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Terrorism and stock market development: causality evidence from Pakistan

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Abstract

Purpose – The aim of this paper is to explore the relationship between terrorist activities in Pakistan and the stock market development.

Design/methodology/approach – Using Terrorism Impact Factor (TIF), a unique score developed for this paper, an insight is provided into the causal relationship that exists between terrorism and Karachi Stock Exchange (KSE) index. Quantitative significance of the impact of terrorist activities on stock index is also discussed in the paper.

Findings – Through the empirics of the study, it is analyzed that terrorism negatively impacts stock market returns in the long run; whereas no significant relationship between stock market returns and terrorism is estimated in the short run.

Research limitations/implications – A potential limitation of the study was the constraint related to the available yearly economic growth and other economic variables' data. The TIF created for the study was based on the terrorist activities from 2001 to mid-2011 on an incident-to-incident basis. A yearly measure would have provided 11 data points for the study, which are considered insufficient for econometric analysis.

Practical implications – It is recommended that governments pay particular attention to economic recovery in the aftermath of terrorist attacks. Policies aimed at combating terrorism must be the priority of the government, so that its harm can be reduced, if not exterminated.

Social implications – Terrorism, with its all kinds of impacts, affects the society and its activities and therefore must be eliminated if an economy needs to prosper.

Originality/value – This study envisions the overall impact of terrorist activities, not just a single activity, on the health of the economy. For studying this impact, a Terrorism Impact Factor (TIF) scale has been developed for this study, based on the impact of each terrorist activity in the country.

Keywords Pakistan, Stock markets, Terrorism, Terrorism Impact Factor (TIF), Stock market development

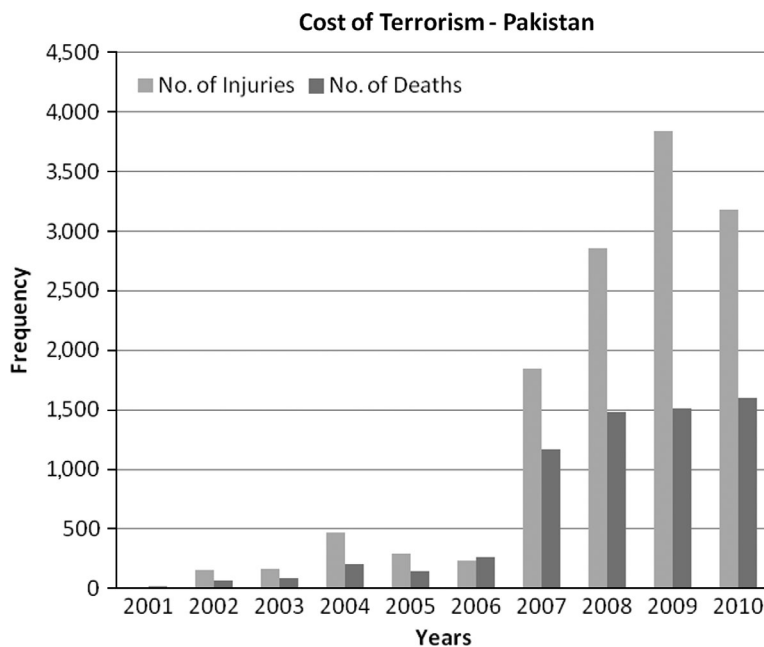
Paper type Research paper

I. Introduction

After the 9/11 attacks, Pakistan, being one of the foremost allies in the “war on terror”, paid a high price. For the last decade or so, Pakistan has been the major target of terrorist attacks. The number of terrorist activities in the country has risen from two in 2001 to 163 in 2010. Number of deaths and injuries owing to these terrorist activities in Pakistan are graphed in Figure 1.

The government has failed to analyze the situation and its intensity, in the true sense. Not much work has been done in order to investigate the root causes of terrorism and the refinement of the government stance and policies in this regard. Pakistan's economy





Notes: A major structural change can be seen between 2006 and 2007; the major reason for this change has been the extension of terrorist attacks into the major cities of the country; previously, terrorists mainly focused on tribal areas, Balochistan and Khyber Pakhtunkhwa provinces; but by 2007, the attack's focus was widened to Karachi, Lahore, Rawalpindi, Multan and other major cities of the country

Figure 1. Number of injuries and deaths owing to terrorism in Pakistan (2001-2010)

has been suffering and people of the country are being hard-pressed against inflation, unemployment, power losses and security concerns. At present, the news of a terrorist activity does not worry the un-affected people much because they are so used to such episodes.

This paper analyzes the impact of terrorism (through terrorism impact factor) on the country's stock market development, as stock market outlook presents a measure of the health of an economy. Using co-integration and causality tests, the short and long-run relationship between terrorism and stock prices has been investigated. Unlike Gaibulloev and Sandler (2009), this study incorporates terrorist activities that have taken place over the past decade. This provides us with an expanded range of time period to check if the impact of terrorist activities is consistent on the stock market development. Many past studies have used an event-study methodology to uncover the impact of terrorism on the stock markets (see, for example, Burch *et al.* (2003) considering 9/11 attacks on US; Johnston and Nedelescu (2005) considering 9/11 US attacks and 2004 Madrid attacks). The present study envisions the overall impact of terrorist activities, not just a single activity, on the health of the economy. For studying this impact, a terrorism impact factor (TIF) scale has been developed for this study, based on the impact of each terrorist activity in the country. Using this unique dataset of terror attacks, this study aims at answering the following questions:

- Do terrorist attacks impact the stock market?
- Is the impact present in the short-run or the long-run?
- What is quantitative importance of the results obtained?
- What are the policy related lessons for the government in this regard?

The rest of the paper is structured as follows: Section II gives review of the literature. Section III aims at theoretical considerations and hypotheses development. Section IV discusses the methodology of the TIF scale. Section V presents the methodology and data details. Section VI provides the empirical analysis while Section VII concludes the paper.

II. Literature review

Terrorist activities impact the infrastructure and systems of a country. Also, investor moods and interests are diverted by such activities. In turn, stock markets, measuring the health of an economy, are also affected. Johnston and Nedelescu (2005) studied two cases of terrorism, 9/11 attacks on the US and 2004 Madrid attacks; and concluded that terrorist activities cause heavy damage to property and other systems including communication. This, in turn, forces investors into a defensive mood where they are reluctant to invest due to the prevailing uncertainty. Terrorism affects economic prosperity, whereas, economic prosperity and increasing development levels in a country may hamper terrorist activities (Lai, 2007; Freytag *et al.*, 2012). This motivation leads into a two-way analysis for this study where the bi-directional relationship between terrorism and stock market development needs to be looked at. There is also a growing body of literature which, arguably, points out that terrorist activities do not impact developed countries much. Gaibulloev and Sandler (2009) used one-year panel analysis and indicated that terrorism significantly retards growth in the short-run for Asian developing countries. They also noted that this effect is not present for the Asian developed countries. Abadie and Gardeazabal (2003) approximated a 10 percent decline in per capita income for Basque region of Spain due to ETA's terrorist movement. According to Sandler and Enders (2008), stable and developed economies exhibit lesser reactions to terrorist activities. Karolyi and Martell (2005) examined the long-term impact of terrorism on stock prices and found that the impact was not consistent. They indicated that wealthier and democratic countries show greater reaction in their share prices in response to terrorist activities.

Eldor and Melnick (2004) researched Israeli stock and foreign exchange markets' response towards the 639 terror attacks during 1990-2003. Their findings suggest that terrorism has a negative impact on stock markets. However, they did not find support for the effect of terrorism on foreign exchange markets; due to the efficient nature of these markets in incorporating news about such violent episodes. Based on the findings of Eldor and Melnick (2004), this study is also motivated of the negative relationship between stock market development and terrorism.

According to Shiller (2003), terrorism potentially affects investors' sentiment and thereby generates a negative impact on the stock prices. Burch *et al.* (2003) considered 310 US based closed-end funds and tried to analyze the investors' reaction to the 9/11 attacks. An over-reaction was recorded in the first week after the attacks but it then converted into under-reaction in the next two weeks. A similar pattern of investor behavior has been documented by Kallberg *et al.* (2008) who studied the response of New York real estate investment trusts to the 9/11 attacks. A positive trend to begin

with, converts into a downward trend in the weeks to follow. Cummins and Lewis (2003) found a significant negative reaction to the 9/11 attacks for 43 property-casualty insurers, by analyzing their returns. Overall, there is a general consensus that a negative relation holds between stock market returns, through investors' reaction, and terrorist activities. These reactions directly impact the stock prices and with the passage of time, their impact diminishes.

The above literature (studying the impact of terrorist activities on stock market) indicates a strong impact of terrorism on stock market development, where most of the researchers find a definite shift in the investors' moods due to a terrorist activity creating a negative reaction as recorded in the above studies. The present study adds to the above strand of literature by examining the results of, for example, Gaibullov and Sandler (2009) who were convinced of the short-run impact of terrorism on growth for Asian developing countries. Also, this paper investigates the reverse impact of stock market development on terrorist attacks, i.e. the reverse causality.

III. Theoretical consideration and hypotheses

Our basic study model is given in the equation (A) below:

$$x_t = x_{t-1} + y_{t-1} + \mu_t \quad (A)$$

Where, x_t represents the logarithmic function of stock market Karachi Stock Exchange (KSE) 100 index and y_t represents the TIF. Augmented Dickey Fuller (ADF) test in Table III confirms the $I(1)$ nature of both the series. Residual term μ_t is the white noise innovation.

A shock to the system impacts all the agents interacting in it. A terrorist activity, by impacting the moods and behaviors of the people, creates a realistic hype in the general investors who do not find it safe to invest further, at least for some period of time. This, in turn, impacts the stock index. Therefore, there exists a relationship between terrorist activities and the stock market. The study is motivated of the existence of a negative relationship between the TIF and stock market development; the higher the TIF score is, lower would be the stock market returns. For equation (A), if the coefficient of the independent variable is significant, we can assume that there exists a relationship between the stock markets and terrorist activities. To test the short-run and long-run causal relationship between the two variables, equation (A) is first-differenced and transformed into equation (B) as:

$$\Delta x_t = \Delta x_{t-1} + \Delta y_{t-1} + \mu_t \quad (B)$$

Error correction mechanism is adopted in this study to unleash the short and long-run causalities between the two variables.

Our main hypotheses for the study are:

- H1.* There exists a relationship between stock index and TIF.
- H2.* There is a short as well as long-run relationship between terrorism and the stock index.
- H3.* The impact of terrorism on stock index is quantitatively relevant and significant.

IV. Terrorism impact factor

Literature contains numerous studies on terrorism in which researchers adopt event-study methodology (Abadie and Gardeazabal, 2003; Chen and Siembs, 2004) to study the impact of terrorist activities on stock market development. In such studies, the impact of a terrorist activity is considered by analyzing the deviations of returns from their previous values. In the present study, the conventional event-study methodology was not preferred; instead an index was constructed called the terrorism impact factor. This index, different in attributes from other existing terrorism databases[1], considers the impact of each terrorist incident in the country and based on the intensity of the event awards a score to it. Also this methodology allows for the time-series analysis of terrorism and stock prices. Previous attempts at forming an index for the terrorist activities do not focus on a comprehensive list of “impact factors” (TIF1-TIF9 in this study) that are directly related to a terrorist activity. Also, prior attempts in this regard have not awarded scores to each terrorist activity based on the impact it created (e.g. in the case of Eldor and Melnick (2004)).

For the purpose of constructing an index, all (major) terrorist activities that have taken place from 1 January 2001 to 30 June 2011 are listed. 452 events are recorded for the mentioned time period. Sources of data for these incidents are leading newspapers of Pakistan (*Daily Jang*, *The News* and *Dawn*). These newspapers are reliable sources of information in Pakistan and to ensure consistency only those events are reported which were included in all the three major newspapers mentioned above. These events are also counterchecked for accuracy of figures from world wide web sources[2]. After listing all the terrorist events, each event is checked on nine different sub-scores (factors). Following table lists the nine areas for sub-scores of each event.

Factors TIF1-TIF9 are expected to capture the major impacts of a terrorist activity. A terrorist activity resulting in the death or injury of a political figurehead may incite the followers to start riots, etc. (event like the death of former Prime Minister Benazir Bhutto) and cause a serious harm to the economic and financial activity[3]. A suicide attack creates a sense of insecurity among the general public and people start avoiding indulging in purchasing and other outside activities; thereby creating a major setback to the financial activity. All other factors are also relevant and are anticipated to have a strong impact in Pakistani context.

Checking each event for the factors TIF1-TIF9 using the framework given in Table I, nine factor scores are constructed for each event. All these factors covering the whole time period are then entered into a principal component analysis (PCA) in order to get a unique index score for each factor. PCA is a multivariate statistical analysis technique which shrinks large number of variables into some reduced dimension(s). Generally, for variables ranging from a_1 to a_n , the following equation represents the estimation of the principal component:

$$\begin{aligned}
 PC_1 &= \alpha_{11}a_1 + \alpha_{12}a_2 + \alpha_{13}a_3 + \cdots + \alpha_{1n}a_n \\
 &\vdots \\
 PC_k &= \alpha_{k1}a_1 + \alpha_{k2}a_2 + \alpha_{k3}a_3 + \cdots + \alpha_{kn}a_n
 \end{aligned}$$

where, a_{kn} represents the weight for the k th principal component and the n th variable.

Code	Description	Points
TIF1	Deaths	1 point for every ten dead people
TIF2	Injuries	1 point for every 20 injured people
TIF3	Assassination of a Pakistani high-profile figure (politician, high-rank officer, religious leader, etc.)	0 for no and 1 for yes
TIF4	Attack on a Pakistani high-profile figure but not killed	0 for no and 1 for yes
TIF5	Suicide attack	0 for no and 1 for yes
TIF6	Attack in a major city (Karachi, Lahore, Islamabad, Peshawar, Quetta)	0 for no and 1 for yes
TIF7	A major attack on forces (army, navy, air force, police, etc.)	0 for no and 1 for yes
TIF8	Attack on foreigners/consulate/embassy	0 for no and 1 for yes
TIF9	Attack on foreign delegate (large scale) especially sports delegate	0 for no and 1 for yes

Notes: These factors TIF1-TIF9 are considered on the basis of their direct relationship with a terrorist attack; these factors directly influence the people's reaction to such events; factors like capital flight, government destabilization and market disruption, etc. are inarguably, relevant to a terrorist activity; but are not directly conceived by a common man because of their indirect impact; lives of people are always valued more and therefore in the present analysis, the number of casualties receives more weight (10:1) than the number of injuries (20:1); since, it has been observed that the injuries carried due to terrorist activities may be severe (sometimes resulting in permanent disability or ultimately resulting in casualty); therefore, a compatible score has been awarded to injuries as compared to deaths

Table I.
Terrorism impact factor
methodology

The ordering of the components is adjusted in a manner that the first principal component PC_1 explains the maximum amount of variation in the data. All subsequent principal components show lesser variation than the first one.

Based on the index scores for each factor by using first extracted principal component method[4], following equation is estimated for establishing a TIF score for each event[5]:

$$\begin{aligned} \text{TIF} = & 0.613254*\text{TIF1} + 0.636135*\text{TIF2} - 0.091349*\text{TIF3} - 0.023802*\text{TIF4} \\ & + 0.341171* \text{TIF5} + 0.010304*\text{TIF6} + 0.288032*\text{TIF7} \\ & - 0.079329*\text{TIF8} - 0.067681*\text{TIF9} \end{aligned} \quad (1)$$

This forms a "Daily TIF Index", which gives a unique score to each day on which the terrorist activity took place. The TIF index includes the domestic terrorist activities as well as attacks on foreigners (transnational) that have taken place during the time period under consideration.

V. Methodology and data

This paper hypothesizes the motivation that a terrorist activity in Pakistan (or any other country for that matter) affects the country's stock market development. For the purpose of establishing the relationship between terrorism and stock market development, causality evidence was studied between them. Engle-Granger method (Engle and Granger, 1981) was employed in this regard. Stationarity of the series was checked using ADF (Dickey and Fuller, 1981) tests. Because the study employs daily data, therefore, there may have been instances of structural breaks. In order to check for this issue,

this study also utilizes the Clemente-Montanes-Reyes unit root test with additive (AO) and innovative outliers (IO) models for the presence of two structural breaks. The direction of causality was estimated using error correction model as follow:

$$\Delta SPrice_t = A_{11}(L)\Delta SPrice_{t-k} + A_{12}(L)\Delta TIF_{t-k} + \delta_{SPrice}ECT_{t-1} + \varepsilon_{1t} \quad (2)$$

$$\Delta TIF_t = A_{21}(L)\Delta TIF_{t-k} + A_{22}(L)\Delta SPrice_{t-k} + \delta_{TIF}ECT_{t-1} + \varepsilon_{2t} \quad (3)$$

where:

- $SPrice_t$ and TIF_t correspond to stock prices and terrorism impact factor, respectively.
- Δ represents the difference operator and k is the lag length.
- A_{ij} represents polynomials in the lag operator (L).
- ECT refers to the lagged error correction term derived from long-run co-integrating relationship.
- ε_t represents the error correction terms (uncorrelated and random with a zero mean).
- δ represents the deviation of the dependent variable from long-run equilibrium.

If the variables are co-integrated, then at least one or both of the error correction terms should be non-zero. Causality was checked by using simple t test of δ , joint Wald F -test of the significance of each explanatory variable's sum of lags and a joint Wald F -test of (δ_{SPrice} and A_{12}) and (δ_{TIF} and A_{22}).

Daily time-series data was used (1 January 2001 to 30 June 2011) for TIF index and stock prices. Stock prices[6] are of KSE 100 index (closing prices) and are used in logarithmic form. The graph of stock price index is shown in Figure 2.

However, a specific day's TIF score should be compared to the following day's stock price. Therefore, the stock prices variable was used in a lead. Descriptive analysis of the variables used in the study is presented in Table II.



Figure 2.
Stock price index
(2001-2010)

VI. Empirical findings

VI.A. Unit root tests

The results of ADF test performed for unit root specification indicates that both the variables are integrated of the order $I(1)$ at 1 percent significance level[7]. Results of the Clemente-Montanes-Reyes unit root test also confirmed the $I(1)$ nature of the two series. Tables III and IV represent the results of the two unit root tests.

VI.B. Co-integration tests

Since both the variables are integrated of the order $I(1)$, therefore there may exist a case of co-integration. This co-integration was tested by using Johansen's procedure (Johansen, 1988; Johansen and Juselius, 1990) as shown in Table V.

Variables	Mean	SD	Minimum	Maximum
SPrice	3.592	0.178	3.122	4.195
TIF	2.043	2.980	-0.030	29.464

Table II.
Descriptive analysis

Variables	Augmented Dickey-Fuller test	
	$I(0)$	$I(1)$
SPriceTIF	1.361	-5.869*
Critical values (%)	-1.513	-10.441*
1	-2.570	
5	-1.942	
10	-1.616	

Notes: *Rejection of the null hypothesis of non-stationarity at 1 percent level; lag length was determined using Akaike information criterion (AIC)

Table III.
Unit root test results

	<i>t</i> -stat.	Innovative outliers			<i>t</i> -stat.	Additive outliers		
		TB1	TB2	Decision		TB1	TB2	Decision
<i>SPrice</i>	-5.36	7 October 2007	9 April 2008*	$I(1)$	-3.93	19 March 2005	2 June 2008*	$I(1)$
<i>TIF</i>	-2.11	12 October 2007	2 August 2008	$I(1)$	-2.45	1 October 2007	29 July-4 August 2008	$I(1)$

Notes: Significance at: *5 percent level

Table IV.
Clemente-Montanes-Reyes unit root test results

Null hypothesis (no. of CE)	Eigenvalue	Test statistics ^a	5% critical value
None	0.165	80.565*	14.265
At most 1	0.041	18.541*	3.841

Notes: Significance at: *5 percent level; ^atest statistics are maximum eigen-statistics

Table V.
Results of Johansen co-integration test

For both the variables, the null hypothesis of no co-integration is clearly rejected at 5 percent level against the alternative of the existence of two co-integration relationships between the two variables. Hence, our *H1* is validated that there exists a relationship between terrorism (TIF) and stock index. This indicates that causality can now be studied between the variables.

VI.C. Error correction mechanism and direction of causality

For finding the direction of causality between the variables, error correction terms were included in the respective equations. This error correction mechanism allows us to find short and long-run causalities between the variables.

Table VI presents the results of causality analysis for equations (2) and (3). Terrorism impact factor has no short-run causality associated with stock market returns in either direction. In the long-run, TIF causes stock markets returns with a negative association. Our *H2* was partially validated as there is a long-run relationship between stock index and terrorism only. This asserts the point that in the short-run, terrorism might not exhibit significant deviations in the stock market returns; but in the long-run, the effects are clearly noteworthy. Our finding of the negative association of terrorism with stock returns are consistent with the findings of Eldor and Melnick (2004), Johnston and Nedelescu (2005) and Shiller (2003) who also reported similar results.

VI.D. Quantitative importance of the long-run impact

From Table VII, it is clear that terrorist attacks in the country had significant impact on the stock index; validating the *H3* of our study. Eight major terrorist incidents are reported in the table where huge losses of lives (along with injuries) were sustained.

The greatest slump in the index, that is -10.21 percent, is recorded for the attack on Benazir Bhutto (two time prime minister of Pakistan) convoy in Karachi that saw 139 deaths and 450 injuries. The decline in the index continued for a period of about one month. Second most significant downward trend was observed for a period of 22 days on the assassination of Benazir Bhutto where the intensity of the decline was measured to be -1.45 percent. Suicide attack in Lahore recorded a slump of -4.60 percent in the index, followed by decrease of -2.76 percent as a result of the car bomb attack in Peshawar. Lowest decline in the index was reported for the twin blasts in Karachi in 2010 where the downward trend continued for five days and the intensity of the trend was recorded to be -0.77 percent.

VII. Conclusion

The main purpose of the study was to establish a relationship between terrorism and stock market development. Pakistan was chosen as the study-case because of the

Dependent variable	Short-run effects		Vector error correction model (VECM) estimation ECT ^a
	Δ SPrice	Δ TIF	
Δ SPrice	–	1.846	-13.916^*
Δ TIF	1.962	–	0.323

Table VI.
Causality estimation
results

Notes: Significance at: *1 percent level; ^aECT refers to the error correction term; lag length was selected using AIC

Event	Deaths	Injuries	Event date	Impact continuation date	Impact period	Percentage change in index
Attack on Benazir Bhutto's convoy in Karachi	139	450	18 October 2007	17 November 2007	One month	-10.21
Benazir Bhutto's assassination in Rawalpindi	31	100	27 December 2007	17 January 2008	22 days	-1.45
Suicide attack near CCPO and ISI offices in Lahore	27	326	27 May 2009	14 June 2009	19 days	-4.60
Car bomb attack in a market in Peshawar	118	200	28 October 2009	10 November 2009	14 days	-2.76
Suicide attack on ISI headquarters in Peshawar	25	82	13 November 2009	17 November 2009	Five days	-1.71
Attack on friday congregation in Rawalpindi	40	86	4 December 2009	8 December 2009	Five days	-0.97
Twin planted blast in Karachi	25	100	5 February 2010	9 February 2010	Five days	-0.77
Twin suicide attacks in Lahore	45	100	12 March 2010	21 March 2010	Ten days	-1.24

Table VII.
Quantitative impact
of terrorist attacks

increasing number of terrorist activities in the country and Pakistan's significant role in the war against terrorism. Co-integration and causality evidence was recorded for the relationship between the variables.

No short-term impact of terrorism on stock market returns (or vice-versa) was recorded in the analysis. However, terrorism was found to negatively influence stock returns in the long-run. This indicates that terrorist activities change the investor moods to a large extent in particular and shift the economic outlook of the country in general. Therefore, it can be said that terrorist activities are major set-backs to the health and development of the economy. Pakistan has been a major subject of terrorist activities in the last decade or so. Enormous number of such activities has now reduced its impact on the minds of the people and their behavior is not much affected by these activities in the short-run. However, in the long-run, these activities impact the overall economy in terms of lesser participation from the drivers of the economy (both domestic and foreign). In order to ascertain the participation of all the agents, it is necessary that the government must provide security to businesses and should improve on the overall well-being of the general public.

The empirical findings of this research can have useful policy implications for Pakistan and its policy makers. More sincere efforts are needed to combat terrorism and associated activities on the part of the government elites, since such activities induce vulnerability in stock market prices in specific and stock market development in general. Having shown with systematic evidence that terrorism has negative economic externalities, and based on the literature showing that poor economic conditions are linked to a wide array of socio-political problems (including terrorist activities); it is recommended that governments pay particular attention to economic recovery in the aftermath of terrorist attacks. Policies aimed at combating terrorism must be the priority of the government so that its harms can be reduced, if not exterminated. Terrorism, with its all kinds of impacts, affects the society and its activities and therefore must be eliminated if an economy needs to prosper.

Future research should be directed at finding the impact of government expenditure, budgetary allocations, financial borrowings, inequality and inflation on terrorism in Pakistan in order to evaluate the roots of terrorism. Also the impact of terrorism on the economic growth, foreign direct investment and inflation may be studied in the Pakistani context. Using natural disasters as a control in future studies may enhance the understanding of terrorism and its role in financial development. A potential limitation of the study was the constraint related to the available yearly economic growth and other economic variables' data. The TIF created for the study was based on the terrorist activities from 2001 to mid-2011 on an incident-to-incident basis. A yearly measure would have provided 11 data points for the study which are considered insufficient for econometric analysis.

Notes

1. ITERATE and GTD terrorism databases are two of the main data stores of terrorism incidents. Global terrorism database (GTD), one of the most comprehensive database on terrorist events around the world, provides information about the date and location of the incident, weapons used in the attack, nature of the target, the number of casualties and the responsible group/individual. GTD contains more than 80,000 cases of terrorism between the years 1970 and 2007. ITERATE data base, another comprehensive source of terrorist incidents, also records fields like type of attack, location, casualties, fatalities, etc. This paper's proposed TIF is different from ITERATE and GTD in the sense that it is not just a database of terrorist events in Pakistan but it awards a score (the impact factor) to each event based on the analysis of the impact that a terrorism event has created.
2. The world wide web sources included: http://en.wikipedia.org/wiki/List_of_terrorist_incidents_in_Pakistan_since_2001; http://san-pips.com/index.php?action=reports&id=psr_1; www.satp.org/satporgtp/countries/pakistan/database/index.html
3. For reference, see www.telegraph.co.uk/news/worldnews/1573789/Pakistan-faces-horror-of-civil-war-after-Benazir-Bhutto-is-assassinated-in-suicide-attack.html; www.pressherald.com/archive/riots-follow-bhuttos-death_2007-12-28.html
4. Researchers like Filmer and Pritchett (2001) and McKenzie (2003) have used additional components apart from the first extracted component and concluded that the use of first principal component is justified, where its results are also robust to including additional components.
5. The above weights can be justified for their indicated signs. A terrorist attack (a planted or a suicide attack) causing deaths and/or injuries is considered as a major set-back by the general public and thereby receive higher scores in the TIF (TIF1, TIF2 and TIF5). The miseries of the general public, in relation to these terrorist attacks, are considered (by general public) to be the outcomes of wrong (thought to be) policies of the government and military officials and therefore, an attack launched on them may not raise many eye-brows. This is the reason for the negative weights for TIF3 and TIF4. Attack in a major city and attack on forces (mostly low raked personnel) also receive sympathetic response and induce people into a defensive mood thereby validating the positive weights for TIF6 and TIF7. Foreigners, especially, Americans, etc. are not welcomed by the masses in Pakistan in relation to their government's stance on drone attacks and their policies related to Pakistan and Afghanistan; therefore an attack on a foreigner may not highly impact the general public of the country, thereby indicating a negative weights for TIF8 and TIF9.
6. For a terrorist activity to continue for more than one day, the average of stock prices of all the days of the activity was taken.
7. Lag length was selected using AIC.

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