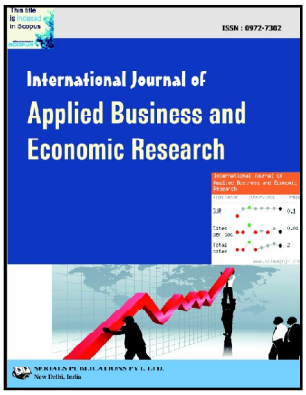

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The Terrorism Index Impact on Select Countries Economy

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Abstract: The present modern economy is having so many challenges in that global terrorism also playing vital role which is acting as a hurdle for the economic development. The present study has been focused on the four top countries, which are selected based on the ranking given by the economic and peace organization. The present study has been done from the year of 2005 to 2016. The Auto regressive distributed log methodology has been applied between GDP, Inflation and interest rates of Afghanistan, Iraq, Nigeria and Pakistan and found that Nigerian economy is not having the long run relationship with the terrorism index but other three countries are having. The Granger causality test results reveals on the Johensen co-integration and found that all the countries GDP growth rate got influenced by the terrorism index. This study is useful to the countries which are affected by the terrorism, exporters, importers, investors and governments.

Keywords: terrorism, GDP, Inflation and interest rates

1. INTRODUCTION

Terrorist attacks are geopolitical events that are believed to have an adverse effect on national and international economy. These attacks have direct and indirect financial consequences. Terrorism is a political issues nowadays, the stock exchange can be directly or indirectly affected by terrorism activity (IMF 2005). The terrorist attacks that have occurred in the past few years around the world have raised international awareness of the danger of terrorism and its complex repercussions on the financial markets.

Financial institutions could be involved in financial crime as victim, as perpetrator, or as instrumentality: Financial institutions can be subject to different types of fraud or abuse; they can directly commit financial crimes; or they can be used by third parties to commit crime (IMF, 2001a). Similarly, terrorism can have multiple implications for financial markets. First, as demonstrated by the attacks of September 11, 2001 on the World Trade Center financial markets can be, directly and indirectly, the victim of terrorism. Second, financial institutions can be specially set up to support terrorism. Third, financial institutions can be used, without their knowledge, to channel terrorist funds.

Globalization and open economies have resulted in markets that are interlinked by trade and financial channels. In the last few decades, there has been an increase in global trade (Arora and Vamvakidis, 2005).

2. NEED OF THE STUDY

Many countries like developed, developing and under developed nations are facing lot of problems and terrorism is one major problem the whole world is facing as of now. USA had experienced September 11, 2001 terrorist attack, UK, France, India, Bali, other terrorist attacks took place. The present study had considered only those countries which are ranked high and even their economy got influenced severely by the terrorism. The present study is made an attempt to explore how the selected countries economy got impacted by the terrorism.

3. SCOPE OF THE STUDY

The present study has been emphasized on top four ranked countries based on terrorism effect. In the study due to terrorism how respective countries economy got influenced. The period of the study has been considered from January, 2005 to December, 2016.

4. REVIEW OF LITERATURE

Berrebi and Klor (2005) focused specifically on attacks on Israeli companies and find that the abnormal stock returns in the US stock market for companies cross-listed for trading in the US to be - 0.77%. For companies in non-defense businesses the reactions were much higher at -4.58%, while defense related companies recorded a positive reaction of +3.89%.

Nguyen and Enomoto (2009) study the effect of terrorism on national stock indices and volatility, but only for two countries, Pakistan and Iran. Chen and Siems (2004) study the impact of terrorist attacks on national stock indices from 30 countries. They, however, focus on only two attacks, 9/11 and the Iraq invasion of Kuwait. Moreover, their primary focus was to understand the resilience of international stock markets. Chesney, Reshetar, and Karaman (2011) focus on Swiss (SMI), US (S&P 500), and European (MSCI Europe) stock indices. They concluded that the 77 terrorist attacks in their dataset had a significant negative impact on at least one of the three indices. Like some others, their results also indicate that terrorist attacks could have an impact on international markets. Arin, Ciferri, and Spagnolo (2008) show that for six different countries the stock markets show a negative return after the attacks. They also find that the magnitude of stock index decline is higher for emerging economies.

Panagiotis Lirgovas (2010) : further conducted a study on the impact of terrorism on Greek bank's stock with the help of an event study method. The study included the three major terrorist attacks: New York USA terrorist attack (Sep 9, 2001), Madrid train bombing (March 11,2004) and London train bombing (July 7, 2005). Nevertheless result of the study indicated that the 9/11 attack, London bombing and Madrid booming shows an abnormal, negative and no effect on Greek banks stock respectively. The 9/11 attack shows a huge and abnormal effect, because of the dominancy of the US economy over the world's economy. Our study's main concern is to identify the impact of terrorism activities on the KSE 100 index

Kollias *et al.* (2011), using event study methodology and GARCH family models, study the impact of the Madrid and of the London bombings on equity sectors. Significant negative abnormal returns are

widespread across the majority of sectors in the Spanish markets but not so in the case of London. Also the time of recovery is much faster in the latter case (the impact and volatility being in any case transitory), thus all results confirm those previously presented by Baumert (2010).

Evelita E. Celis and Leow Jia Shen (2015), found that the investors take asymmetric treatments to the election information and the government policy. In the twentieth century, intensive empirical studies of the events like terrorists attack and its impact on stock market became quite popular

5. OBJECTIVES OF THE STUDY

1. To measure the long run relationship of selected countries GDP, inflation and interest rates with country's terrorism index.
2. To measure the selected countries terrorism index impact on their GDP growth.

6. RESEARCH METHODOLOGY

The following statistical tools were applied on the secondary data.

ARDL: The auto Regressive Distributed Log methodology has been applied to know the long run association is there between the selected country's terrorism index with the selected economic factors.

Johensen Co-Integration: The Johensen co-integration test has been applied to know whether data is normally distributed between the selected economic variables and country's terrorism index.

Granger causality test: The Granger causality test will be applied on the Johensen co-integrated data. The GCT result will depicts the influence direction. The selected economic variables were getting influenced by the country's terrorism index.

Linear regression: Linear regression equation has been developed to know the terrorism index influence on the selected top four countries three economic factors (GDP, Inflation and Interest rates).

$$a - [\text{AFGTN}_{ti}] = [\alpha_1] + \text{AFGTN}_{gii}\,[\beta_1] + [U_1] \quad (1.1)$$

$$a - [\text{I}_{ti}] = [\alpha_1] + I_{gii}\,[\beta_2] + [U_2] \quad (1.2)$$

$$a - [N_{ti}] = [\alpha_1] + N_{gii}\,[\beta_3] + [U_3] \quad (1.3)$$

$$a - [PK_{ti}] = [\alpha_1] + PK_{gii}\,[\beta_4] + [U_4] \quad (1.1)$$

Where

AFGTN_{gii} - Afghanistan GDP, Inflation and Interest rate

I_{gii} - Iraq GDP, Inflation and Interest rate

N_{gii} - Nigeria GDP, Inflation and Interest rate

PK_{gii} - Pakistan GDP, Inflation and Interest rate

AFGTN_{ti} – Afghanistan terrorism Index

I_{ti} – Iraq terrorism Index

N_{ti} – Nigeria terrorism Index

PK_{ti} – Pakistan terrorism Index

7. DATA ANALYSIS

Table 1
Measure the long run relationship of selected countries GDP, inflation and interest rates with country's terrorism index

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-5.644361	4.68423	-1.204971	0.0514
D(AFGGDP(-1))	2.45074	2.604378	0.941008	0.00446
D(AFGGDP(-2))	1.426892	2.333484	0.611486	0.00031
D(AFGINFLATION(-1))	1.207617	32.09584	0.037625	0.00734
D(AFGINFLATION(-2))	29.33372	49.67491	0.590514	0.00147
D(AFGINTRATES(-1))	-61.74501	110.5024	-0.558766	0.00325
D(AFGINTRATES(-2))	-6.438302	67.21637	-0.095785	0.00324
D(AFGTI(-1))	-11.71015	12.35232	-0.948013	0.00432
D(AFGTI(-2))	-1.22297	10.44807	-0.117052	0.00175
R-squared	0.658084	Mean dependent var		-0.80364
Adjusted R-squared	-0.709579	S.D. dependent var		6.191246
S.E. of regression	8.095107	Akaike info criterion		6.952012
Sum squared resid	131.0615	Schwarz criterion		7.277563
Log likelihood	-29.23607	Hannan-Quinn criter.		6.746798
F-statistic	0.481174	Durbin-Watson stat		1.887321
Prob(F-statistic)	0.812446			

Source: Compiled through E-views version - 9

The table 1 of auto regressive distributed log methodology has been applied to measure the long run association between Afghanistan GDP, inflation and interest rates. The coefficient values are observed to be positive for GDP and inflation which indicates the no relation in long run but interest rates are having negative coefficient values means they have long run association with terrorism index of Afghanistan.

Table 2
Analysis of auto regressive for Afghanistan

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-23.38925	44.39375	-0.526859	0.0509
D(IRAQGDP(-1))	1.699983	1.530722	1.110576	0.03824
D(IRAQGDP(-2))	0.373255	2.138042	0.174578	0.01775
D(IRAQINFLATION(-1))	-885.2122	737.6596	-1.200028	0.00353
D(IRAQINFLATION(-2))	-401.4441	565.3228	-0.710115	0.01513

contd. table 2

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(IRAQINTRATES(-1))	485.8186	690.7036	0.703368	0.00547
D(IRAQINTRATES(-2))	819.8158	525.7148	1.559431	0.01592
D(IRAQTI(-1))	-94.01796	95.87006	-0.980681	0.01302
D(IRAQTI(-2))	34.48787	121.9906	0.282709	0.01804
R-squared	0.677973	Mean dependent var		-7.98546
Adjusted R-squared	-0.610136	S.D. dependent var		74.37728
S.E. of regression	94.37817	Akaike info criterion		11.86411
Sum squared resid	17814.48	Schwarz criterion		12.18966
Log likelihood	-56.25262	Hannan-Quinn criter.		11.6589
F-statistic	0.526332	Durbin-Watson stat		0.851491
Prob(F-statistic)	0.788724			

Source: Compiled through E-views version - 9

The above table 2 analysis of auto regressive distributed log methodology has been applied to measure the long run association between Iraq GDP, inflation and interest rates. The analysis results coefficient values observed to be positive for GDP and interest rates but inflation coefficient values are found to be negative. Hence it indicates that GDP and interest rates are not having long run association but inflation is having the long run association with Iraq terrorism index.

Table 3
Analysis of auto regressive for Nigeria

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-56.43269	142.19	-0.396882	0.0298
D(NGGDP(-1))	1.758519	2.497961	0.703982	0.01544
D(NGGDP(-2))	1.929577	2.479185	0.778311	0.00178
D(NGINFLATION(-1))	3467.852	4581.546	0.756917	0.03281
D(NGINFLATION(-2))	2004.557	4269.088	0.469552	0.00849
D(NGINTRATES(-1))	7346.163	8105.056	0.906368	0.01604
D(NGINTRATES(-2))	7836.556	8235.765	0.951527	0.02418
D(NGTI(-1))	-261.5225	270.6957	-0.966113	0.01359
D(NGTI(-2))	-246.7284	260.3384	-0.947722	0.00433
R-squared	0.402288	Mean dependent var		-15.1318
Adjusted R-squared	-1.988558	S.D. dependent var		193.3304
S.E. of regression	334.2189	Akaike info criterion		14.39308
Sum squared resid	223404.6	Schwarz criterion		14.71864
Log likelihood	-70.16197	Hannan-Quinn criter.		14.18787
F-statistic	0.168262	Durbin-Watson stat		1.313894
Prob (F-statistic)	0.973809			

Source: Compiled through E-views version - 9

The table 3 analysis of auto regressive distributed log methodology has been applied to measure the long run association between Nigeria GDP, inflation and interest rates. The coefficient values are observed to be positive in three economic variables. Hence the analysis result reveals that GDP, inflation and interests are not having long run association with Nigeria terrorism index.

Table 4
Analysis of auto regressive for Pakistan

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
C	-64.82376	94.23817	-0.687872	0.026
D(PKGDP(-1))	-0.470363	6.909602	-0.068074	0.01519
D(PKGDP(-2))	1.713975	4.888181	0.350637	0.03593
D(PKINFLATION(-1))	-162.3	1152.406	-0.140836	0.00009
D(PKINFLATION(-2))	-360.1013	1569.642	-0.229416	0.00399
D(PKINTRATES(-1))	164.9601	2396.043	0.068847	0.00514
D(PKINTRATES(-2))	1668.609	2541.713	0.65649	0.00789
D(PKTI(-1))	8.089645	213.1939	0.037945	0.00732
D(PKTI(-2))	87.35793	172.8441	0.505415	0.02635
R-squared	0.29716	Mean dependent var		-13.7627
Adjusted R-squared	-2.514199	S.D. dependent var		75.4988
S.E. of regression	141.5315	Akaike info criterion		12.67454
Sum squared resid	40062.35	Schwarz criterion		13.00009
Log likelihood	-60.70996	Hannan-Quinn criter.		12.46932
F-statistic	0.1057	Durbin-Watson stat		2.300299
Prob(F-statistic)	0.992202			

Source: Compiled through E-views version - 9

The above table 4 of auto regressive distributed log methodology has been applied to measure the long run association between Pakistan GDP, inflation and interest rates. The coefficient values are observed to be negative for GDP and inflation but interest rates are found to be positive for the Pakistan. Hence the analysis result reveals that GDP and inflation are having long run association with Pakistan terrorism index. The interest rates are not having long run association with terrorism index The selected countries terrorism index impact on their GDP growth.

The Johansen cointegration test has been applied on the unit rooted augmented dicky fuller tested observations. The log likelihood values are stated to be co-integrated between the variables of selected countries. Hence the analysis result reveals that the data is co-integrated and Granger causality test can be applied.

The table 5 of Granger causality test result reveals that the Afghanistan, Iraq, Nigeria and Pakistan countries terrorism index null hypothesis has been rejected because the p values are observed more than 0.05. The alternative hypothesis H1 has been has been accepted, hence the Afghanistan, Iraq, Nigeria and Pakistan gross domestic product got influenced by the country terrorism index.

Table 5
Granger causality test

Null Hypothesis:	*Obs*	*F-Statistic*	*Prob.*
DAFGTI does not Granger Cause DAFGGDP	13	0.63876	0.0427
DAFGGDP does not Granger Cause DAFGTI		0.91824	0.3605
DIRAQTI does not Granger Cause IRAQGDP	13	1.2038	0.0283
IRAQGDP does not Granger Cause DIRAQTI		1.21463	0.2962
DNGTI does not Granger Cause DNGGDP	13	0.61111	0.0125
DNGGDP does not Granger Cause DNGTI		0.6873	0.4264
DPKTI does not Granger Cause PKGDP	13	3.35924	0.0067
PKGDP does not Granger Cause DPKTI		3.16033	0.1058

Source: Compiled through E-views version - 9

Table 6
Linear regression analysis

Country Name	*GDP (Dependent variable)*	*Inflation (Dependent variable)*	*Interest rate (Dependent variable)*
Afghanistan	0.363	0.358	0.577
Iraq	0.658	0.471	0.634
Nigeria	0.291	0.496	0.047
Pakistan	0.384	0.288	0.137

Beta coefficient significant at 0.05

Source: Compiled through SPSS version - 20

Terrorism Index as Independent variable

The table of 6 linear regression analysis has been applied on the Granger causality tested result variables. The beta coefficient values indicated that Iraq country gross domestic product got highly influenced by the terrorism. Nigerian GDP also got influenced but impact of terrorism on GDP is low comparing with the other selected countries. Afghanistan interest rate beta coefficient reveals that terrorism got influenced high than the other selected countries. Nigerian inflation got severely got influenced by the terrorism during the study period.

FINDINGS OF THE STUDY

1. The study found that Afghanistan interest rates are having long run association with Afghanistan terrorism index.
2. It has been observed that Iraq inflation is having long run association but GDP and interest rates are not having long run relation with Iraq terrorism index.
3. Nigeria economic variables GDP, inflation and interest rates are not having long and short run association with terrorism index.

4. The study observed that Pakistan GDP and inflation is having long run relationship with terrorism index.
5. The study observed that the selected countries gross domestic product, inflation and interest rates were influence direction reflected by the Granger causality test due to terrorism index.
6. The linear regression beta coefficient value (0.658) reveals that the Iraq countries gross domestic product got highly influenced by the terrorism during the study period.
7. The study observed that the terrorism had slightly higher influence (0.496) on Nigerian inflation than the other selected countries.
8. The beta coefficient value of interest rate in Iraq (0.634) reveals that the terrorism influence is high comparing with the other selected countries.

9. LIMITATIONS OF THE STUDY

1. The present study has been confined to only four countries which were based on 2016 ranking given by the vision of humanity organization. There are many other countries which were deprived with the basic economic needs.
2. In the study only three economic factors were considered to analyse the terrorism impact on countries economic fundamentals (GDP, inflation and interest rate). These economic factors may not reflect the complete economic picture. There were many other economic factors, which may represent the actual economic fundamentals of the country.
3. The influence of the terrorism may have for long period. The present study has considered from 2005 year to 2016 year. The impact of terrorism which took place before 2005 year may have the effect during the study period. There were many other internal and external economic factors influence also be there on the selected countries GDP, inflation and interest rate along with the terrorism influence.

9. CONCLUSION

The study concludes for the titled "The terrorism index impact on select countries economy" for the period of 2005 to 2016. The study has been conducted on four top countries which are severely affected economically by the terrorism. The analysis depicts that Nigerian economy is not much influenced by the country's terrorism index. The Afghanistan, Iraq and Pakistan countries economy growth got affected by the terrorism. Hence there is a further scope to do research by considering the various economic factors of micro and macro level, so that how the international trade of these countries got affected can be identified.

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