Terrorism and Pakistan Stock Exchange: Evidence from 'War on Terror'

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Abstract

This paper addresses the impact of terrorism on Pakistan Stock Exchange (PSX) in the wake of 'war on terror'. Being a front line country in the 'war on terror, Pakistan witnessed a number of terrorist attacks across the whole country. This research analyses the 90 terrorist events happened across six major cities (Karachi, Islamabad, Lahore, Peshawar, Rawalpindi, and Quetta) for 33 listed firms over the period of 2000-2011 using event study method. The sample years (2000-2011) are used in the research paper as most of the terrorist attacks in Pakistan took place in this period, according to Global Terrorism Database. Any unexpected returns around various terrorist events are calculated by market model and market adjusted model. Any significant unexpected returns in stock prices vis-à-vis terrorist attacks conform the existence of semi-strong form of Efficient Market Hypothesis (EMH).

The results indicate that, on average, the terrorist events do not have a significant negative impact on the stock returns on announcement date; instead, significant negative unexpected returns are documented a day after the event dates. The findings nullify the semi-strong form of efficiency. The only exception is significant negative returns for median value on announcement date which confirms the existence of efficiency in semi-strong form. However, the significant negative values after the announcement date confirm that share returns take time to incorporate new public information at the PSX. It may be one explanation for insignificant unexpected returns on announcement date as the negative effect prevails after the event date. The findings are useful for regulators to work on improving the market efficiency and for investors to devise policies keeping the negative effect of terrorism on stock exchange.

Keywords: Terrorism, Event Study, Semi-Strong Efficient Market Hypothesis, Pakistan Stock Exchange, War on Terror.

Introduction

Terrorism is a debatable subject due to 'war on terror' and hard to define in concrete words. The French revolution gave rise to terrorism in late 1700.[3] It is

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[3]http://www.terrorism-research.com/history/early.php

defined as planned and intentionally done murder. A number of social scientists have given their own interpretation of terrorism. Various definitions on terrorism can be found; therefore it is a term open to perception. Some people might justify terrorism by signifying it as their holy duty or a rebellion against the oppressors. Others might see it as an unforgivable crime (Enders and Sandler, 2011).

Terrorism in Pakistan encompasses sectarian violence, political hostility, bomb blasts, target killing and kidnapping.[4] A growing body of economic analysts today is seeking to analyze the consequences of terrorism. The loss caused by terrorism is not only limited to human lives but to economic activity as well (Ender and Olson, 2012). Since stock market plays a pivotal role in the economic growth of a country therefore negative stock return caused by terrorism can impart drastic consequences on the economy of a country (Ali et al., 2001; Abbasi, 2013). The idea of this research is to understand the phenomenon of terrorism which is very threatening to the economy of Pakistan. During the 10 years from 2001-11, the war on terror cost Pakistan $ 67.93 billion or Rs.5037 billion[5] in both direct and indirect manner.

Efficient market hypothesis (EMH) determines how efficiently the financial market responds to news. It takes three forms: weak, semi-strong and strong form of efficiency. This research is conducive with semi-strong form of EMH, i.e., the new public information in the market is instantly reflected in the share prices (Fama, 1970; Ali et al., 2001). The news of terrorist attacks do have a significant impact of the stock market of Pakistan (Rehmanet al., 2011). This criterion can be useful in studying the behavior of stock market and thereby devising strategies for investment on part of individuals and organizations.

With a view to find the economic impact of terrorism, event study method is used on 90 terrorist events over the period of 2000-2011 on PSX.[6] The sample years are selected deliberately as most of the terrorist attacks took place in this period, according to Global Terrorism Database.[7] The period (2000-2011) is essentially the peak year of war on terror in Pakistan which can better explain the impact of terrorism on the stock exchange in Pakistan. Market Model and Market Adjusted Model are employed to study the fluctuation in the stock market due to terrorist attacks. **Literature Review**

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[4]http://www.start.umd.edu/gtd/search/Results.aspx?country=153
[5]http://www.finance.gov.pk
[6]The three stock exchanges of Islamabad, Lahore and Karachi de-mutualized to become one Pakistan Stock Exchange (PSX) in January 2016. The PSX maintains the same old KSE-100 index as performance indicator. In the study the words PSX and KSE (Karachi Stock Exchange) are used interchangeably (www.psx.com.pk).
[7]https://www.start.umd.edu/gtd/

Numerous researches have been conducted on the impact of terrorism on the financial markets especially after the accident of 9/11 in the USA. Various methods, samples and terrorist events are taken by researchers to probe the consequences of terrorism on the financial institutions especially in the context of 'war on terror'. Charles and Darné (2006) used a method based on the outlier detection to study the consequences of the terrorist attack of 9/11 on stock markets throughout the world. The international stock market clearly demonstrated a steep fall in response to terrorist attack, both temporary and permanent. The news announcements were also seen to have a phenomenal impact on the European and U.S stock markets. Guidolin & Ferrara (2005) conducted the comparison of internal stock markets and international markets and concluded that internal stock markets were more vulnerable. Terrorism disturbs the financial market which leads to ever more uncertainty in due course of time. Bruck and Wickstrom (2004) studied the effect of terrorism on financial system and markets both directly and indirectly. The results confirmed more significance of indirect impact of terrorism than direct impact of terrorism. It was also observed that bad policies aggravated negative impact on terrorism. Chen and Siems (2004) used event study on the basis on efficient market hypothesis to gauge the impact of terrorism on global capital markets.[8] This research noted more resilience in the US market owing to its stability of banking/financial sector which provides greater liquidity and lessens the panic.

After 9/11, sufficient amount of literature exists to study the impact of terrorism on economy across the globe. For example, Graham and Ramiah (2012) used the hypothesis based on the model of adaptive expectations and the event study to study five terrorist incidents on Japanese industries. The results suggested adoption of precautionary measures against such untoward incidents. Kollias et al. (2011) conducted his study on the influence of terrorist attacks on London Stock Exchange and Athens Stock Exchange. The results from both event study methodology and conditional volatility showed that maturity, size and type of terrorist attacks contribute to the volatility of the market reactions. Frijns et al. (2012) used domestic Capital Asset Pricing Model (CAPM) and international CAPM on 15,500 firms from 19 emerging markets.[9] The results showed an increase in market integration, though variation existed among different countries. The findings of the paper showed that political crises had a depressing impact on

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[8]This research paper looked into 14 terrorist/military data from 1915 to two of the recent events, Iraq's invasion of Kuwait in 1990 and the September 11, 2001 terrorist attacks.

[9]The countries were from three regions: Eastern Europe (Russia, Czech Republic, Poland, Greece, and Hungary), Latin America (Peru, Chile, Colombia, Brazil, and Mexico), and Central and South and East Asia (Thailand, India, Indonesia, China, Malaysia, South Korea, Taiwan, Sri Lanka, and Philippines)

the integration of stock markets. Three important terrorist attacks which included World Trade Center attack, Madrid and London train bombing were examined to see if it had any impact on the stock of Greece by (Liargovas and Repousis, 2010). Ordinary Least square (OLS) and market model were used in this research and found negative abnormal returns. Kollias et al. (2010) studied two events, the bomb attacks of 7/7 in London in 2005 and 11th March 2004 in Madrid. Event study method and GARCH family models were used to analyze how stock markets in London and Spain responded to terrorist attacks. The results confirmed significant negative abnormal returns for the Spanish market but not as much for London. It may prove the point that the London Stock Exchange recoiled quickly as compared to Spanish market. Chesney et al. (2011) empirically studied the effect of terrorist attacks on shares, commodity and bond markets. The methodologies used were non-parametric, event study and GARCH-Evt. The results found that some markets were harmfully affected by terrorist events. Nguyen and Enomoto (2009) used seven dummy variables[10] to examine the effect of terrorism on the stock markets of Iran and Pakistan. The results gave negative readings for attack of world trade center and London bombing for both countries, Pakistan and Iran.

Since, terrorism is most prevalent in Pakistan as a consequence of 'war on terror', a growing number of researchers have turned towards this cause. For example, Aurangzeb and Dilawer (2012) applied regression analysis and granger causality to study the impact of terrorist events (Bombing, armed isolation, assassination and hostage taking) on the KSE-30 index. The results confirmed the negative effect on the stock returns due to terrorist attacks. Aslam and Kang (2015) found negative impact of terrorist attacks of 470 terrorist attacks on the KSE-100 index. Additionally, the author documented market resiliency which vary from time to time.[11] Gul et al. (2013) examined the impact of natural calamities, political turmoil and terrorism on the shares of the financial sector of Pakistan using paired sample t-test for daily data. All events showed a significant negative impact on share prices. In a related study Bilal et al. (2012) examined the link between terrorism, interest rate and inflation on the KSE. They used statistical techniques[12] on daily and monthly data for macro-economic factors. The results

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[10]D1 is terrorist bombing of USS Cole on October 12, 2000; D2 is the event of 9/11 of world trade center attack on September 11, 2001; D3 is bombing in Indonesia on October 12, 2002; D4 is war in Iraq on March 20, 2003; D5 is bombing in Madrid on March 11, 2004; D6 is train bombing in London on July 7, 2005 and D7 is golden mosque bombing from Feb. 22 to 27, 2006.

[11]Except for the years 2005-2008 which got affected by terrorist attacks for as long as 10 days, in other years the shock of terrorist attacks was absorbed within a day.

[12] The statistical methods were Phillip Perron, unit-root Augmented Dickey Fuller test, Granger's causality test, Johansen' co-integration, ARCH, GARCH and GARCH-EVT.

concluded that there existed co-integration between inflation, interest rates and the KSE stock returns while a negative relationship existed between stock returns and terrorism. Using Multiple Regression Model, Qaiser et al. (2012) studied the reaction of both exchange rates and the KSE stock prices in response to terrorism. The result showed that terrorism had a significant harmful impact on the KSE and the currency too suffered a setback due to terrorism. The exchange rate showed positive relation with terrorism as the demand for foreign currency exceeded the supply for foreign currency. The impact of terrorist attacks on three financial markets of the KSE, FOREX market and Interbank market were analyzed by Gul et al. (2010) from 2006-2008. The effect of terrorist attacks on each market varied; however all showed a negative behavior to terrorist events. The results found that terrorist activities negatively influenced the financial markets. Ahmed et al. (2016) studied how tourism industry got affected by terrorism. The results showed that the tourism industry performed very poorly under the influence of terrorism which was one of barriers to tourism in Pakistan.

This paper analyses the impact of terrorism on PSX to measure semi-strong of efficiency over an extended period of time i.e., 2000-2011 especially in the context of 'war on terror', with the following hypothesis:

H_0: Terrorist attacks (war on terror) have no significant impact on the stock prices of the KSE (PSX).

H_1: Terrorist attacks (war on terror) have significant impact on stock prices of the KSE (PSX).

1. Method

This research uses quantitative method of event study. It is used to examine the impact of 90 terrorist attacks in the major cities (Karachi, Lahore, Islamabad, Peshawar, Rawalpindi, and Quetta) and several other cities over the period of 2000-2011 on the share prices of 33 KSE listed firms. The firms are selected from different industrial sectors (Oil and Gas, Automobiles, Electric, Travel/Leisure, Health, Pharma and Biotech, Banks and General Industries) to see if there is any variance in stock returns to the news of terrorist attacks (Suleman, 2012). The sample years (2000-2011) are selected deliberately as most of the terrorist attacks in Pakistan took place in this period, according to Global Terrorism Database.

All the impactful events were collected from Global Terrorism Database (https://www.start.umd.edu/gtd/). The terrorist events depend on many factors such as nature, type and location of the event (Aslam and Kang, 2015). The events more severe in nature have more drastic consequences on the KSE stock prices. Therefore, those events were selected which caused most human losses (Aslam and Kang, 2015). In addition to that, those events have also been included which were politically threatening (Suleman, 2012) as the impact of good political news

on volatility was relatively low compare to the bad political news (Suleman, 2012). Special consideration has been given to those events which took place in Karachi as the city provides almost 70% of the revenue of the government and contributes about a quarter of GDP to Pakistan.[13]

An event study is "an investigation of the relationship between security prices and economic events (Strong, 1992, p. 533). This method measures any unexpected returns which can be macroeconomic such as terrorist events, major power cuts, shutting down of businesses, changes in government regulations or company specific events such as announcement of dividends, mergers, and liquidation etc. (Khan, 2011). Event study is a useful tool for uncovering interesting knowledge that endows the researchers with better understanding of investment and financing (Fama, 1991). The variation between actual return and expected return is called as unexpected return.

Discrete or logarithmic approach can be used to share returns (Strong, 1992). Theoretically, logarithmic returns are more favorable as it increases the normality of the return distribution (Henderson, 1990; Strong, 1992).

Daily returns [R_{it}] are calculated for 33 firms using the share prices over the Period 2000-2011. The logarithmic returns (Strong, 1992) is calculated as follows:

$$R_{it} = Ln\ (P_{it}/P_{it-1})$$
$$[1]$$

Where P_{it} is the share prices of firm i on day t; Ln shows the natural log and P_{it-1} is the share price of firm i on the previous day.

Using log, market return was calculated as follows where KSE-100 is a proxy for it:

$$R_m = Ln\ (KSE100_t/KSE100_{t-1})$$
$$[2]$$

Where R_m is the market returns; Ln represents the natural log; $KSE\text{-}100_t$ shows the index data on day t; and $KSE100_{t-1}$ is the index data on the previous day.

Instead of weekly and monthly data, daily data was used to examine the effect of terrorist attacks on share prices. This isolates the impact of the event since the probability of any sort of impact from other announcements is reduced (Morse, 1984; Dyckman et al., 1984; Brown and Warner, 1985). Still, numerous problems arise from the use of daily share prices. As it has been noted by Brown and Warner (1985) that statistical problems like autocorrelation and non-normality arise from daily returns. Other than that, there is a higher probability of inconsistency and bias in estimating model parameters when examining daily data. However, this problem has been solved by the natural log of share returns in order

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[13] http://centralasiaonline.com/en_GB/articles/caii/features/pakistan/main/2012/04/05/feature-01

to minimize the non-normality in the data (Strong, 1992). Moreover, the research also employs non-parametric tests in case the non-normality of daily data. Day t_0 is taken as announcement date, the day that the news are recorded. According to the signaling hypothesis, if information is conveyed by the news of terrorist attack, the unexpected returns on this date should be different from zero. Unexpected returns are calculated over a 21-day period from day t-10 to day t+10 centered on the date of terrorist attack according to the formula:

$$UR_{it} = R_{it} - E(R_{it})$$
[3]

Where R_{it} represent the actual share returns of firm i on day t and $E(R_{it})$ shows the expected returns for this firm on the same day.

Excess returns are calculated using Market Adjusted Returns and abnormal returns are measured using Market Model Returns around the period of event. This research focuses on the market model for the estimation of abnormal returns (unexpected returns) around the announcement date of an event (Aharony and Swary, 1980; Pettit, 1972; Lonie et al., 1996; Easton, 1991; McCluskey et al., 2006). Market model is regarded as the most convenient method of calculating abnormal returns (Brown and Warner, 1980; Strong, 1992). Besides, the market model also controls the size effect (Schwert, 1983). In the market model a linear relationship is assumed between the market index and expected return of an individual security. Therefore, it is calculated as:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + e_i$$
[4]

Where R_{it} shows the stock returns; R_{mt} represents the return on market index; α_i depicts the intercept of the regression model; β_i is the measure of systematic risk and e_{it} is the error term.

Abnormal returns (AR_{it}) is then estimated by subtracting the actual security return from its expected return.

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$$
[5]

Where the expected returns are calculated with the help of the market model on the basis of 30 trading days before to the event period for each terrorist attack. Various periods of estimation periods have been employed in the literature for calculating the market model parameters using OLS. The 180 days were used for study of Ireland and UK by McCluskey et al. (2006) while 300 observations were included by Abeyratna (1994) in his procedure of estimation.

For calculating excess returns it is assumed that the expected return for the share of a firm is equal to the market return (proxied by the KSE-100 index). Therefore, excess returns are the difference between the actual return of a share and the

market return (KSE-100 index) for the same day. The excess returns (ExR_{it}) are calculated as follows:

$$ExR_{it} = R_{it} - R_{mt} \qquad [6]$$

Where R_{it} shows the actual return of firm i at time t and R_{mt} represent the market index at time t. Abnormal and excess returns are estimated for the sample of 33 firms around the event period of 21-day for testing the hypothesis that terrorist attacks affect the returns of firms listed on the KSE-100 index.

4. Results of Event Study

Table (1) shows the abnormal returns for the event period of 21-day around the terrorist attacks.

Table 1: Abnormal Returns around Terrorist Events

	Abnormal Returns				
DAY	**Mean**	**Median**	**SD**	**Skewness**	**Kurtosis**
t-10	0.000080 (0.912)	-0.000009 (0.374)	0.038377	0.28	59.51
t-9	0.00264 (0.006)*	0.000000 (0.008)*	0.05089	20.68	788.09
t-8	0.000284 (0.661)	0.000000 (0.788)	0.034321	0.67	28.66
t-7	-0.000503 (0.462)	-0.000184 (0.029)*	0.036230	0.90	64.02
t-6	-0.000654 (0.343)	0.000000 (0.199)	0.036544	-2.58	55.13
t-5	0.000282 (0.672)	-0.000009 (0.839)	0.035384	-0.09	29.64
t-4	0.000543 (0.421)	0.000000 (0.093)	0.035780	-0.53	38.61
t-3	0.000713 (0.282)	0.000000 (0.859)	0.035136	-1.81	70.43
t-2	-0.00104 (0.308)	0.00000 (0.320)	0.05399	13.74	681.31
t-1	-0.00187 (0.010)*	-0.000336 (0.003)*	0.03831	-7.28	183.92
t0	0.000189 (0.757)	0.000000 (0.978)	0.032471	-0.83	20.96
t+1	-0.001377 (0.047)*	-0.000028 (0.011)*	0.039812	-5.47	159.53

t+2	0.000080 (0.905)	-0.000014 (0.368)	0.035655	-1.29	93.95
t+3	0.000269 (0.717)	0.000000 (0.595)	0.039355	-0.54	74.41
t+4	-0.000348 (0.692)	-0.000016 (0.086)	0.04659	7.80	271.95
t+5	0.000784 (0.291)	0.000000 (0.639)	0.039322	-0.40	102.53
t+6	-0.000457 (0.514)	-0.000193 (0.015)*	0.037107	2.48	49.11
t+7	0.00122 (0.119)	0.000000 (0.114)	0.04160	11.07	367.33
t+8	-0.000471 (0.604)	-0.000022 (0.028)*	0.04821	9.89	290.41
t+9	-0.00175 (0.027)*	-0.000016 (0.020)*	0.04207	-10.85	324.69
t+10	-0.000558 (0.434)	0.000000 (0.444)	0.037784	-5.71	115.08

Note: An * shows a significance of the two-tailed at the 5% level. The p-values for medians are calculated on the Wilcoxon Signed Rank test and the p-values for the means are measured with the help on a one-sample t-test. In addition, SD stands for the standard deviation for the mean values.

The values of standard deviations provide some insight into the spread/variability of abnormal returns around the mean values. A t-test is a measure of the statistical significance of mean values while significance level of median values is calculated with the help of non-parametric Wilcoxon signed rank test.[14] Skewness is used to indicate any asymmetry and deviation from a normal distribution. Kurtosis is also determined to see any sign of flattening of a distribution.

Table 1 depicts a number of findings. The mean and median values for the abnormal return on day t_0 are insignificant which refers that terrorist attacks do not lead to have abnormal returns and nullifies the semi-strong form of efficiency. The results of the study suggest that on next day of terrorist event, we see a sharp decline in the mean value of abnormal return of share prices. It is evident from day t+1 where both mean and median values haves shown negative abnormal returns with significant p-values. It refers that PSX takes one day to absorb the negative

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[14] Brown and Warner (1980) also documented that: "t-tests...are reasonably well specified....on the other hand, certain non-parametric tests used in event studies are not correctly specified....unless [there is] asymmetry in the distribution." (pp. 248-249)

news of terrorist attack Drakos, 2010; Gul et al., 2010; Bilal et al., 2012; Qaiser et al, 2012; Aurangzeb and Dilawer 2012; Gul et al., 2013; Aslam and Kang, 2015), though it is against the assumption of semi-strong efficiency which expects the abnormal return on the day of the event. It nullifies semi-strong form efficiency on the ground that stock exchange takes time to incorporate new public information. There is also significant negative abnormal return a day before the announcement date. One cannot predict the forthcoming events of terrorism; hence the significant value before announcements might be due to other public information. In addition, this finding does not support semi-strong form of efficiency as significant unexpected returns occurred before announcement (Ali et al., 2001).[15]

Table 2 presents the results of excess returns around 21-day window of various terrorist events.

Table: 2 Excess Returns around Terrorist Events

	Excess Returns				
DAY	**Mean**	**Median**	**SD**	**Kurtosis**	**Skewness**
t-10	-0.001766 (0.008)*	-0.001940 (0.000)*	0.035321	58.76	-0.27
t-9	0.00151 (0.101)	-0.000389 (0.388)	0.04880	924.04	22.97
t-8	-0.001251 (0.044)*	-0.001534 (0.000)*	0.032901	37.56	0.20
t-7	-0.001599 (0.011)*	-0.001557 (0.000)*	0.033145	60.63	-0.80
t-6	-0.000342 (0.597)	-0.000033 (0.273)	0.034221	57.89	-3.23
t-5	-0.000508 (0.418)	-0.001143 (0.001)*	0.033283	33.40	0.01
t-4	-0.000898 (0.156)	-0.000563 (0.011)*	0.033594	36.57	-1.60
t-3	-0.000017 (0.978)	-0.001075 (0.029)*	0.032210	80.63	-2.52
t-2	-0.00131	-0.00104	0.05036	852.49	18.50

[15]Table 1 also concludes the values of standard deviation of abnormal return. It ranged from the highest value of 5.40% on day t-2 to the lowest value of 3.25% on day t_0 for abnormal returns. The skewness indicates that the abnormal returns are mostly negatively skewed particularly after the day of event which represents asymmetry in the distribution. The value of Kurtosis is greater than 3 which indicate that it is a Leptokurtic distribution which is sharper than a normal distribution.

	(0.168)	(0.000)*			
t-1	-0.001207 (0.039)*	-0.001341 (0.000)*	0.031025	36.22	-1.49
t_0	-0.000274 (0.628)	-0.001459 (0.005)*	0.030035	22.87	-0.64
t+1	-0.002707 (0.000)*	-0.002129 (0.000)*	0.037423	174.24	-7.00
t+2	-0.000677 (0.244)	-0.000850 (0.000)*	0.030813	56.81	-2.23
t+3	-0.000135 (0.848)	-0.000467 (0.090)	0.037188	79.24	-1.21
t+4	-0.00120 (0.146)	-0.00115 (0.000)*	0.04368	320.75	8.09
t+5	0.001158 (0.085)	-0.000059 (0.695)	0.035639	92.78	1.82
t+6	-0.000476 (0.473)	-0.001081 (0.001)*	0.035189	53.42	2.30
t+7	-0.000461 (0.535)	-0.000930 (0.003)*	0.03937	415.97	12.01
t+8	0.000258 (0.721)	-0.000285 (0.588)	0.038267	58.30	0.83
t+9	-0.001077 (0.069)	-0.000392 (0.003)*	0.031450	23.48	-0.76
t+10	-0.000398 (0.563)	0.000000 (0.134)	0.036422	133.76	-6.32

Note: An * shows a significance of the two-tailed at the 5% level. The p-values for medians are calculated on the Wilcoxon Signed Rank test and the p-values for the means are measured with the help on a one-sample t-test. In addition, SD stands for the standard deviation for the mean values.

On day t_0 the mean excess returns turns negative but insignificant which indicates that the terrorist attacks do have a negative impact on the stock returns. It is worthy to mention that the median excess return is significant on the announcement date indicating share prices embodied the negative public news of terrorist attacks (Ali et al., 2001). This finding supports the semi-strong form of efficiency as these news are reflected quickly on the announcement date. On the event day, the insignificant p-value for mean returns and significant p-value for median abnormal returns may refer that the data is not normal. The negative

affects followed in the subsequent days of event date for both mean and median returns. For example, both mean and median excess returns are significantly negative on day t+1. It confirms the negative impact that terrorist attacks have on stock returns (Aslam and Kang, 2015). The significant excess returns after announcement date refers that the markets takes time to incorporate new information and nullifies the semi-strong form of efficiency. .Both mean and median returns are negative and significant a day before the event as well which indicates that this share movement might be due to other reasons.[16]

Conclusions

The paper concludes the impact of terrorist attacks on share prices of the KSE. The results indicate that, on average, the terrorist events do not have a negative impact on the stock returns on announcement date; instead, significant negative unexpected returns are documented a day after the event dates. It indicates that Pakistani stock exchange takes time to incorporate any public information; thus nullifying the semi-strong efficiency. The results also confirms this explanation as negative returns are reported after the event date. One exemption is the significant negative median excess returns on announcement date which supports our main hypothesis that terrorist attacks have a negative impact and the negative news quickly absorbs in the share prices justifies the semi-strong form of efficiency. One explanation for the insignificant unexpected returns on day t_0 may be the uncertain nature of terrorist event which can happen anytime but when it happens, it has a considerable after effect on the share prices (Ali et al., 2001; Aslam and Kang, 2015).

In addition to that, the results show that the stock market gives negative returns even before the announcement date which indicates that some other public information might affect the returns. The largest positive mean abnormal return (0.12%) is noted for day t+7, it shows that the stock market stabilizes after 7 days (Chen and Siems, 2004). Moreover, it also implies that terrorist events bring volatility in the stock market.

The findings of our study are useful for regulators, policy makers, economists, investors, banks and insurance companies to consider the volatility caused by terrorist attacks. An effective contingency plan is therefore needed to be

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[16]In Table 2 we see the values of standard deviation for excess returns. A range similar to abnormal returns for the standard deviation values is obtained for excess returns as well; they fluctuate from 3.00% on day t_0 to 5.04% on day t-2. This variation in the returns earned explains the insignificance of unexpected returns on day t_0 (Khan, 2011). The skewness shows that the excess returns have a negative skewness, particularly after day t_0 indicating an asymmetry. The Kurtosis is greater than 3 which indicate that it is a Leptokurtic distribution which is sharper than a normal distribution.

developed by the policy making bodies to overcome the negative effect of terrorism on financial firms and overall economy. The financial structure of the economy has to be strengthened so that it can absorb as much shock as it can and its resilience can be improved.

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