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Terrorism and Stock Market Linkages: An Empirical Study from Pakistan

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Abstract

This paper investigated the impact of prolonged terrorist activities on stock prices of different sectors listed in Karachi Stock Exchange by using newly developed terrorism impact factor index with lingering effect (TIFL) and monthly time series data from 2002(Jan) to 2011(Dec). Johansen and Juselius cointegration revealed long run relationship between terrorism and stock price. Normalized cointegration vectors are used to test the effect of terrorism on stock price. Results demonstrated significantly mixed positive and negative impact of prolonged terrorism on stock prices of different sectors and have shown that market has not become insensitive to the prolonged terrorist attacks.

JEL classification codes: G01, G11, G12, G15, G32

Key words: Prolonged Terrorist Attacks, Financial Risk, Financial Markets, Stock Price

1 Introduction

After the 9/11 attacks, globally terrorist activities have increased by 23% per year (GTD, 2013). Pakistan has paid a very high price for being a front line ally in “War on Terror” and the people of Pakistan have been the main target of terrorist attacks. Since joining of Pakistan in “War on Terror”, terrorist activities in the country have escalated many fold. According to GTD since January 1, 1991 till December 31, 2011 there had been 5211 terrorist attacks out of which there had been 1610 terrorist attacks till before 9/11 and after 9/11 till December, 2011 there had been 3601 terrorist attacks in Pakistan. Government has not paid enough attention to resolve the root causes of terrorism, resulting in a stress on Pakistani economy and people of the country (Shahbaz, 2013).

As terrorism is a tactic designed to set in oppressiveness and fear aimed to attain a religious, political, economic, or social objective. It is defined as an action with a purpose with focused

Table 1: Terrorist Events, 2002(Jan) to 2011(Dec)

<i>Year</i>	<i>Rank</i>	<i>Incidents</i>	<i>Fatalities</i>	<i>Injuries</i>	<i>Property Damaged</i>
2002	11	40	96	310	13
2003	10	29	119	181	10
2004	5	58	270	658	17
2005	7	65	78	257	32
2006	5	144	244	579	55
2007	2	196	1144	1983	72
2008	2	491	1008	1739	157
2009	2	650	1377	3417	308
2010	2	682	1519	2865	345
2011	2	910	1468	2459	458

on explicit targets spread over numerous geographical locations and are highly unpredictable. Unlike other disasters where the predictions for the occurrence of such events are possible there is a very little possibility of predicting terrorism; predominantly comprising the use of explosives and the firearms . Moreover the reaction time after identification of a potential terrorist event is substantially limited as compare to other disasters. This innate suddenness of terrorist events may initiate societal reaction by disrupting markets.

The act of terrorism on the target population and its impact on its economy has not been consistent or straightforward in instilling fear and uncertainty in the besieged population. Investors' confidence and financial market instability has been used widely as an indicator of fear owing to terrorism. (Eldor & Melnick, 2004; Arin, Ciferri, & Spagnolo, 2008; Shahbaz, Shabbir, Malik, & Wolters, 2013). The terrorist attack of 9/11 on World Trade Center, the financial and economical hub of the United States has been successful in short-term terror objectives and New York Stock Exchange (NYSE) trading operations remained inactive for whole week till 17 September and in the intervening week the Dow Jones fall by 14 percent(Lenain, Bonturi, & Koen, 2002).

Similarly when terrorist attacked in Bali island on 12 October, 2002 through suicide bomber and a car bomb and killed 202 people mostly tourist and injured 240. Indonesia stock market noted consistent negative impact on the first trading day and it dropped by 25.53%. The sector analyses showed that on the first day of trading the investors' capital reduced between 3.28% and 8.39% and remain persistently negative for five days (Ramiah & Graham, 2013).

In contrast, on 7th July 2005 early morning; when terrorists steered multiple bombings in London killing 52 civilians and injuring over 700, the worst terrorist incident in the history of United Kingdom since 1988 Lockerbie bombing and first ever suicide attack in the country, the London Stock Exchange (LSE) somewhat remained uninterrupted, besides, initial decline in

FTSE 100 (London stock index) to approximately four percent, it adjusted to the shock and trading continued to closed down to only 1.6 percent. The varying reactions of the LSE and NYSE encourage to inquire whether terrorism impact financial markets or they are relatively insensitive to terrorist incidents. Moreover, if financial markets are sensitive to act of terrorism, are the effects momentary?

These studies suggest that the fear of terrorism can inhibit investors from making investment decision freely and societal confidence gets weaken. It also follows, that when terrorism becomes a frequent part of the environment, investor confidence may not be affected and market continued function normally. Consequently, fear from terrorism wear away when it becomes a routine element over time and financial traders discounted in financial markets. Effects of ongoing terrorism on the economy of a country were assessed in numerous studies Shahbaz (2013); Alam (2013); Suleman (2012); Arin et al. (2008); Eckstein and Tsiddon (2004); Eldor and Melnick (2004); and have revealed immediate daily reaction of financial markets to the act of terrorism. Whilst negative effects have been associated with a single terrorist act, answer to the significance of prolonged terrorism involving mass casualty are less clear. Societal adaptation to a man made disaster (terrorism) or natural disaster, may lead to the “normalization” of routine life and subsequent recovery of economic decision making. This paper seeks answer to the following questions.

- RQ1: What are the of consequences of prolonged terrorism on stock markets?
- RQ2: Do terrorist attacks have an industry differential effect?

2 Literature Review

Since the involvement in “War on Terror” the gravest problem Pakistan is facing; is terrorism. Since 9/11 till Dec,2011 there had been 3601 terrorist attacks including all types (GTD,2013). These attacks have directly damaged the economy of the country by dropping FDI, threatening the confidence of domestic investors, and upsetting financial markets, successively in lowering economic growth, increasing unemployment and further poverty (Shahbaz, 2013)

Alam (2013) explore the relationship between terrorist activities in Pakistan and the stock market movement by using “Terrorism Impact Factor”, developed to study the overall impact of

terrorist activities, rather than an event study. No significant relationship found between stock market returns and terrorism in the short run however in long run terrorism impact negatively on stock returns.

Aslam and Kang (2013) using KSE-100 index time series daily data and terrorist attack news spanned over year 2000 to 2012 investigated the affect of 300 terrorist attacks on stock market of Karachi-Pakistan . Results indicate that the terrorist attacks have significant negative effects on KSE-100 index on the day of attack and one day before the attack however this effect is short lived. Empirical findings also indicated that the impact of attack varied across locations, types and severity of attacks.

Essaddam and Karagianis (2013) investigated the affect of terrorism on stock return volatility of American firms targeted by terrorist attacks. Act of terrorism was identified as an important risk factor in explaining the volatility of stock returns. Using an event-study approach and bootstrapping technique it was found that volatility increases on the day of the attack and remain significant for at least fifteen days following the day of the attack showing lingering effect. This effect differs according to the country characteristics in which the incident occurred. It was also found that firms operating in wealthier, or more democratic countries, face greater volatility in stock returns relative to firms operating in developing countries.

Ramiah and Graham (2013) using event study methodology probed how Indonesian equity market reacted to the terrorist attacks on USA (9/11), London (7/7), Spain, India and even Indonesia. Results show that equity portfolios were adversely affected by the September 11 attacks and Bali bombings. Domestic terrorist attack also had negative impact on Indonesian capital market where as no significant impact of London, Madrid and Mumbai terrorist attacks on Indonesian capital market were noted.

Graham and Ramiah (2012) used an adaptive expectations hypothesis and event study methodology to estimate the impact of five terrorist attacks (9/11, Bali, Madrid, London and Mumbai) on all sectors listed in Japanese stock markets. Parametric and non-parametric tests were used to investigate whether the systematic risk and returns were affected by these events. In general increase in systematic risk of some Japanese industries were documented whilst strong negative impact on returns were recorded for most of the industries on the first day of trading following the 9/11 attacks.

Chesney, Reshtar, and Karaman (2011) investigated the impact of 77 terrorist events that happened in 25 countries on their financial market indices. Twelve years financial market's daily price Indices starting from 4 Jan, 1994 till 16 Sep, 2005 was used and behavior of stocks, bonds and the commodity market was analyzed using an event-study approach. They find terrorist attacks significantly affect European, American, Swiss, and global markets. Along the same line Kollias, Papadamou, and Stagiannis (2011) used event study methodology to examine the impact terrorist attacks of March 11th, 2004 in Madrid and July 7th, 2005 in London; the two major terrorist events on three major stock exchanges is Spain (Madrid, Valencia and Barcelona) and the London stock exchange. Empirical findings point to similar reactions on the event day, but noted significantly different recovery periods (in days) are needed for stock markets to rebound and further the negative effects were short-lived.

Drakos (2010) examined whether terrorism exerts a significant negative impact on daily stock market returns in a sample of 22 countries. In contrast to previous research which focused on selected major terrorist acts, it tested for overall terrorist activity, it also explores whether this effect is a function of the level of psychosocial impact caused by terrorist incidents. The results supported negative returns on the day of a terrorist attack, which further amplify with the increase in psychosocial effects.

Broun and Derwall (2010) examined the effects of major significant terrorist attacks on stock markets of major economies of the world. Using event study method their analytical results suggested that terrorist attacks effect stock prices mildly negative. They compared these price reactions to those from natural unanticipated disaster, earthquakes, and concluded that price declines following terror attacks are more pronounced. However, in both cases it bounced back within a first week of the aftermath. Comparison of price responses of different industries showed different reactions and were strongest for the local markets. Results suggested that financial industry reacted strongly to terror events but recovered swiftly except for 9/11 attacks which caused long-term effects on financial industry.

Ramiah, Cam, Calabro, Maher, and Ghafouri (2010) investigated the impact of five terrorist attacks (9/11, Bali, Madrid, London and Mumbai) on different sectorial equities listed on the Australian Stock Exchange. Significant short term negative abnormal returns reported around the 9/11 attacks and to a lesser extent, the Madrid and London bombings. Further weak

positive equity response to the Bali bombing, and no response from the Mumbai attack in the Australian market was observed.

Peleg, Regens, Gunter, and Jaffel (2011) find that prolonged terrorism may affect society's resiliency and sensitivity, they find Israel's financial market remained sensitive to each act of terrorism but have shown sustained psychological resilience and indicated no apparent overall market shift. Which is an evidence of erosion of sensitivity to prolonged terrorism. In other words, "normalisation of terror" was observed following an extended period of continued suicide bombings.

Cam (2008) studied the impact of the 9/11, Bali and Madrid bombings on 135 industry equity indexes in the United States using event study method. The empirical evidence showed that industries reacted differently to terrorism. Following 9/11, Airline, hotel and leisure industries recorded negative abnormal returns whilst water, defense and telecommunications industries showed positive abnormal returns, which confirms with Bruck and Wickstrom (2004). Bali and Madrid attacks had little impact on the US industry equity returns, suggesting that US industries were only moderately sensitive to these attacks.

Garvey and Mullins (2008) studied the London Financial Market with focus on terrorist events carried out during 1998 to 2004 and examined how they have been perceived among participants of the London financial market. Financial options was used as a measurement tool for measuring terrorist risk perception. If risk amplification/attenuation is occurring one would expect to see changing levels of demand in the options markets. Data from the London options market suggested a high degree of sensitivity to terrorist events and it reveals a vulnerability in the financial markets.

Eldor and Melnick (2004) studied the impact of suicide attacks (on Jewish population) on financial markets, results exhibited long run effect of suicide attacks on financial markets. They also find no evidence for market unresponsiveness to terror attack over time and financial markets continued to incorporate NEWS related terror attacks as they occur efficiently.

Following literature review, we can assume that investors not necessarily react negatively to terrorist attacks. Investors tend to respond negatively only when they perceive an increase in the expected risk and market players may react if they perceive that the terrorist attack will have an impact on expected returns. Further it is possible that stock markets do not react

negatively on days surrounding a major terrorist attack however we believe that markets can respond differently to the different attacks and that the variability in risk and returns differs significantly across different sectors within an economy.

Many studies have investigated the relationship between terrorism in Pakistan and other aspects of Pakistan economy. Previous research in this area falls roughly into two groups. The first group of studies tests the main determinants of terrorism in Pakistan. Papers in second groups examine the effects of terrorism on economic growth. A brief review of these studies is presented in the following paragraphs.

Shahbaz et al. (2013) used an economic reasons for the increase of terrorism in Pakistan rather than focusing on the political and institutional factors on terrorism. Capital and trade openness were integrated with economic growth to explore the causal relationship between terrorism and economic growth. Long-run relationship and direction of causality between the variables were tested. Empirical results confirmed a long-run relationship between economic growth, terrorism, capital, and trade openness. The bidirectional causality is found between capital and terrorism, capital and trade openness, and trade openness and terrorism. The unidirectional causality was noted running from economic growth to terrorism.

Shahbaz (2013) using annual data from 1971 to 2010 investigated the relationships between terrorism, economic growth and inflation. The analytical results demonstrated long-run linkages between terrorism, economic growth and inflation in Pakistan; further it revealed that an increase in inflation will escalate terrorism whilst economic growth also contribute in escalating terrorism. Beside this bidirectional causality was also noted for inflation and terrorism. Consequently it is concluded that lowering the inflation will reduce terrorism. Further it deduce some problems for policy-makers in their quest for economic growth as growth would result in an increase in terrorism activities.

Raza and Jawaid (2013) investigated the impact of terrorism on tourism in Pakistan by using annual time series data from the period of 1980 to 2010. Empirical evidences confirmed long run negative relationship between terrorism and tourism and also confirmed the unidirectional causal relationship between terrorism and tourism; where causality runs from terrorism to tourism.

3 Data and Modelling

Base on literature review it is identified that the earlier research can be divided into two categories, event-studies: where behavior of the financial markets were studied for the period around i.e. before and after the occurrence of terrorist events (Essaddam and Karagianis (2013); Graham and Ramiah (2012); Aslam and Kang (2013); Chesney et al. (2011); Peleg et al. (2011); Drakos (2010); Eldor and Melnick (2004)) and terrorism index-studies: where the impact of terrorism on financial markets were studied through country specific terrorism index (Alam (2013); Arin et al. (2008)). Further these index were constructed on subjectively determination of terrorist events by researcher which may raise doubts about their being unbiased.

To study the impact of terrorism on financial market of Pakistan where non-stop series of act of terrorism are occurring all over the country; event study methodology will not be able to accurately estimate the risk associated with each of the event. However there is a need to have a study which can envisions the overall impact of terrorist activities, not just a single activity, or selected numbers of activities index as in earlier mentioned type of studies. To fill this gap and to have a holistic picture of impact of terrorism on financial market of Pakistan we constructed an index similar to (*GTD (Global Terrorism Database) (2013) 'Incidents over time: search results'*. *GTD, University of Maryland, College Park, MD, 2013*) and called it terrorism impact factor with Lingering Effect (TIFL). For this index, impact factor for every terrorist incident that occurred during the studied period and are listed in the database of GTD(2013) was calculated and a monthly series of TIFL was developed for testing the hypothesis.

3.1 Data

Financial data: We used monthly stock price data from Datastream over the period 2002(Jan) – 2011(Dec), for a total of 120 observations for 13 industries.

Terrorism data: For the second data set we fabricated a new terrorism impact factor index using publicly available information on terrorist event mainly provided by Global Terrorism Database (GTD, 2013). The terror events that occurred during the weekend are summed up to the last Friday's figure. Data cover all terrorist events that occurred in the sampled period from 2002(Jan) to 2011(Dec). In earlier researches mostly event-study methodology is used to evaluate the effect of terrorist events (Brown and Warner, 1980; Chen and Siembs, 2004;

Abadie and Gardeazabal, 2003). Further where index are constructed researcher subjectively determined terrorist events for the construction of their index ((Chesney et al., 2011; Aslam & Kang, 2013)). We used monthly terror index, which was constructed using all terrorist activities that have taken place from 2002(Jan) to 2011(Dec) listed in Global Terrorism Database (GTD). GTD recorded 3061 events during the mentioned time period. Using GTD Terrorism Index scoring method daily terror index (relative impact of incidents)was constructed and later on converted into monthly terror impact factor index. There are four factors counted in monthly score:

- Number of terrorist events occurred in a particular month.
- Number of fatalities due to terrorist events in a particular month.
- Number of injuries caused by terrorist events in a particular month.
- Estimated level of property damage from terrorist events in a particular month.

Each of the factors is weighted differently; the daily terror index is defined as the sum of 3 * number of human casualties + 0.5 * number of people injured + number of terrorist attacks + 2 * level of total property damage ¹ occurred each day which was later on converted into monthly. Finally five month weighted average is applied to importantly reflect the lingering psychological effect of terrorist acts over time.

Figure 1 shows the severity and intensity of the terrorism impact factor. The height of the bars indicate the severity whereas intensity can be observed by the density of the bars. It can be observed that after 2007 the severity and intensity both has increased drastically.

3.2 Model

The aim of this study is to test the impact of prolonged terrorist attacks on overall stock market through its index and on different industries listed in Karachi stock exchange. The basic model we used for this research is given below:

$$SP = TIFL + I + \epsilon_t \tag{1}$$

¹Incident causing less than US\$1 million are accorded a weighting of 1, between \$1 million and \$1 billion a 2, more than \$1 billion a 3 and zero for unknown level of property damage level

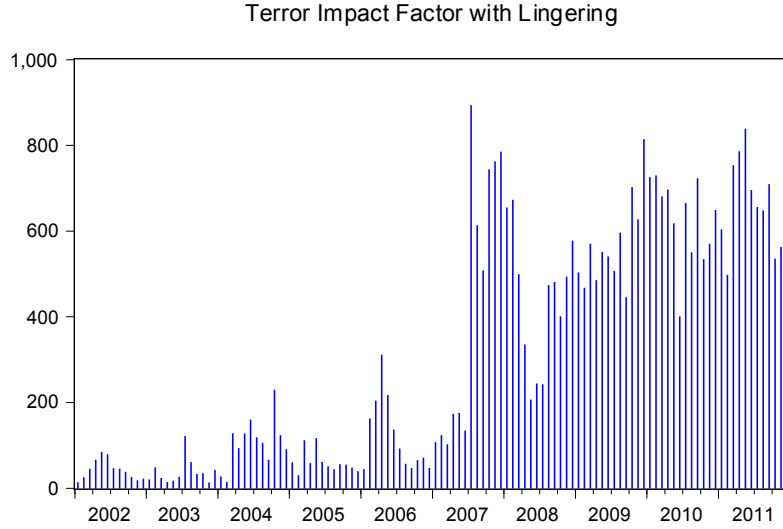


Figure 1: Terror Impact Factor with Lingering Effect

Where SP represents the total market index/sector index, $TIFL$ (Terrorism Impact Factor with Lingering Effect) is the focus variable of the study; I represents the set of control variables in the model, comprising foreign direct investment(fdi)², net portfolio investment (pi)³ and remittances (rem).

Augmented Dickey Fuller (ADF) unit root test is used to examine the stationary properties for time series variables. Augmented Dickey Fuller (ADF) test is based on equation given below:

$$\Delta Y_t = \alpha + \beta T + \gamma Y_{t-1} + \sum_{j=1}^k \delta_j \Delta Y_{t-j} + \epsilon_t$$

Where ΔY_t is for the first difference of the time series Y_t , α is the constant, β is the coefficient of time trend, k is the maximum lags order of the autoregressive process and ϵ_t is the error term also known as white noise. ADF test provides cumulative distribution of ADF statistics. Augment Dicky Fuller (ADF) test determines whether the estimate $\gamma = 0$ or $\gamma < 0$. The series is said to be stationary if the test statistic is less than the critical values from fuller table.

Johansen and Jeuselius J.J (1990) and Auto Regressive Distributed Lag (ARDL) cointegration methods are used to examine the long run relationship between $tifl_t$ and x_{it} . The J.J. cointegration test is based on λ_{Trace} and λ_{max} statistics. First “trace test” cointegration rank

²(Pilinkus, 2009)

³(Jawaid & Haq, 2012)

‘r’ is as follow:

$$\lambda_{Trace} = -T \sum_{j=r+1}^n \ln(1 - \lambda_j)$$

Second, λ_{Max} maximum number of cointegrating vectors against $r + 1$ is presented in the following way:

$$\lambda_{Max}(r, r + 1) = -T \ln(1 - \lambda_j)$$

Where λ_{Max} the maximum eigenvalue statistic test the null hypothesis that there are r cointegrating relations against the alternative hypothesis that there are $r + 1$ cointegrating relations in the system. The λ_{Trace} the trace statistic tests the null hypothesis that there are at most r cointegrating relations in the system, against the alternative of m that is, the number of cointegrating vectors is less than or equal to r . ‘ T ’ is the sample size, \ln is the logarithm, and λ_j is the eigenvalue. The critical values for the λ_{Max} and λ_{Trace} test statistics are tabulated in Pesaran et al. (2000).

If there is one cointegrating vector for each model, it shall be identified by normalising Market index for overall market model response and by normalising Sector Index for each sector model. The cointegrating vector is normalised based on the argument that (overall market and sector) indices of a stock market can be estimated using equation 1.

4 Empirical results

In this section the results of the casual relations between terrorism; measured through newly developed terrorism index TIFL and stock prices are reported and discussed.

The results of the ADF unit root test statistics are reported in Table 2. The lag length used to estimate the ADF unit root. Test statistics is based on the Akaike Info criterion. All studied variables are found to be non-stationary at level and stationary at first difference, which hold for the existence of unit root in all variables.

The results of the cointegrating vectors are reported in Table3. λ_{Trace} and λ_{Max} test statistics are computed with unrestricted intercepts and no trends in VAR. For overall market index, the λ_{Trace} and λ_{Max} test statistics show that there is one cointegrating vector at the 5% significance level and similarly it also exist for all studied sectors at 5%. In general, existence of one cointegrating vector for all indicies is not rejected. This study normalises the cointegrating

vector by X_{it} indices.

Table 2: Stationarity Test Results

<i>variables</i>	<i>Level</i>		<i>Difference</i>	
	C	C&T	C	C&T
ER	1.141	-1.918	-5.409	-7.901
FDI	-1.743	-1.714	-10.152	-10.117
PI	-1.774	-1.830	-2.952	-4.049
REM	1.306	-2.731	-4.323	-5.213
TIFL	-1.734	-3.319	-15.181	-15.118
Market Index	-0.207	-1.304	-8.857	-8.861
Oil & Gas	0.665	-1.145	-8.729	-8.838
Auto & Parts	-0.371	-1.955	-9.120	-9.127
Industrial	-1.838	-1.835	-7.776	-7.746
Utilities	-0.683	-1.257	-9.600	-9.606
Consumer	-2.385	-2.597	-7.740	-7.811
Tobacco	-1.674	-1.655	-8.590	-8.575
Chemical	-0.002	-2.366	-7.955	-7.997
Financial	-1.507	-1.583	-8.257	-8.226
Health & Care	-0.912	-1.445	-8.052	-8.030
Telecom	-1.842	-1.983	-10.230	-10.246
Travel & Leisure	-1.436	-2.277	-8.438	-8.414

Table 3: Cointegration Test Results

<i>Model</i>	<i>Nul Hypothesis No. of CE(s)</i>	<i>Trace Statistics</i>	<i>5% Critical values</i>	<i>Max-Eigen Statistic</i>	<i>5% Critical values</i>
Market Index	None	109.509	95.753	44.661	40.077
	At Most 1	64.847	69.818	29.229	33.876
	At Most 2	35.618	47.856	16.902	27.584
Oil & Gas	None	109.467	95.753	42.354	40.077
	At Most 1	67.113	69.818	26.009	33.876
	At Most 2	41.104	47.856	19.260	27.584
Utilities	None	137.303	95.753	62.662	40.077
	At Most 1	74.641	69.818	40.259	33.876
	At Most 2	34.382	47.856	16.914	27.584
Auto & Parts	None	116.548	95.753	43.283	40.077
	At Most 1	73.264	69.818	28.939	33.876
	At Most 2	44.325	47.856	18.874	27.584
Consumer	None	97.338	95.753	40.707	40.077
	At Most 1	56.631	69.818	23.480	33.876
	At Most 2	33.150	47.856	13.630	27.584
Industrial	None	107.132	95.753	45.964	40.077
	At Most 1	61.167	69.818	27.287	33.876
	At Most 2	33.879	47.856	10.892	27.584
Tobacco	None	178.133	95.753	75.344	40.077
	At Most 1	102.789	69.818	60.168	33.876
	At Most 2	42.620	47.856	22.406	27.584
Chemical	None	153.947	95.753	63.599	40.077
	At Most 1	90.348	69.818	38.155	33.876
	At Most 2	52.193	47.856	28.534	27.584
Financial	None	191.984	95.753	86.270	40.077
	At Most 1	105.713	69.818	63.952	33.876
	At Most 2	41.760	47.856	19.280	27.584
Health & Care	None	184.733	95.753	75.847	40.077
	At Most 1	108.886	69.818	63.871	33.876
	At Most 2	45.015	47.856	20.737	27.584
Telecom	None	149.656	95.753	75.745	40.077
	At Most 1	73.911	69.818	43.206	33.876
	At Most 2	30.705	47.856	13.376	27.584
Travel & Leisure	None	141.259	95.753	69.353	40.077
	At Most 1	71.905	69.818	34.780	33.876
	At Most 2	37.125	47.856	15.367	27.584

Normalised cointegrating vectors are reported in Table4. The likelihood ratio test statistic is used to test that the coefficient of explanatory variable is zero. The results of the likelihood statistic are rejected mostly at the 1, 5 or 10 percent level. Therefore the explanatory variables are generally important to be included in the estimation.

Table 4 summarize the empirical results for prolong terrorist attacks, measured through terrorist impact factor with lingering effect, evidence of significant negative as well as positive impact are found for different industries.

The results reported show a significant negative effect on overall Market and Oil&Gas. The negative effect specifies that, besides personal injuries and the loss of lives of targeted population, the terror attacks also have economic costs which reduce firms' expected profits. Further it indicates that industries with a negative reaction to domestic terrorism are more are more susceptible to overseas assaults.

However four industries Financial, Consumer, Tobacco and Healt&Care exhibited statisti-

cally significant positive relationship with the stock price. The financial industry index which includes insurance and banks as sub-industries had the highest positive coefficient.

This result was expected as terrorist risk prolonged and increased after engaging in war on terror, leading to further demand for insurance. Also after the events of 9/11 Pakistan assumed a wide range of dangerous responsibilities for the international campaign against terrorism and received substantial assistance. Pakistan's debt was unscheduled for 28 years, which provided a relief of about \$1 billion a year in debt servicing. Strict scrutiny of Muslim bank accounts holders of foreign bank in Western countries impelled Pakistanis to repatriate their foreign accounts back to Pakistan, mainly through official channels. As a result, remittances went up. Private investors in the Middle East also felt that it would be less risky to invest their surplus capital in Pakistan than in Europe and America. These external factors increased bank deposits and its profitability.

Finally for Consumer, Tobacco and Health&Care industries there seems no obvious reason for this positive movement but it could be that, these industries, were perceived as a 'refuge' industries, comparable to other risky industries. Showing the investor sentiments in shifting their investment to less risky asset during the periods of high risk events (Liu, Longstaff, & Pan, 2003).

Table 4: Results of the Normalized Cointegration Vectors

<i>Model</i>		<i>ER</i>	<i>FDI</i>	<i>PI</i>	<i>REM</i>	<i>TIFL</i>
Market Index	<i>Coefficient</i>	-2.256	1.327***	2.310***	1.267***	-0.771***
	<i>t-statistics</i>	-0.288	4.896	3.071	3.151	-2.988
Oil & Gas	<i>Coefficient</i>	7.377	2.547**	10.330***	5.753***	-4.323***
	<i>t-statistics</i>	0.232	2.338	3.472	3.440	-4.089
Utilities	<i>Coefficient</i>	-8.409	-2.230***	9.806***	0.317	0.367
	<i>t-statistics</i>	0.468	4.684	8.198	0.351	-0.672
Auto & Parts	<i>Coefficient</i>	9.003	1.666**	10.945***	2.668**	-1.443*
	<i>t-statistics</i>	0.380	2.155	4.513	2.130	-1.908
Consumer	<i>Coefficient</i>	49.697**	-0.284	11.732***	-0.203	2.983**
	<i>t-statistics</i>	1.755	-0.297	4.556	-0.140	-3.285
Industrial	<i>Coefficient</i>	8.127	0.164	2.822***	0.156	-0.883**
	<i>t-statistics</i>	1.053	0.650	4.060	0.406	-3.532
Tobacco	<i>Coefficient</i>	-6.890	2.564***	11.619***	-0.613	2.637***
	<i>t-statistics</i>	-0.459	6.540	10.505	-0.814	5.757
Chemical	<i>Coefficient</i>	-20.922	-2.130***	10.591***	1.389	0.725
	<i>t-statistics</i>	-1.115	-4.201	8.197	1.472	1.241
Financial	<i>Coefficient</i>	-97.825***	7.157***	8.891***	2.183**	4.119***
	<i>t-statistics</i>	-5.198	14.256	6.766	2.334	7.151
Health & Care	<i>Coefficient</i>	-4.639	0.713***	1.614***	-0.087	0.518***
	<i>t-statistics</i>	-1.518	8.912	8.110	-0.583	5.630
Telecom	<i>Coefficient</i>	2.545	11.371***	-38.075***	2.184	-0.093
	<i>t-statistics</i>	0.040	6.535	-8.748	0.688	-0.048
Travel & Leisure	<i>Coefficient</i>	152.541	-13.866***	54.363***	-0.829	1.258
	<i>t-statistics</i>	1.654	-5.725	8.944	-0.179	0.447

* Test statistic significant at the 0.10 level ** Significant at the 0.05 level *** Significant at the 0.01 level

5 Conclusion

In this paper, we examine the effect of terror attacks; measured through Terrorism Impact Factor with lingering effect on stock price of listed companies in Karachi Stock Exchange (KSE). Our investigation exhibits that over the studied period of ten years (2002 to 2012) both intensity and severity of the terrorist events fluctuated stock prices differently, listed in different sectors of KSE 100 index. A long term relation between them were also eminent which reject the plausible idea of terrorism becoming part of the routine life i.e. “Normalisation of Terror”. Moreover it indicates that market is efficient in integrating the terror news and remain unsuccessful to accumulate evidence supporting unresponsiveness to terror attack over time. Consequently it is concluded that Karachi stock market is functioning in an efficient way.

This paper also tested the impact of terrorist attack on different industries listed in KSE 100 index. It was noted that different industries responded differently to terrorism. Some industries experienced decrease in price while others recorded increase, the financial, tobacco and health & care saw prices rising. In contrast, oil & gas, auto & parts, industrial, telecoms experienced fall in prices. The analytical results of this paper highlighted the similarities that exist between TIFL and risky events. Likewise this paper also provide some clues for investors desiring to reduce risk related to terrorism through industry diversification.

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