive summary of past literatures from 1990 to 1998 that focuses on tourism, terrorism and political instability pointing out various ways in which the latter two have affected the former.

Ahlfeldt *et al* (2015) studied the effects of the 9/11 attack and some other minor attacks before and after the 9/11 attack, on tourism demand. In order to filter the effects of terrorism on tourism demand from unobserved macroeconomic shocks, the authors made use of the Difference-in-Difference Approach (DiD). The study takes account of geographic and religious proximity. It was found that the general tourist trends for countries in Africa, America, and Australia did not significantly deviate after the 9/11. The effects of the 9/11 attack was negatively and significantly felt by the Asia and Middle East countries in their tourist volumes. On the ethnic religious platform, the growth rates of tourist volumes to Islamic destinations few years after were below that of non-islamic countries. This gave a pointer that the consequences of the attack is sensitive to proximity and religious stance.

Karagoz (2008) conductedaon Turkey to look at the effects of terrorism on tourist arrivals between 1961 and 2006. Using the exogenous structural break tests of Augmented Dickey-Fuller (ADF) and the Phillips's Peron (PP), the study found that there are double shocks between the study periods taking place in the late 1970s and the late 1980s. The study went further to reveal that these shocks have temporary negative effects on the growth rate of tourist

arrivals, but a permanent negative effects on the constant level of tourist arrivals.

Edmonds and Mak (2006),observed that tourism sector, which happens to be fragile, is crucial to many Asia Pacific countries. They found that Japan and the U.S, after the 9/11 attack have significantly substituted domestic travel for overseas travel, and this has drastic effects on Hawaii's tourism market. In relating the effects of terrorism on tourism industry, Singh (2013) finds the role of media very important in neutralising the deteriorating influence of terrorist attack. The author also gave strategies for managing terrorist crisis to include crisis management plan and task force for crisis management.

Having gone through the literature, our concern is to fill the gap of scarcity of shocks-predicated studies. Thus, this study tends to look into shocks relationship among the variables, especially tourism, terrorism and economic growth in the Nigerian context. This will add to the few existing literature on terrorism shocks, in that most related studies, as reviewed above do not include shocks-response in their analysis. Also, this study will help to gauge the effects of terrorist attack on the macroeconomic and tourism industry in Nigeria.

METHODOLOGY

Although, as reviewed above, literature around studies on terrorism and tourism like this are carried out in both time series and panel data forms. However, there are justifications of preference for a time series study than a panel one. These added to the reason for the option of a time series study like this ahead of a panel option.

Time series can easily be used to evaluate shocks and the system's adjustments over time. In addition, microeconomics impacts of terrorism can easily be identified using a time series study. But a panel study of vast number of diverse countries may not depict a true picture of the relationship within specific countries. At

the same time, the diverse nature and definition of terrorism are used by different sources of terrorism data for different countries, thus a panel work might be bias by using different sources of data estimates. Also, countries have different degrees and strengths to absorb terrorist attacks, due to their level of development, economic diversification and institutional structure. Therefore, subjecting them under the same model may produce an average estimation that will not carry the true picture of some of the countries. Lastly, even if the aforementioned weaknesses are conquered, countries that look alike, in terms of development and economic situations, also faces different levels of terrorism incidence. Therefore, facing a country study will bring out the true picture and reality of tourism, terrorism and economic issues in a country.

The essence of this study is to look into the shocks interaction between tourism, terrorism and other important economic variables, such as; FDI, crude oil receipt and economic growth in Nigeria using a Vector autoregressive (VAR) framework. This helps to study the shock effects of terrorism on both macroeconomic – FDI and GDP – and microeconomic or industry specific – tourism and oil sectors. This work serves to add to the few literature on shock-based study on tourism, which also, to the best knowledge of the authors is a new ground in the Nigerian case. The inclusion of crude oil receipt and foreign direct investment (FDI), stems from the importance of both variables for Nigeria's growth.

The study employs the Vector Autoregressive (VAR) model, which are also used by other related studies such as Bloomberg *et* al (2003), Chatziantoniou*et al* (2013) and Dritsakis (2004),. It has the advantage of presenting the dynamic structure of the variables, but its shortcoming is the opinion that VAR is a theoretical. The model used is given below:

$$Z_t = A_0 + A(L)Z_{t-P} + u_t.$$

Where Z_t serves as the vector of the variables (tourism, terrorism, oil revenue, GDP and FDI).Z_{t-p}serves as the vector of the variables

up to the lag length p, and U_t is the vector of random error terms. Thus, in the form below:

$$\begin{bmatrix} \Delta TOU_t \\ \Delta TER_t \\ \Delta OIL_t \\ \Delta GDP_t \\ \Delta FDI_t \end{bmatrix} = \begin{bmatrix} A_{1t} \\ A_{2t} \\ A_{3t} \\ A_{4t} \\ A_{5t} \end{bmatrix} + \begin{bmatrix} A_{11}(L) & A_{12}(L) & A_{13}(L) & A_{14}(L) & A_{15}(L) \\ A_{21}(L) & A_{22}(L) & A_{23}(L) & A_{24}(L) & A_{25}(L) \\ A_{31}(L) & A_{32}(L) & A_{33}(L) & A_{34}(L) & A_{35}(L) \\ A_{41}(L) & A_{42}(L) & A_{43}(L) & A_{44}(L) & A_{45}(L) \\ A_{51}(L) & A_{52}(L) & A_{53}(L) & A_{54}(L) & A_{55}(L) \end{bmatrix} \begin{bmatrix} \Delta TOU_{t-1} \\ \Delta TER_{t-1} \\ \Delta OIL_{t-1} \\ \Delta GDP_{t-1} \\ \Delta FDI_{t-1} \end{bmatrix} + \begin{bmatrix} u_{1t} \\ u_{2t} \\ u_{3t} \\ u_{4t} \\ u_{5t} \end{bmatrix}$$

Tourism in this study is proxy by tourism receipt, sourced from the World Development Indicator (WDI). This tourism receipt includes receipts from international visitors, and it's expected to be affected by terrorism, unlike domestic tourists whose tourist expenditure is not likely to be affected by terrorism insurgents, as they are aware of places to avoid. Terrorism is proxied by the number of terrorism incidents in the country, as collated by the National Consortium for the Study of Terrorism and Responses to Terrorism (START), for the Global Terrorism Database (GTD). The oil and GDP are the oil revenue and real GDP of Nigeria sourced from the Central Bank of Nigeria (CBN) *Statistical Bulletin*, while foreign direct investment is represented by the net inflow of the FDI, also sourced from WDI. The data ranges between 1995 and 2012. As a result of data insufficiency and the necessity to fulfil the number of observation criteria, all the data, except terrorism, were sourced in their annual form, but transformed into quarterly data using the approach of Lisman and Sandee (1964). This transformation approach takes into account the seasonality of the data set.

RESULTS AND DISCUSSION

Table 1: Descriptive Statistics and Correlation Matrix.

	TOURISM	TERRORISM	OIL REV	GDP	FDI
Descriptive Statistics					

Mean	10,400	16.15	815.20	137.22	127
Maximum	31,400	200	2,309.14	227.22	65
Minimum	743	0	69.07	86.58	35
Std. Dev.	11,000	35.82	676.60	41.96	11.2
J-B (Prob)	12.14(0.00)	6.13(0.05)	6.57(0.04)	6.75(0.03)	8.41(0.01)
Correlation Matrix					
TOURISM					
TERRORISM	0.5107				
OIL REV	0.7535	0.6326			
GDP	0.8814	0.6654	0.9234		
FDI	0.9107	0.5439	0.8760	0.9424	

The descriptive statistics of the data used and their corresponding correlation matrix are presented in table 1. The result shows the mean, minimum and maximum values of the variables as well as the extent of dispersion of the observations on each series as captured by the standard deviations. This statistic clearly indicates that the tourism is the most volatile and FDI the least volatile of the series. The results further confirm the normality of the series as evidenced by the probability values of the J-B statistics which were found to be significant. The unit root check for stationarity conditions of the variables are presented in the table 2. The Augmented Dickey-Fuller (Dickey and Fuller, 1979)and Phillips Peron (Phillips and Perron, 1988) unit root tests, which are widely used tests, were used to confirm that all the series used in this study are all stationary at first difference. This implies that, even though they are not stationary at levels, all are stationary when differenced in the first order, some at 5% with most of them at 1% significance level.

Also as a diagnostics test, the Lag Length Selection Criteria was also carried out, which pointed out that the lag length as supported

by all the criteriais 6, as presented in table 3. Thus, this lag length was used to perform the cointegration test as presented in table 3.

In order to ascertain the long run relationship among the variables, the Johansen Cointegration technique (See Johansen, 1996) was used, which proved that both the Trace and Maximum Eigenvalue statistics provide the evidence that there are two cointegrating equations among the variables. The result is reported in table 4.

Table 2: Unit Root Test Result

	AUGMENTED DICKEY FULLER					PHILLIPS PERRON				
	LEVELS		FIRST DIFFERENCE		DECISION	LEVELS		FIRST DIFFERENCE		DECISION
	CONSTANT	CONSTANT & TREND	CONSTANT	CONSTANT & TREND		CONSTANT	CONSTANT & TREND	CONSTANT	CONSTANT & TREND	
TOU	−0.9873 (0.7533)	−2.1195 (0.5254)	−5.7460 (0.0000)**	−5.7130 (0.0001)**	I (1)	−1.2986 (0.6260)	−2.1952 (0.4847)	−4.2361 (0.0012)**	−4.2174 (0.0070)**	I (1)
TER	−0.6798 (0.8437)	−2.4696 (0.3413)	−5.1154 (0.0005)**	−5.7095 (0.0003)**	I (1)	−0.5075 (0.8829)	−1.6617 (0.7578)	−10.6345 (0.0001)**	−10.8351 (0.0000)**	I (1)
OIL	−1.4770 (0.5394)	−2.6545 (0.2585)	−4.3359 (0.0008)**	−4.9833 (0.0007)**	I (1)	−1.4052 (0.5751)	−2.0949 (0.5395)	−4.5086 (0.0005)**	−4.5363 (0.0027)**	I (1)
GDP	0.4276 (0.9826)	−2.1613 (0.5031)	−3.0282 (0.0371)*	−3.9533 (0.0148)*	I (1)	3.2886 (1.0000)	−1.5973 (0.7844)	−2.9263 (0.0474)*	−3.9648 (0.0143)*	I (1)
FDI	−0.6851 (0.8429)	−1.9633 (0.6100)	−3.5900 (0.0085)**	−3.5654 (0.0407)*	I (1)	−1.6683 (0.4428)	−2.1272 (0.5218)	−5.0897 (0.0001)**	−5.0924 (0.0004)**	I (1)

** and * denotes significant at 1% and 5% respectively.
Source: Estimated by the Authors'.

Table 3: Lag Length Selection Criteria Result

Lag	Lag Log Likelihood	LR statistic**	Final prediction error (FPE)	Akaike information criterion (AIC)	Schwarz information criterion (SC)	Hannan–Quinn information criterion (HQ
0	-4367.088	NA	2.38e+51	132.4875	132.6534	132.5531
1	-3859.426	923.0231	1.06e+45	117.8614	118.8567	118.2547
2	-3782.311	128.5239	2.21e+44	116.2822	118.1069	117.0032
3	-3761.411	31.66745	2.59e+44	116.4064	119.0605	117.4552
4	-3730.713	41.86033	2.33e+44	116.2337	119.7173	117.6102
5	-3600.387	157.9705	1.07e+43	113.0420	117.3550	114.7463
6	-3530.185	74.45752*	3.24e+42*	111.6723*	116.8146*	113.7043*

The * indicates lag order selected by the criterion.
Source: Estimated by the Authors'

Table 4: Cointegration Test Result.

Unrestricted Cointegration Rank Test (Trace)				**Unrestricted Cointegration Rank Test (Maximum Eigenvalue)**			
Hypothesized No of CE(s)	Eigenvalue	Trace Statistics	Probability**	Hypothesized No of CE(s)	Eigenvalue	Maximum Eigen Statistics	Probability**
None *	0.5794	115.427	0.0000	None *	0.5794	56.3018	0.0000
At most 1 *	0.3979	59.1258	0.0031	At most 1 *	0.3979	32.9817	0.0092
At most 2	0.2271	26.144	0.1245	At most 2	0.2271	16.7458	0.1843
At most 3	0.1341	9.3984	0.3298	At most 3	0.1341	9.3614	0.2573
At most 4	0.0006	0.0370	0.8475	At most 4	0.0006	0.0370	0.8475

Trace and Max-eigenvalue test indicates 2cointegratingeqn(s) at the 0.05 level
* denotes rejection of the null hypothesis of no cointegration at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Source: Estimated by the Authors'

Impulse Response

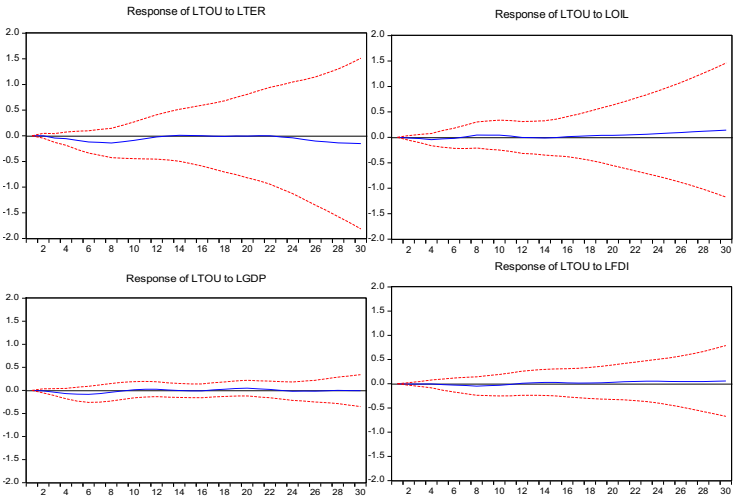
The impulse response measures shocks and the corresponding responses among variables. This depicts how various variables react to sudden disruption from other variables in a model. Here, we paid attention to the response pattern of tourism to other variables in our VAR model.This is showed in our figure 1. At the same time, we also paid attention to the responses of other variables to shocks from terrorism in the model, which is also depicted in figure 2. The

confidence intervals are represented by the dotted lines. How the variables deviate from the baseline as a result of a given shock from other variables is measured by the vertical line. The horizontal line only measures the time path of response after the shock has been introduced.

Response of tourism to each of the other indicators

The sets of graphs below give the responses of tourism to each of the other variables in the study. The first graph gives the response of tourism to terrorism shocks, which as expected is negative. This means that the higher the rate of terrorist incidence, tourism receipt will fall, but latter will converge back to the base line within the approximate time of thirteen (13) quarters. The shocks effect will stabilise overtime but will later in the long run still negatively affect tourism receipt. This can be attributed to the long term psychological effects that terrorist attacks have on the perceptions of tourists. The shocks reaction of tourism to oil revenue is displayed by the second graph, which happens to be initially negative but more of positive in the long run. The explanation to this can be that much of the investments in the oil sector are done by foreigners. Thus, as investments in the oil sector increases, which will also increase the oil revenue, the investors who are majorly foreigners are likely to increase their visits and spending on tourism. Alternatively, the link can be that as tourism grows, the demand for oil increases due to the demand for oil increases due to the derived demand from an increase in the demand for transportation services and other oil consuming tourism activities. The third and fourth graphs show that the response of tourism receipt as a result of shocks from economic growth and foreign direct investment (FDI) happens to be infinitesimal. The shock is recovered back in the tenth and twelfth quarters respectively and hovers very closely around the base line.

Figure 1: Response to Cholesky One S.D Innovations ±2 S.E

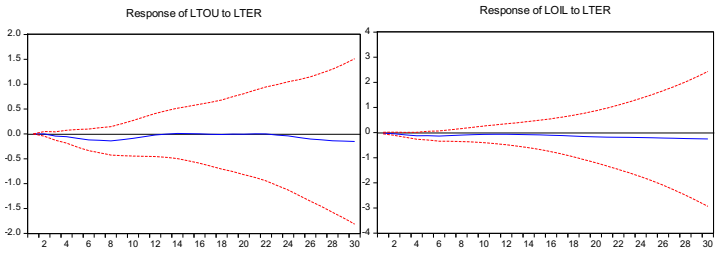


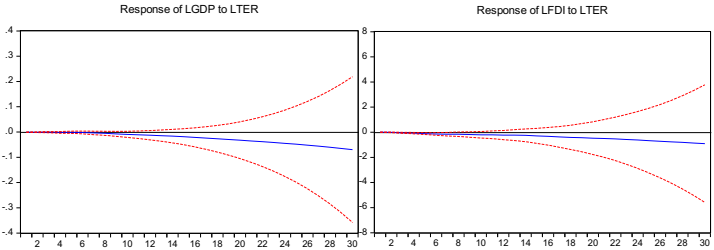
Response of others to terrorism

The negative shock effects of terrorism on other variables are presented in figure 2, which all conforms to *a priori* expectations in various degrees. The first graph shows that tourism receipts falls up to thirteen quarters as a result of a shock from terrorist attack. It is clear from the graph that a rise in terrorism leads to fall in tourism receipts. Nigeria, being an oil dependent state shows that her oil revenue will decline as a result of terrorist incidence, meaning that

oil revenue in Nigeria responds negatively to a shock from terrorist incidence. Industry or sector specific terrorist attack on the oil sector will reduce oil activities in the sector and at the same time the infrastructure in place, leading to a fall in the revenue from the sector. The negative response of oil revenue to terrorist attack is expected to also filter into the reaction of GDP to terrorist shocks as showed in the third graph. This is as a result of the nation's heavy reliance on crude oil as the mainstay of the economy. From the third graph, it can be seen that the gross domestic product (GDP) keeps diverging from the baseline as a result of terrorist shocks. In addition to the changes through the oil sector, the response of GDP can also be linked to the response of foreign direct investment (FDI) as depicted in the fourth graph. Investors typically prefer a safe haven for their investments, this is a more reason why FDI also continues to negatively move away from the baseline, just like the GDP and revenue from oil. Nigeria, being an oil dependent nation and a major attraction of FDI in sub Saharan Africa, will have a negative GDP reaction to terrorist shocks through the oil revenue and FDI channels.

Figure 2: Response to Cholesky One S.D Innovations ±2 S.E





Variance Decomposition

The evidence of a long run relationship among the variables can also lead to a conclusion that the variance of any of the variables of interest can be apportioned to both itself and other variables. This means that there exist proportional contributions of each of the variables to variation in the other at different periods. This is what the variance decomposition looks into, i.e., how the variances in each of the variables are decomposed among other variables in the study. This is important, as it proportionally attributes the change in a variable to other variables in the model, thereby pointing out major contributors of changes in a variable. A major note here is the fact that the results are plausible and conforms with*a priori* expectations. Table 5 below houses the results. To avoid the jam of data in the table, an abridged version of the result is presented, which reflects the overall pattern of the result. The full result can however be supplied upon request.

The first section of the table gives the variance decomposition of tourism. The result shows that tourism receipts account for all of its variation in the first quarter. By the third quarter, besides tourism, terrorism and the GDP accounts for more of the variations in tourism to the tune of 1.67% and 1.26% respectively. Up to the tenth quarter, the variation of tourism attributed to itself continues to decline, while the contribution of other variables continued to averagely increase with more contribution still coming from both terrorism and GDP. This impact was earlier established by the

impulse response to be negative and positive respectively. It can be deduced from this that the major contributor to changes in tourism receipt in Nigeria is terrorist incidence. Thus, policies meant to increase growth through tourism receipt should equally aim to lower the incidence of terrorism in the country, as this is a major factor that causes a decline in tourism receipt. The role of the oil revenue and FDI to the change in tourism is straight forward; development in the tourism sector will be financed by the oil revenue, which is the major source of revenue of the country. This variance decomposed to oil revenue tends to be positive as proved by the impulse response result. At the same time the Foreign direct investment, directly or indirectly through its growth effects also contributes to variation in the tourism receipt.

From the result, the major contributor to variations in terrorism attack happens to be the oil revenue and GDP. Oil revenue is a major booster of the nation's GDP. Besides oil revenue itself, terrorism and tourism are the major variation inducing factorsfor oil revenue contributing 2.08% and 9.43% respectively in the third quarter. A major point worth noting from this result is the increasing growth rate of an average of about 90% over the whole quarters of study, played by terrorism in the variation of oil revenue in Nigeria.

Besides GDP itself, the decomposition of GDP variance right from the first quarter has been attributed to oil revenue and tourism, but the contribution of tourism overtime on the average fell while the contribution of terrorism actually rises to predict 20% of GDP variation by the tenth quarter. The contributions of oil revenue to variation in GDP are approximately 29.46%, 48.13% and 52.51% in the first, fifth and tenth quarters respectively. The contributions of FDI also keep increasing overtime with its highest contribution of 11.34% of the variation in GDP in the seventh quarter. It is also worth noting that the contribution of GDP to the variation of itself decreases as the time period increases. As at the firstquarter, the FDI variation is largely attributed to itself, the GDP and oil revenue. The

reason for this is not far-fetched, as economic performance is a major short run attraction of foreign investments.

Table 5: Variance Decomposition Result

PERIOD	S.E.	TOURISM	TERRORISM	OIL REV	GDP	FDI
Variance Decomposition of Tourism:						
1	0.1391	100.0000	0.0000	0.0000	0.0000	0.0000
3	0.3549	96.6283	1.4695	0.5908	1.2599	0.0513
5	0.5588	90.4140	4.1411	1.1728	4.1333	0.1386
7	0.6683	83.1486	9.8349	0.9176	5.5504	0.5482
10	0.7234	75.4446	16.153	1.8939	5.1048	1.4025
Variance Decomposition of Terrorism:						
1	4.8942	0.4700	99.5299	0.0000	0.0000	0.0000
3	5.5553	2.5098	82.0461	4.8002	6.8960	3.7477
5	6.2883	1.9768	67.5519	17.1395	9.3948	3.9368
7	6.6626	8.0312	63.9059	15.3043	8.9508	3.8077
10	6.9155	8.4193	63.4312	15.1307	8.8516	4.1669
Variance Decomposition of Oil Revenue:						
1	0.1278	3.2633	2.6660	94.0705	0.0000	0.0000
3	0.3382	2.0822	9.4303	87.7120	0.7378	0.0376
5	0.5089	1.4222	16.2445	81.2092	1.0165	0.1073
7	0.5952	1.1835	21.2592	75.7958	1.1876	0.5736
10	0.6597	1.2525	22.4375	73.5656	1.5891	1.1551
Variance Decomposition of GDP:						
1	0.0028	11.7054	7.6244	29.4637	51.2063	0.0000
3	0.0082	15.1827	3.3488	35.3047	44.3405	1.8230
5	0.0136	10.6043	3.5138	48.1262	31.1726	6.5828
7	0.0187	6.0219	6.9368	56.7453	18.9585	11.3373
10	0.0314	8.6324	20.3419	52.5060	7.4722	11.0472
Variance Decomposition of FDI:						
1	0.0586	1.8754	0.8523	3.9884	43.2619	50.0218
3	0.1411	10.7425	11.6236	5.4209	18.5386	53.6741
5	0.2660	24.6583	26.9356	9.2160	6.4282	32.7618
7	0.4308	29.0777	33.9037	15.6629	3.7652	17.5903
10	0.6505	22.9730	38.7194	24.4339	1.9953	11.8782

Source: Estimated by the Authors'

In general, the variance decomposition shows that the variations in all the variables are attributed mostly to terrorism. This demonstrates the effects of terrorism activities in Nigeria, which over the years has been felt more in the northern states of the country.

Vector Error Correction Model (VECM)

Besides the estimation of the impulse-response and the variance decomposition analyses, the study went further to estimating the vector error correction model (VECM), which result is presented in table 6. Only the significant values are reported for the sake of space. The result shows that all the variables are autoregressive in nature, as they are affected by their various lagged values in different quarters. The result also shows that terrorism is also affected other variables in the study, except FDI. Tourism affects terrorism, because tourist centres are attractions of terrorists, therefore constant tourist visitations to these places propels more terrorism incidence, and vice versa. The result also revealed that the GDP is also affected by terrorist attack and FDI. Terrorism affects FDI as investors are careful of investing their funds terrorist prone areas. Relating to the speed of adjustment, the result shows that an approximate of 11% disequilibrium in oil revenue is corrected in the first quarter.

Table 6: VECM Result.

	ΔTOU	ΔTER	ΔOIL	ΔGDP	ΔFDI
$\Delta tou(-1)$	0.6571 (0.0064) *				
$\Delta tou(-3)$		-9.9789 (0.0961) ** *			

$\Delta tou(-4)$	$-0..6431$ (0.0014) *				
$\Delta tou(-5)$					-0.2046 (0.0254) *
$\Delta tou(-6)$		12.8521 (0.0784) *	0.3212 (0.0776) **		
$\Delta ter(-1)$		-0.6138 (0.0002) *			
$\Delta ter(-2)$		-0.7062 (0.0002) *			-0.0083 (0.0014) *
$\Delta ter(-3)$		-0.5525 (0.0057) *			-0.0060 (0.0288) *
$\Delta ter(-4)$				0.0003 (0.0226) *	-0.0068 (0.0115) *
$\Delta ter(-5)$					-0.0085 (0.0003) *
$\Delta oil(-2)$			0.4748 (0.0599) **		
$\Delta oil(-3)$		19.8253 (0.0036) *			
$\Delta oil(-4)$			-0.4983 (0.0067) *		0.3525 (0.0006) *
$\Delta gdp(-1)$		1150.325 (0.0202) **	31.9243 (0.0099) *	1.1280 (0.0003) *	
$\Delta gdp(-2)$		-1251.316 (0.0323) **	-37.9199 (0.0095) *		
$\Delta gdp(-3)$					8.0440 (0.0823) **
$\Delta gdp(-4)$				-0.4088 (0.0334) *	-19.6765 (0.0000) *
$\Delta gdp(-5)$				0.8947 (0.0134) *	
$\Delta gdp(-6)$			-29.8508 (0.0329) **		

$\Delta fdi(-1)$	$1.0854_{(0.0282)}^{*}$		$0.5780_{0.0358}^{**}$
$\Delta fdi(-4)$	$0.4307_{(0.0266)}^{*}$		$-0.3586_{(0.0010)}^{*}$
$\Delta fdi(-6)$	$-0.4126_{(0.0703)}^{*}$	$-0.0100_{(0.0766)}^{*}$	
ECM	$-0.1065_{(0.0097)}^{*}$		

For the sake of space, only significant values are reported. *, ** and *** denotes significance at 1%, 5% and 10% respectively.

Source: **Authors' Estimation.**

CONCLUSION AND IMPLICATIONS

This study delves away from the convention, particularly in the case of Nigeria, to look into the shock transmission among tourism, terrorism and some economic variables. Thus, the methodology remains valid in the context of this study. We used the vector autoregressive (VAR) technique on the Nigerian economy between the first quarter of 1995 to the last quarter of 2012, to capture the impulse response and also the variance decomposition among the variables. We made use of the Augmented Dickey-Fuller (ADF) unit root test to detect the stationarity properties of the variables, and also used the Johansen cointegration techniques to establish the long run relationship among the variables.

The result revealed that tourism reacts negatively, as expected, to terrorism, but responds positively to oil revenue. This denotes the fact that tourism receipt of the nation falls when terrorist activities increases, but increases positively along the same path with increase in oil revenue. The result of tourism's response to GDP and FDI shocks are mixed, denoting inconclusive dynamics in different quarters. In addition, we went ahead to look into the response of

tourism, GDP, oil revenue and FDI to a shock in terrorist attack. The result shows that they all respond negatively to a rise in terrorism, with greater fall coming from the GDP. This implies that a combined fall in other variables – tourism receipt, FDI and oil revenue - culminated in a greater fall in the GDP. Decomposing the effects among the series, a major finding reveals that over time, terrorism serves as major determinant of variations in other variables. Moreover,an economic boosting factor is the oil revenue. Joining these with the result of the impulse response, a conclusion cannot be far fetch; terrorism and oil revenue play major roles in determining variation in other factors.

A number of policy recommendations can be drawn from the findings. The oil industry and financial openness does not only directly impact on the GDP, but also indirectly impact the economy through the tourism industry. Meaning that apart from the direct revenue from oil, the oil sector may also boost other sectors of the economy. Thus, better policies guiding the oil sector and financial flows, will not only trigger economic growth, but also help in developing other sectors of the economy. In addition, more attention should be paid to combating terrorism, as its effect is not just a drag on the nation's growth, but on other sectors, as the empirical evidence indicated. It is also recommended that there is a need for the nation to diversify her economy because her oil revenue, which happens to dictate more of her total revenue, is susceptible to external shocks arising in part from terrorism activities at home and abroad.

There are a number of possible directions for future research that arise from some of the limitations of the present study. First, the availability of sufficiently long annual time series observations may not only be insightful to explore but will also obviate the need to statistically transform annual data to quarterly data as done presently. Second, beyond the VAR approach deployed in this paper, some alternative approaches such as threshold regression,

Computable General Equilibrium (CGE) modelling may be explored to better nuance the tourism-terrorism nexus for Nigeria.

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