

How Different Terrorist Attacks Affect Stock Returns Evidence from Pakistan Stock Exchange

Hashmat Ali

*School of Economics, Dongbei University of Finance and Economics
Dalian R.P China*

E-mail: hashmatali11@qq.com

Tel: 0086-15542531779

Wang Qingshi

*School of Economics, Dongbei University of Finance and Economics
Dalian R.P China*

Zulfiqar Ali Memon

*School of Accounting, Dongbei University of Finance and Economics
Dalian R.P China*

Khan Baz

School of Economics and Management China University of Geosciences Wuhan

Imad Ali

Northwest Agriculture and Forestry University Yangling, P.R China

Abstract

The global financial markets have responded in an extremely steady pattern after the United States 9/11 event, 2002 Bali's night clubs blast suicide, the train bombing in 2004-2005 in London and Madrid and similarly the suicide attacks by a terrorist in Pakistan. In this paper, we studied the return in Karachi stock market which is occurred due to the terrorist attack news. We applied the model which lets bad and good news to have changed effects on volatility. The finding is carried out applying the event study methodology. Our finding shows the news of terrorist attacks has an adverse effect on stock return. Though the KSE 100 index volatility increased by these events Pakistan stock exchange negatively affected by terrorist attacks. The effect of attack depends on attack type, Locations, and target type. The most severe the attack, the more number of people killed the more adverse effects on KSE 100 index return. Very interestingly, capital market covers news regarding future attacks. In total, diverse strategies of terrorists have a different effect on the capital market, it is turn can forecast the attacks of terrorist.

Keywords: Stock Exchange, Terrorism, Event study.

JEL Classification: G10, G14, G15, C22

1. Introduction

Terrorist attacks are very crucial events for the financial market. For example, the NASDAQ and NYSE till 9/17 were shut down after the 9/11 terrorist attack. The DJIA reduced 684 points in the

initial starting days. The current literature shows that terrorism has a negative effect on the global financial market. According to Nedelescu and Johnston (2006) for example, terrorist activities decrease the inducement of investors to save their money and discourages investors' confidence. This phenomenon can expand all over the economy and the entire globe using trade channels and normal business cycles. According Hoffman (2006) studied the historical trends of international terrorism and their effects on economic metrics. However, the current literature is very limited when it comes to focusing on the financial effect and terrorist events especially with the 9/11 attack. Karolyi (2006) resulted that there are some significances of terrorism on the financial sector and economies.

In Pakistan with increasing terrorist attacks, investor sentiment is changing rapidly. It is increasing investment risks and effects the stock market negatively. They lead to poor economic growth, maximize the cost of corporations, increase smuggling and Pakistani society is affected negatively. In the previous ten years, the cost of indirect and direct economic cost was \$68 billion reported by the government official record, according to the 2010-11 Pakistan economic survey it is the equivalent of nearly the total debt of the country. The country faced a lot of continuous terrorist attacks. There are many types of attacks bomb blast, suicide squads, attacks on foreigners, and even the Muslim mosque are not safe which the holiest place there is for Muslims.

The growth potential of Pakistan actually shows and proves that the terrorist attacks negatively affect the stock market of Pakistan. The stock market of Karachi was awarded "The best performing stock market in the world for the year 2002." In December 2007, KSE 100 index stood at its highest points of 14127 with a market volume of Rs.4.57 trillion (1 USD = 85 to 90 Rs). Although the Pakistani government faced a great decline after the revolution. The KSE 100 index declined and its points 4,675 with a market volume of Rs.1.58 trillion, the volume of loss which in December 2007 was over 65%.

However, terrorism is not new phenomena, after the 9/11 terrorist attacks terrorism came to the forefront changed the value of terrorism as a risk of geopolitical and now affects the financial market and global economy. To plan effective strategies to counter terrorism, help minimize its negative economic effect and help to increase investor confidence in capital markets. It is compulsory to know about the kind of terrorist attack and the impact on the financial markets. Therefore our study concentrates on the Pakistan stock market from the period of 2000 to 2011 and the effect of terrorism. For Pakistan in recent years terrorism has developed into the greatest social evil.

Such as there is no similar terrorism definition, also there is no similar reasoning of terrorism. According to their literature, the main reason for terrorism in Pakistan Gunaratna and Nielsen (2008) reported that the Al Qaeda movement from Afghanistan to Pakistan's tribal areas though according to Khokhar (2007) in Pakistan terrorist activities was the major rising reason Madaris. According to Asal et al. (2008) that the main cause of terrorism is not Madaris, and found the role of a family's rejection and joining any jihad group. According to Asal et.al the joining of a family role or refusing any organization of jihad. Gunaratna and Nielsen (2008) found that the Taliban and Al Qaeda movement organization from Afghanistan to Pakistan tribal areas. Afterward, the October 2001 attack on the U.S on the Pakistan Federally Administered Tribal Area (FATA) has developed for as a base for the leaders of Al Qaeda. According to the authors, the hazard will continue for both countries whenever the border of Pakistan and Afghanistan is not cleaned from the radical groups.

According to Khokhar (2007) about in Pakistan the restructuring of Madaris of Militant. After 9/11 the western media has been focusing on Madras. This madaris are from religious education institution (REIs). Currently, the Madaris are considered as a factory for terrorists and the West believes it is linked to terrorism. Later the war on terror Pakistan started an alliance with the U.S, the religious schools and violence forced the Pakistani Government to deal with these religious school. However, some action was taken by the federal government, they were not well applied and all over Pakistan, the Madaris are still operating. According Asal et.al (2008) shows survey from 141 Pakistani families sample the joining of a family role or by refusing any organization of jihad. This study produced about the encouraging and participation in Jihad by their family and what is the main

reason that affected the families' decision to give or reject permission. This study used two logit models of consent and rejection and investigated that there are some factors like social economic and religious which affects the consent and refusal. Well educated and healthier families' did not like to give to their children's consent of Jihad, though jobless families did not like to refuse to join an organization of Jihad. Customs are important when considering militancy as it is found that Deobandis (a group which follows the Hanafi School of thought) are less likely to give consent to their children's decision to join the jihad. In contrast, Khokhar (2007) reported that the Madaris in Pakistan is not the main reason for terrorism.

2. Literature Review

The effect of terrorism on the stock market research in its emerging phase. Most researchers only pay attention to very low terrorist events, especially on the 9/11 terrorist attacks. Very little work has been done in the area of the effect of terrorism on financial market in terms of a series of terrorist events. According to Karolyi' (2006) research, there is some small amount of proof of identity on the financial and economic significance of terrorism. For what we believe is for the first time, in our paper we find the long relationship among attacks of terrorism and the stock market of Pakistan. In our study we took the type of attacks, the location of attacks and time of attacks that which type of terrorist attacks that subsequently caused human loss. Though we investigate the effect of terrorist attacks and also find the timing of terrorist activities.

The effect of terrorism on the stock market currently has a lot of research which all shows it has a negative effect. According to Abadie and Gardeazabal (2003), Barth et al(2006), Karolyi and Martell (2010), Barros and Gil-Alana (2009), Gul et al (2010), Zussman and Zussman (2006), Arin, cifferri, and Spagnolo (2008), Drakos (2010) Nguyen and Enomoto terrorism negatively affects the economy and stock markets. Although according to Chen and Siems (2004), Eldor, Melnick (2004) the stock market is effective there is no proof that supports in the time of terror the market becomes de-sensitized. According to Johnston and Nedelescu (2006), financial markets can be able to bear shocks of terrorism if the authorities respond timely and accurately to the terrorist attacks.

There is no agreement near the cognitive of terrorism. Stock markets economic growth and GDP, around the globe are all negatively affected by terrorism. Though this effect varies from market to market and country to country. Abadie and Gardeazabal (2003) reported that the economic impact of conflict in the relationship of economic growth and market volume of Basque country public firms. They exposed that Basque country's GDP per capita decreased an average of 10 percent, compared with artificially controlled region without terrorism. Stocks of the Basque region overtook the stocks of non-Basque in peace, though on the last of cease fire showed negative performance. Barth et al. (2006) studied and took annual data from 1970 to 2003 and found the effect of terrorism economic growth and capital formation. They investigate that on economic growth the terrorist activities had negative effects. It was investigated the terrorist attacks also target the difference. The attacks of terrorists badly affected the capital formation and growth of private institutions and further research paid attention to financial markets affected by terrorism.

Suarez and Pshisva found a ratio in Colombia among the investment of firm and kidnappings. They investigated that much of the effect of the direct kidnapping of owners and managers as compared to intense crimes such as paramilitary attacks and killings. For organizations, foreign ownership they are much more sensitive to owners and foreign manager's kidnappings. Karolyi and Martell (2010) took many kinds of the terrorist attacks and reported that effect in the US. 75 terrorist attacks that targeted publicly traded firms over an eight years period. By using the event study methodology the researcher found that 0.83% statistically negative significant response in stock value. It was equal to the market value of a \$ 401 million on average loss per attack per firm. The terrorist attacks according to the country had different effects. They found a big negative stock price response in richer and much-elected countries. According to authors that the physical losses less effect the stock

price than the human losses like the executive of a company kidnappings. The kidnapping of a CEO from a selected firm is also associated with human loss, though in our study the main focus is on the human loss irrespective of his affliction with firms. Our finding is different also from previous studies in the relationship between the impacts of infrequent attacks vs frequent attacks. Nguyen and Enomoto (2009) proved the impact of terrorist seven international attacks on Pakistan and Iran stock markets by using the GARCH model they investigate that in Indonesia, the war in Iran and London, and Madrid attacks had significant negative impact on the returns of market volatility. The attack of 9/11 showed that the attack had statistically negatively significant response of -2.76% on capital market of Karachi, while -92% on the Tehran stock market. Gul et al (2010) projected the effect of terrorism on Pakistan stock market for the two years period. By using the method of (OLS) ordinary least square, they investigated that the financial market and economy of Pakistan is negatively affected by terrorist attacks, though the relation of the impact changed for different markets. They suggested that the government should work towards the institutional improvement about investment in the advanced security corporation.

Also, Barros and Gil-Alana (2009) investigated that the stock market of Basque (Bolsa de Bilbao stock market) for the period from July 1st, 2001 to March 18 2006 that was affected by terrorist attacks. They took the Bilbao 2000 Index daily stock market return dependent variable and used the long regression memory models and the violence index as an independent variable. This study investigated that terrorist attacks have a significant inverse impact on the returns of the stock market. On the contrary, violence is positively related with the process of volatility. Zussman and Zussman (2006) investigated that every assassination efforts have normal effects of -0.01 on Tel Aviv 25 index. Stock exchange more replies due to the terrorist group's senior leaders' assassination than members of low ranks.

Most of the research did not find any evidence on the inverse effect on the stock market by terrorism, as some countries market is so flexible and efficient that they can bear the impact of this kind of events. Chen and Siems (2004) measure the impact of fourteen military terrorist attacks from 1915 and used event study methodology. In addition to these fourteen terrorist attacks, the authors took the 9/11 attack on the Pentagon and World Trade Center and also the Kuwait attack event by Iraq. They investigated that the US stock market is more elastic and much more liquid and rapidly recovered as compared to other stock markets in the world. This research found that the 9/11 attack affected the financial market less than the other past events. They used a huge quantity of terrorist attack as above compared mentioned study. The study found the attack trend increased and had an inverse effect on the financial market. The result of this study reveals that attacks in the FATA region have positive effect while attacks in Karachi has a negative impact on the Karachi Stock Exchange, this means that location of attacks matters. In addition to this, it is also found that frequent attacks have insignificant impact as compared to infrequent attacks on the stock market. According to Chen and Siems (2004), financial markets are liquid and has the potential to recover the impact of terrorism. They found a significant negative impact of terrorist activities on the Karachi Stock Exchange with different dimensions. They also concluded that financial markets have the ability to absorb the impact of terrorist attacks. It can be argued that impact of terrorist attacks varies with level and nature of attacks.

This study is partially in line with Eldor and Melnick (2004) they investigated the impact of terrorist attacks on the exchange rates and share prices in Israel's stock market. They found that the impact of the 639 terrorist attacks from 1990 to 2003 on stock market and foreign exchange market. They investigated that the location of attacks does not affect the financial market through the attack of a suicide bomber had a permanently negative effect. Therefore, no one has explained why the market became alerted during the time of terror. This study investigated that the policies of market liberalization contributed to compete with the impact attacks of terrorist.

Buesa et al. (2007) examine that direct economic impact of the terrorist attack in Madrid on 11 March 2004. Furthermore, due to terrorist attacks the damages of infrastructural and physical economic losses of 1600 injuries and 291 fatalities. By using the traditional principle for assessment, they found

because of attack of terrorists there was a € 211.584 million minimum loss to the Madrid regional economy. For Madrid Region, it is 0.16% equivalent of GIP and for the Spain 0.03% national GDP. This study concludes that the 11 March attack had a direct effect of terrorist attacks has been a short run and limited.

According to Johnston and Nedelescu (2006), descriptive study attempt found that the response of the world financial market, in particular, the attack on terrorists and the responses of authorities. This study investigated that the 9/11 terrorist attack on the World Trade Center and the Madrid attack on 11 March 2004, and the following response of the global financial market. This study reported that exact time and the flexible reaction of the authorities is vital to make sure the stock markets are effective in absorbing the shocks caused by terrorism. Globalization in adding to the reaction of the authorities, the syndicate force among the financial institutions, intelligence, regulators and indicating agencies in addition to the government is vital to make sure the monetary system can withstand acts of terror.

3. Data and Methodology

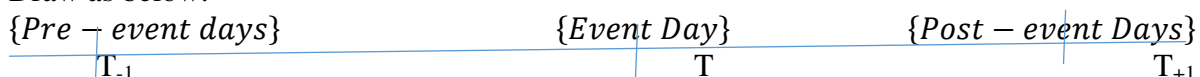
Data

The aim of this study to find the relationship between terrorism and Karachi stock exchange. In this paper, we used the data ranging from the period 2007-2014 with daily stock market observation over the period these years. This study has been used ten major terrorist attacks in Pakistan out of 995 terrorist attacks with diverse target nature and venue in last decade. There were used two type of data one is the news of terrorist attacks and the other KSE-100 index. The KSE-100 index data collected from Yahoo finance (<http://finance.yahoo.com>). We collected the terrorism data from Global Terrorism Data Base (GTD) and also were used from South Asian Terrorism Portal (SATP). Also from many newspapers including The Nation (<http://www.nation.com.pk/>). We collected the location, death, and injuries the data also collected from the media source. It is so difficult to make the definition of terrorism because there are more than a hundred definitions. Terrorism is a controversial subject there is no compressive definition of terrorism. Terrorism can be elaborate such as together method and policy, a holy duty and crime; a justified response to domination and an inexcusable disgrace. The definition clearly depends by whom point of opinion is represented. The Pakistan National Public Safety commission the Anti-Terrorism Act, under section 6 in 1997 defines in the following way the terrorist act. Similarly, the definition of terrorism there more than hundred. The data of terrorist attacks on daily basis collection so difficult and challenging.

Methodology

In this study, we used event study methodology. This method of studying the response of stock exchange opposite a variety of events such as a bad or good news deceleration associated with to politics or specific events of the firm, disastrous events, terrorist events. The main aim of this method is to investigate any deviation in regular daily stock returns as the terrorist attacks result. We used an event window. Which is divided the event window into Pre-event, event day and Post event. The pre-event window consists of seven days before the incidence of a terrorist attack, the event day window consists of one day it the day on which the terrorist attack happens. Whereas the post event window consists of seven days afterward the event occurring time period.

Draw as below:



The direction to study the effect of these terrorist attacks on the stock market, Market model and mean adjusted return model have been applied. The abnormal return of stock exchange as compared to the terrorist attacks date activity and for this investigation, we used the mean adjusted return model. For this aim, the difference is taken expected returns and observed returns.

$$AR_{it} = R_{it} - E(R_{it}) \quad (1)$$

AR_{it} here is the abnormal return at time t of stock i . observed returns R_{it} of index i at time t , while $E(R_{it})$ is the expected return of stock i at time t applying market model which is

$$E(R_{it}) = \alpha + \beta E(R_{mt}) \quad (2)$$

There is α alpha and β coefficient regression in this model, to measure using 250 observations daily bases of stock returns before happening the terrorist event and R_{mt} is taken for market portfolio. The abnormal return of stock market I at time t has been measured through taking the abnormal return's average. The formula for calculating the abnormal returns is given as follows

$$AR_{it} = \frac{1}{N} \sum_{i=1}^N AR_{it}$$

Here AR_{it} represents the abnormal return (AR) of stock market i at time t . Also, the cumulative abnormal returns of stock market have been measured for large event windows of 15 days. The cumulative abnormal returns have been computed using following model.

$$CAR_t = \sum_{t=1}^T AR_t$$

Here T is the day of event where abnormal returns are AR_t . T statistics has been calculated to investigate the abnormal returns statistical difference of stock market as the consequence of all 10 terrorist attacks.

Table 1: Main 10 Terrorist Attacks in Pakistan

| S.N. | Date | Event | Location | Injuries | Death |
|------|-------------------|------------------------------------|----------------|----------|-------|
| 1 | 03 to 11-Jul-2007 | Lal Masjid Islamabad siege | Islamabad | 44 | 154 |
| 2 | 21-Dec-2007 | Aftab Ahmad Khan Sherpao | Charsadda, KPK | 5 | 22 |
| 3 | 27-Dec-2007 | Assassination of Benazir Bhutto | Rawalpindi | 100 | 31 |
| 4 | 27-Jan-2007 | Attack on Malik Muhammad Saad Khan | Peshawar | 85 | 13 |
| 5 | 11-Mar-2008 | FIA Building Attack | Lahore | 20 | 38 |
| 6 | 20-Sep-2008 | Marriott Hotel Attack | Islamabad | 266 | 54 |
| 7 | 09-Jul-2009 | Pearl Continental Hotel | Peshawar | 46 | 17 |
| 8 | 05-Nov-2010 | Darra Adam Khel Mosque Attack | KPK | 65 | 97 |
| 9 | 04-Jan-2011 | Assassination of Salman Taseer | Islamabad | ---- | 1 |
| 10 | 16-Dec-2014 | Army Public School | Peshawar | 121 | 142 |

The Lal Masjid's Siege was a conflict between the Government of Pakistan and Islamic School students started by Shaukat Aziz who was the Prime Minister and President Pervez Musharraf in July 2007. The Lal Masjid operated by two brothers Abdul Rashid and Abdul Aziz who were Islamic militants in 2006 January. The organization supported the obligation of Sharia (Islamic Religious Law) in Pakistan and openly said for the coup of the Government of Pakistan. According to the Pakistani Government during the operation, 154 students were deaths and the round about 50 students were captured.

Aftab Ahmad Khan Seherpo is the Chief of Qaumi Watan Party (QWP) and the member of National assembly was targeted on Thursday evening in Charsadda by a suicide attack. Where he went for attending the anniversary of Alamzeb omer Zai. Sikander Sherpao is the son of Sherpao's and Khyber Pakhtunkhwa Assembly member was also part of the convoy. According to Dawn news, 22 peoples killed in the blast and there are 5 people were injuries. It is also reported that after investigation the ages of suicide bomb attacker was found in between 22-23 years' age.

The Benazir Bhutto assassination on December 27, 2007, took place in Rawalpindi in Pakistan. She was the twice Prime Minister of Pakistan (1988-1990; 1993-1996) and she was the leader of Pakistan People Party (PPP) opposition. She was campaigning in January 2008 for the coming scheduled election. At Liaquat National Bagh after a political rally, the shots were fired and immediately the suicide bomb was exploded. According to the Pakistan local time, she was declared dead at 18:15 in General Hospital at Rawalpindi. According to Dawn news, there were 24 people killed in this event. She had earlier survived same like attack attempted that 139 people were killed in that event after return from an expatriate in two months.

Malik Muhammad Saad Khan Shaheed was the Additional Inspector General of Police, senior two-star rank police officer, and the former Chief Capital City Police Officer (CCPO) of KPK, Pakistan. The security of Provincial Capital of Peshawar was performed by Malik Muhammad Saad Khan. Malik Muhammad Saad Khan was dead in a bomb suicide attack in January 2007 in the Islamic month of Muharram during the reviewing duty and arrangement security during a Shia procession. There were instantaneously attack on across on three building in Lahore which is the main City of Punjab province on Pakistan local time around 9:15 on October 15, 2009, had occurred. There were three groups the first group attacked Federal Investigation Agency's (FIA) Regional Headquarter. The second group attack on Police Training School Manawan.

The third attacker group attacked Elite Police Academy. In this event 38 peoples' dead and around 20 peoples were injuries. The Marriott Hotel bombing attacks happened in 2008, 20 September during night When in the front of Marriott Hotel, the full truck from the explosives exploded in the Capital City Islamabad in Pakistan, and 54 people were killed and around 266 people were wounded. The maximum fatalities were Pakistani and around 15 foreign national's peoples wounded at least 5 people were killed. In June 2009, the Pearl Continental Hotel attack bombing happened in Peshawar in Pakistan in which round about 46 people were wounded and around 17 people were killed. The explosion happened in the city five-star Pearl Continental Hotel. The Darra Adam Khel Mosque bombing attack happened in 2010, 5 November. In this bomb attacks, round about 66 people included were killed, children also include and 80 were injuries by attacker bomb suicide in the mosque who's performed worshipers Jumu'ah the Friday prayer congregational in the Khyber Pakhtunkhwa Darra Adam Khel in Pakistan. Salman Taseer was a Liberal politician, business man and 26th Governor of the provinces of Punjab till 2008 his assassination in 2011. On January 4, 2011, in Islamabad Kohsar Market he assassinated by his bodyguard, who disagreed on Pakistani blasphemy law with Taseer,s opinion. The Taseer,s murder described by the Guardian one of the big shocking events in Pakistan history recently. The Pakistani nation three days state of sorrow was held. On December 16, 2014, the attack conduct by six gunmen whose related with Tehrik-i- Taliban (TTP) in KPK northern area on Army Public School in Peshawar Pakistan. The attacker all were foreign nationalities, including tow Afghans, one Chechen, and three Arabs. The attacker entered to school and started a fire on children, staff and 132 school's children and 10 staffs were killed.

4: Empirical Analysis

Table 2: Descriptive statistics for both AR and CAR returns.

| Event | Lal Masjid Islamabad siege | | Aftab Ahmad Khan Sherpao | |
|-----------------|----------------------------|----------|--------------------------|----------|
| | AR | CAR | AR | CAR |
| Mean | -0.00095 | 0.006075 | -0.00404 | -0.01792 |
| Median | -0.00121 | 0.008177 | -0.00097 | -0.00851 |
| 25th Percentile | -0.00133 | 0.003237 | -0.00333 | -0.01296 |
| 75th Percentile | 0.003614 | 0.010338 | -0.0008 | -0.00582 |
| S.D | 0.009068 | 0.007458 | 0.012915 | 0.0218 |

| Event | Assassination of Benazir Bhutto | | Malik Muhammad Saad Khan | |
|-----------------|---------------------------------|----------|--------------------------|----------|
| | AR | CAR | AR | CAR |
| Mean | 0.00065 | -0.00763 | 0.004331 | 0.029103 |
| Median | -0.00097 | 0.002256 | -0.00045 | 0.031839 |
| 25th Percentile | -0.00107 | -0.00574 | -0.00051 | -0.00044 |
| 75th Percentile | 0.000698 | 0.005293 | 0.00776 | 0.057197 |
| S.D | 0.018835 | 0.023015 | 0.007085 | 0.02375 |

| Event | FIA Building Attack | | Marriott Hotel Attack | |
|-----------------|---------------------|----------|-----------------------|----------|
| | AR | CAR | AR | CAR |
| Mean | -0.00023 | 0.012879 | -0.00026 | -0.00618 |
| Median | -0.00073 | 0.013526 | -1.6E-05 | -0.00575 |
| 25th Percentile | -0.00524 | 0.00714 | -0.00044 | -0.00742 |
| 75th Percentile | 0.00138 | 0.01987 | 0.000692 | -0.00513 |
| S.D | 0.008968 | 0.009869 | 0.001493 | 0.001313 |

| Event | Pearl Continental Hotel Peshawer | | Darra Adam Khel Mosque Attack | |
|-----------------|----------------------------------|----------|-------------------------------|----------|
| | AR | CAR | AR | CAR |
| Mean | -0.00149 | -0.02097 | 0.000622 | 0.008651 |
| Median | 0.000626 | -0.01328 | -0.00093 | 0.009337 |
| 25th Percentile | -0.01092 | -0.03988 | -0.0037 | -0.00425 |
| 75th Percentile | 0.000766 | -0.01135 | -0.0008 | 0.01915 |
| S.D | 0.011034 | 0.014405 | 0.006293 | 0.010877 |

| Event | Assassination of Salman Taseer | | Army Public School | |
|-----------------|--------------------------------|----------|--------------------|----------|
| | AR | CAR | AR | CAR |
| Mean | 0.001506 | 0.010944 | -0.00226 | -0.02801 |
| Median | -0.00089 | 0.009695 | -0.0005 | -0.03385 |
| 25th Percentile | -0.00164 | -0.00177 | -0.00658 | -0.04159 |
| 75th Percentile | 0.004322 | 0.026728 | 0.001644 | -0.0157 |
| S.D | 0.008638 | 0.014683 | 0.008175 | 0.0168 |

Table 2 shows the summary statistics of abnormal return (AR) and cumulative abnormal return (CAR) of terrorism event Lal Masjid Islamabad siege for the 15 days' time period. The mean and median of abnormal return (AR) are negative whereas the mean and median of Cumulative abnormal (CAR) return indicate a positive return. Similarly, the standard deviation of Abnormal return (AR) and accumulative abnormal return (CAR) are shown 0.009068 and 0.007458 respectively. Similarly, that the terrorist event Attack on Aftab Ahmad Khan Sherpao's abnormal return and cumulative abnormal return for the 15 days' time range. The mean and median for abnormal return both are negative while for cumulative abnormal returns the mean and median are also negative. Although the standard deviation of abnormal return (AR) and cumulative abnormal return are positive 0.012915 and 0.0218 respectively.

The abnormal return (AR) and cumulative abnormal return (CAR) of terrorism event of Assassination of Benazir Bhutto for the 15 days' time frame. The mean shows that there is a positive relationship with abnormal return and median indicate for abnormal return negative. While the mean for cumulative abnormal return (CAR) is negative return and median is indicating a positive return. Also, the abnormal return (AR) and cumulative abnormal returns (CAR) standard deviation are indicated respectively 0.018835 and 0.023015, whereas that the return of Attack on Malik Muhammad Saad Khan event abnormal return and cumulative abnormal return for 15-day time period. The mean of abnormal return (AR) is positive return and median indicates negative return. While the mean and median of cumulative abnormal return (CAR) shows a positive return. Similarly, the standard deviation of abnormal return and cumulative abnormal return indicate 0.007085 and 0.02375 respectively.

The abnormal return (AR) and cumulative abnormal return (CAR) the terrorist incident of FIA Building Attack Lahore for 15 days' time period. The mean and median of abnormal return (AR) indicate are negatively return similarly the mean and median of cumulative abnormal return (CAR) are showing a positive return. Whereas the standard deviation shows for abnormal return (AR) and cumulative abnormal return respectively 0.008968 and 0.009869. While the terrorist attack on Marriott Hotel Attack's abnormal return (AR) and cumulative abnormal return (CAR) for 15 days' time period. The mean and median of abnormal return are both negative returns while the mean and median for cumulative abnormal return are also both negative returns. Similarly, the standard deviation of abnormal return (AR) and cumulative abnormal return (CAR) shows respectively positively returns 0.001493 and 0.001313 values.

The abnormal return (AR) and cumulative abnormal return (CAR) of the Pearl Continental Hotel Peshawar's terrorist attack the time period 15 days. The mean indicates of abnormal return is negative return while the abnormal return (AR) shows a positive return. Whereas the mean and median of cumulative abnormal return (CAR) shows negative returns. The standard deviation for abnormal return (AR) and Cumulative abnormal return (CAR) are both shows positively return in order 0.011034 and 0.014405. In the Darra Adam Khel Mosque Attack terrorist attacks, abnormal return (AR) and the cumulative abnormal return (CAR) for the 15 days' time period. The abnormal return's (AR) mean shows positively returns and similarly median indicate the negative return. While the cumulative abnormal return mean and median produced the positive returns. Whereas the standard deviation of abnormal return (AR) and cumulative abnormal return for both shows positive in order 0.006293 and 0.010877.

The abnormal return (AR) and cumulative abnormal return (CAR) of terrorist event Assassination of Salman Taseer for 15 days' time period. The mean of abnormal return shows the positive return on another hand the median indicate of abnormal return is a negative return. Similarly, the mean and median of cumulative abnormal return (CAR) is shown a positive return. While the standard deviation of abnormal return and cumulative abnormal return the order of 0.008638 and 0.01483 shown positively. Although terrorism event of Army Public School terrorist attack shows abnormal return and cumulative abnormal return for the time period 15 days. Whereas the negative effect of terrorism event on capital market agrees by literature. (Nguyen and Enomoto, 2009; Karyolyi and Martell, 2010; Suleman 2012). The mean and median of abnormal return (AR) shows negative returns while the mean and median of cumulative abnormal return (CAR) indicate the negative return for both. Though the standard deviation of abnormal return and cumulative abnormal return are showing respectively 0.008175 and 0.0168 positive return

Table 3: AR and CAR before and after the terrorist attacks.

| Lal Masjid Islamabad siege | | |
|-----------------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | 0.003237 | 0.003237 |
| -6 | 0.004182 | 0.007419 |
| -5 | 0.001981 | 0.009401 |
| -4 | -0.00122 | 0.008177 |
| -3 | -0.00121 | 0.006962 |
| -2 | -0.00133 | 0.005631 |
| -1 | -0.00886 | -0.00323 |
| 0 | 0.002235 | -0.001 |
| 1 | 0.010359 | 0.009361 |
| 2 | 0.003614 | 0.012975 |
| 3 | -0.00134 | 0.011634 |
| 4 | -0.0013 | 0.010338 |
| 5 | -0.0013 | 0.009041 |
| 6 | 0.006371 | 0.015412 |
| 7 | -0.02964 | -0.01423 |

| Assassination of Benazir Bhutto | | |
|--|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00086 | -0.00086 |
| -6 | -0.00333 | -0.00419 |
| -5 | 0.009478 | 0.005293 |
| -4 | -0.00097 | 0.004325 |
| -3 | -0.00104 | 0.003286 |
| -2 | -0.00103 | 0.002256 |
| -1 | 0.000698 | 0.002955 |
| 0 | -0.00403 | -0.00108 |
| 1 | -0.04912 | -0.05019 |
| 2 | -0.00085 | -0.05104 |
| 3 | -0.0008 | -0.05184 |
| 4 | 0.046107 | -0.00574 |
| 5 | 0.017584 | 0.011848 |
| 6 | -0.00102 | 0.010823 |
| 7 | -0.00107 | 0.009753 |

| FIA Building Attack | | |
|----------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00078 | -0.00078 |
| -6 | -0.00595 | -0.00672 |
| -5 | 0.013862 | 0.00714 |
| -4 | 0.011624 | 0.018763 |
| -3 | -0.00524 | 0.013526 |
| -2 | -0.00074 | 0.012787 |
| -1 | -0.00072 | 0.012071 |
| 0 | 0.00138 | 0.01345 |
| 1 | 0.014269 | 0.02772 |
| 2 | -0.00715 | 0.020566 |
| 3 | 7.58E-05 | 0.020642 |
| 4 | -0.00077 | 0.01987 |
| 5 | -0.00072 | 0.019148 |
| 6 | -0.00073 | 0.018416 |
| 7 | -0.02183 | -0.00341 |

| Aftab Ahmad Khan Sherpao | | |
|---------------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00613 | -0.00613 |
| -6 | -0.00238 | -0.00851 |
| -5 | 0.000644 | -0.00787 |
| -4 | -0.00088 | -0.00875 |
| -3 | -0.00088 | -0.00963 |
| -2 | -0.00333 | -0.01296 |
| -1 | 0.009478 | -0.00348 |
| 0 | -0.00097 | -0.00445 |
| 1 | -0.00104 | -0.00549 |
| 2 | -0.00103 | -0.00652 |
| 3 | 0.000698 | -0.00582 |
| 4 | -0.00403 | -0.00985 |
| 5 | -0.04912 | -0.05896 |
| 6 | -0.00085 | -0.05981 |
| 7 | -0.0008 | -0.06061 |

| Malik Muhammad Saad Khan | | |
|---------------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00044 | -0.00044 |
| -6 | -0.00052 | -0.00096 |
| -5 | -0.00067 | -0.00163 |
| -4 | -0.00084 | -0.00247 |
| -3 | 0.013696 | 0.011222 |
| -2 | 0.015371 | 0.026593 |
| -1 | 0.006222 | 0.032815 |
| 0 | -0.00049 | 0.032327 |
| 1 | -0.00049 | 0.031839 |
| 2 | -0.00045 | 0.031389 |
| 3 | 0.006394 | 0.037783 |
| 4 | 0.020434 | 0.058216 |
| 5 | -0.00051 | 0.057707 |
| 6 | -0.00051 | 0.057197 |
| 7 | 0.00776 | 0.064957 |

| Marriott Hotel Attack | | |
|------------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00505 | -0.00505 |
| -6 | -0.00044 | -0.00549 |
| -5 | -0.0016 | -0.00709 |
| -4 | -0.00033 | -0.00742 |
| -3 | -0.00012 | -0.00755 |
| -2 | -0.00081 | -0.00836 |
| -1 | 0.000514 | -0.00785 |
| 0 | 0.000717 | -0.00713 |
| 1 | 0.000695 | -0.00644 |
| 2 | 0.000689 | -0.00575 |
| 3 | 0.000619 | -0.00513 |
| 4 | -0.00025 | -0.00538 |
| 5 | -1.6E-05 | -0.0054 |
| 6 | 0.000692 | -0.0047 |
| 7 | 0.000735 | -0.00397 |

| Pearl Continental Hotel Peshawer | | |
|---|-----------|------------|
| Event | AR | CAR |
| -7 | 0.000539 | 0.000539 |
| -6 | -0.01131 | -0.01077 |
| -5 | -0.01844 | -0.02921 |
| -4 | -0.01535 | -0.04456 |
| -3 | 0.003159 | -0.0414 |
| -2 | 0.000766 | -0.04063 |
| -1 | 0.000758 | -0.03988 |
| 0 | 0.02853 | -0.01135 |
| 1 | -0.00493 | -0.01628 |
| 2 | 0.006954 | -0.00933 |
| 3 | -0.00395 | -0.01328 |
| 4 | 0.000635 | -0.01264 |
| 5 | 0.000632 | -0.01201 |
| 6 | 0.000626 | -0.01139 |
| 7 | -0.01092 | -0.0223 |

| Assassination of Salman Taseer | | |
|---------------------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00089 | -0.00089 |
| -6 | -0.00088 | -0.00177 |
| -5 | -0.00605 | -0.00782 |
| -4 | 0.002314 | -0.00551 |
| -3 | 0.011267 | 0.005759 |
| -2 | -0.00164 | 0.004123 |
| -1 | -0.0153 | -0.01118 |
| 0 | 0.020874 | 0.009695 |
| 1 | 0.001615 | 0.011309 |
| 2 | 0.013942 | 0.025252 |
| 3 | 0.004322 | 0.029573 |
| 4 | -0.00094 | 0.02863 |
| 5 | -0.00095 | 0.027679 |
| 6 | -0.00095 | 0.026728 |
| 7 | -0.00415 | 0.022576 |

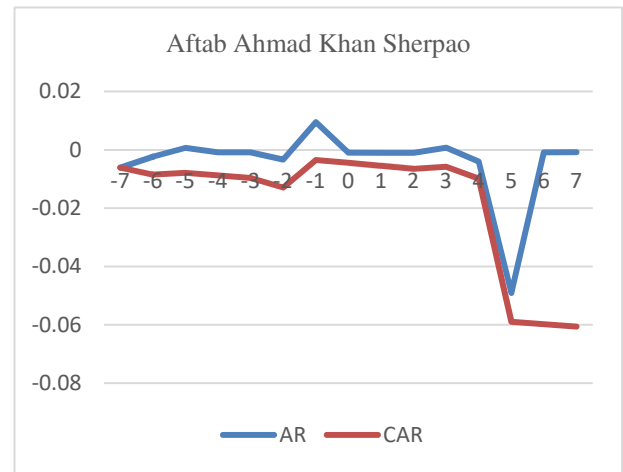
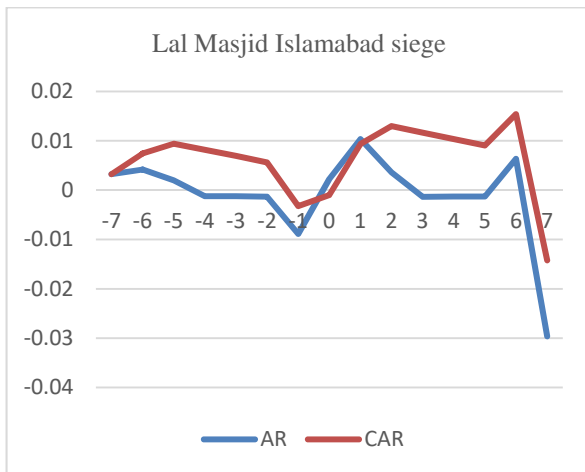
| Darra Adam Khel Mosque Attack | | |
|--------------------------------------|-----------|------------|
| Event | AR | CAR |
| -7 | -0.00425 | -0.00425 |
| -6 | -0.0008 | -0.00504 |
| -5 | -0.0008 | -0.00584 |
| -4 | -0.0008 | -0.00664 |
| -3 | 0.012682 | 0.006042 |
| -2 | -0.00686 | -0.00082 |
| -1 | 0.00706 | 0.006243 |
| 0 | 0.0157 | 0.021944 |
| 1 | -0.00093 | 0.021011 |
| 2 | -0.00093 | 0.020081 |
| 3 | -0.00093 | 0.01915 |
| 4 | -0.00093 | 0.018219 |
| 5 | -0.00093 | 0.017288 |
| 6 | -0.00425 | 0.01304 |
| 7 | -0.0037 | 0.009337 |

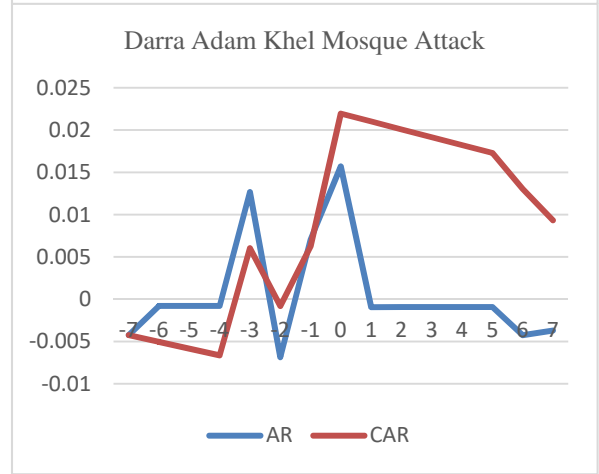
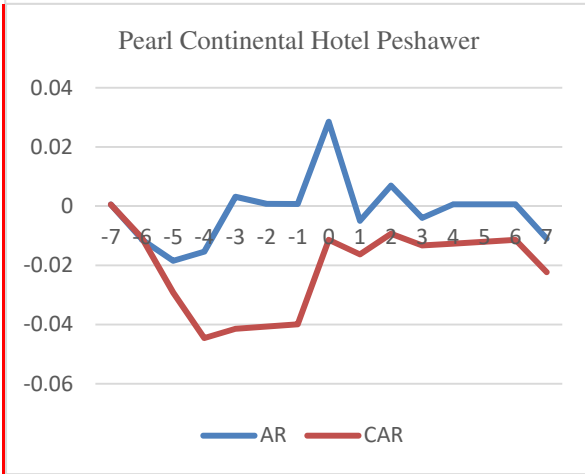
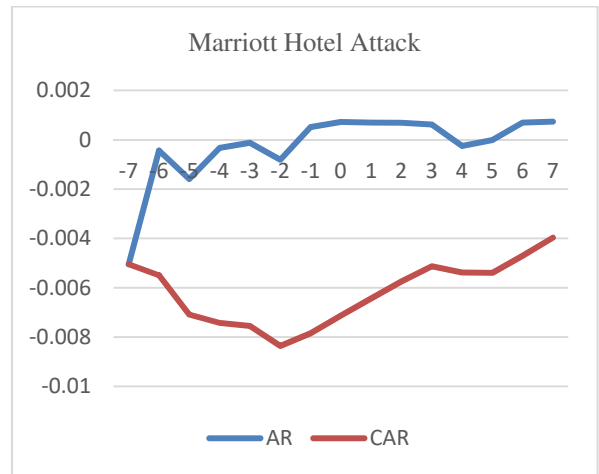
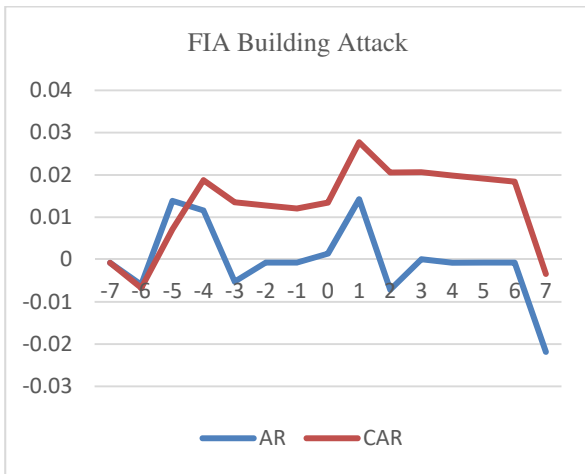
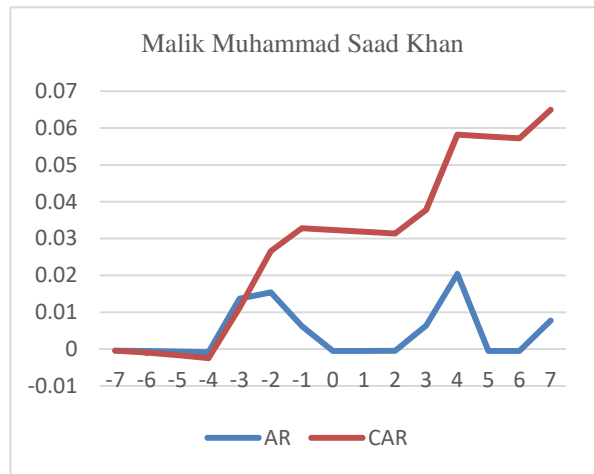
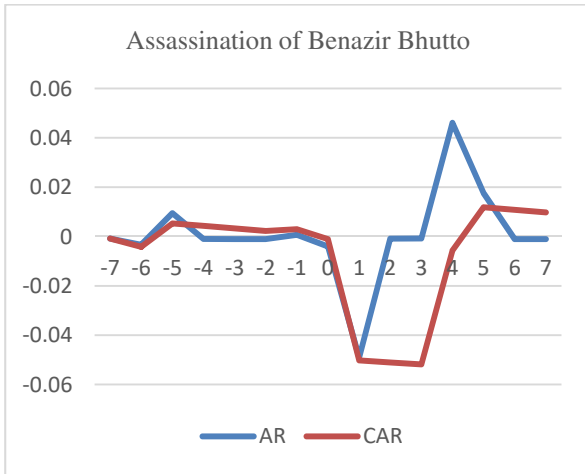
| Army Public School | | |
|--------------------|----------|----------|
| Event | AR | CAR |
| -7 | 0.001644 | 0.001644 |
| -6 | -0.01009 | -0.00845 |
| -5 | -0.00068 | -0.00912 |
| -4 | -0.00658 | -0.0157 |
| -3 | -0.00054 | -0.01624 |
| -2 | -0.0005 | -0.01674 |
| -1 | -0.0005 | -0.01724 |
| 0 | -0.02641 | -0.04365 |
| 1 | -0.00716 | -0.05081 |
| 2 | 0.004829 | -0.04598 |
| 3 | 0.005532 | -0.04044 |
| 4 | -0.00036 | -0.0408 |
| 5 | -0.00037 | -0.04118 |
| 6 | -0.00041 | -0.04159 |
| 7 | 0.007737 | -0.03385 |

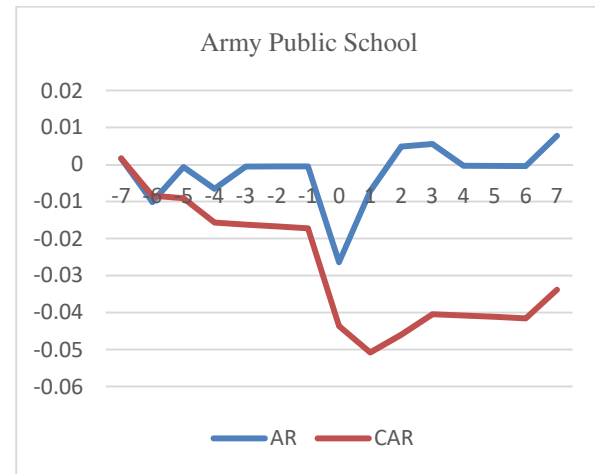
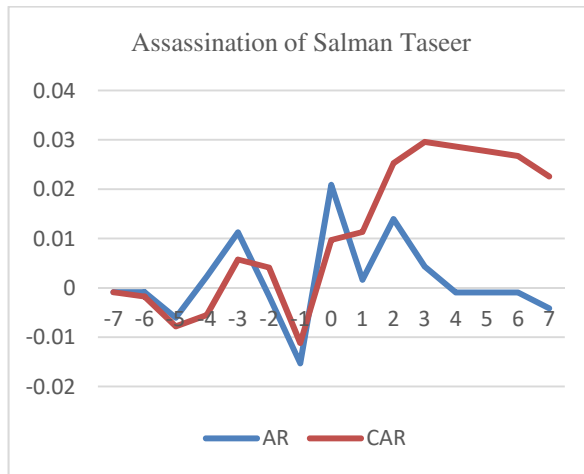
Table 3 Illustrates the abnormal returns (AR) and cumulative abnormal returns (CAR) calculated over the [-7, +7] window period around about the attack events. It is revealed that most of the Abnormal returns (AR) across all the events negative before the date of attack events. Interestingly on the attack day (Zero day), they are showing almost negative return. That the market showing that had closed and the market that was still open the abnormal return (AR) were negative. The attacks following portion show that the abnormal return (AR) shows to be negative most of the event day. In other words, in the events following portion, the abnormal returns (AR) shows that the investor turned from these stocks, expected the worsening of the geopolitical situation. In the term of cumulative abnormal return's investigation, the picture obviously shows that all over the terrorist attacks events the cumulative abnormal return (CAR) maximum are positive and some are negative returns after the terrorist event. The investors suggesting were determined regarding the future (negative) geopolitical situation and take the direction of these stock.

5. Graphical Representation

In order to study the impact of the terrorist event on KSE-100 index, graphical presentation of daily closing points of the index for three estimation window has been made through line graphs.







The above Figures graphs indicate the impact of 10 major terrorist attacks events occurred in Pakistan along with their abnormal return (AR) and Cumulative abnormal return (CAR) on KSE 100 index over the period 2007 to 2014. The graph has been representing the 15 days' time period of estimated windows (Pre- event, event and Post event) for the closing points of KSE-100 index. The time range from 1 to 7 days shows pre-event window, 1 day shows the event day and from 9 to 15 days indicates post event window. For windows estimated for these terrorist attacks has been taken on X-axis and for KSE-100 index has been taken at the y-axis. The visual examination of all graph shows that majority of the events observe a decline in the abnormal and cumulative abnormal returns. Such result shows that the terrorist activities negatively affect the performance of the stock market returns.

6. Discussion

The main purpose of the current study to investigate the behavior of market reaction of 10 major terrorist events in Pakistan of last decade. The KSE-100 index has affected statistically significant shows by the study results. The Benazir Bhutto assassination attack in 2007 created in the country a great violence. It is completely distressing the country law and order situation and also, as a result, the obliteration of main property. The event caused a quick decline after this immediate restoration of the market. The above graph clearly shows again the index decline sharply. Its decline can completely cooperate to the happening of this attack. Though in the graph shows the recovery in post event window of it high attack can be ascribed to most important to the speech of Pakistan President Musharraf announced after the attack that for the country upcoming general election there will be no delay. The investor and especially foreigner investor's confidence boosted by this announcement. The graph 1 shows that the stock market investment activities again quickly restore. In the last decade, the Marriott hotel attack in Islamabad in 2008 was one of the biggest attacks. The stock market investment was negatively affected the by this attack. Although in graph no can be seen that already the market was finished before the happening of this attack. There are a lot of causes to fall this index which could be ascribed. The most important reason for Pakistan stock exchange the foreigner seller planned pressure which caused fall the index. Besides that, one of the highest PML-N political party departures from government alliance reasons in the investor minds serious uncertainty, so the investors from the equity market started withdrawing investment. In the last the attacks of Marriott hotel additional fuel to fire and market further dropped. Due to the all of these tensions the stock exchange mostly static and even never restore in post event period. In last decade, the Darra Adam Khel attack 2010 was the most destructive attacks which caused 97 casualties in Pakistan. The consequence shows that on stock market KSE-100 index there is no effect of this attack, remained positive, on an average in the together pre-event window to event window to a period of post event window. This graph shows also the rising motion after the attack of KSE-100 index. Although there is a minor decrease in graph line after some days of this attack in post event time period the rising motion again stated. The feasible causes

those could be ascribed to the market behavior must be the terrorist attack happen in a tribal area where almost the terrorist attack happening. This attack magnitude was not harsh like previous two attacks but the market influenced by this attack. The Pakistan's people quite used to for one decade a continuous war on terrorism then the investor's mood affected by this terrorist attack could not be more than one or two days.

7. Conclusions

In Pakistan terrorism has developed the common critical phenomenon causing not only injuries and fatalities but as well as the cost of economic real cost. The attacks of terrorist have exposed an extraordinary flow in Pakistan since 2000. Terrorism in Pakistan increasing the uncertainty for a domestic and foreign investor to invest capital in Pakistan, it negatively impacts on the stock exchange and can lead to lesser economic growth, Maximized the companies cost and adversely affects the Pakistan society. The direct and indirect the terrorism economic cost in previous 10 years has 68 billion dollars according to the Pakistan government statistics. This paper exposed the effects of terrorist attacks on Pakistan stock exchange used time series daily data from the period 2007 until 2014. In these days Pakistan is a laboratory for terrorism there are non-stop terrorist attacks with a different method in all over the country by a terrorist. In the previous 7 years, there are a lot of major terrorist's attacks occurred have caused deaths and injuries. The adverse effect shows on KSE-100 index that elsewhere the damage of valuable lives, it terrorist attacks had actual economic cost for Pakistan. By applied the event study methodology, we investigate that terrorist attacks have a negative impact on the Karachi stock market performance and return. The finding has determined the effect of terrorism on KSE-100 index. The consequence and conversation accomplish that the Pakistan stock exchange has badly affected by terrorism. The capital market would be more effective by the event with increasing violence. The stock market will be more effective when the attack on some political figure as compared to the terrorist attack on common citizens. Moreover, on the capital city by terrorist has more adverse effect on the capital market as compared to other attacks. The tribal area attacks do not affect KSE100 index with big extent even with a large number of death and injuries. Besides the liberation attempt and the efforts of government also perform their character to reduce the effect of the terrorist attack on the capital market.

This paper explores the effect of the terrorist attacks on the stock exchange. Through taking a 10 biggest terrorist attacks in Pakistan, both the ARs and CARs metrics [-7, +7] event window the empirical investigation clearly shows that there is a significant response on the day of terrorist attacks day similarly on days of following the event. In another context, these events were fast and appropriate appears on stock returns. The investigations are continuing with the form of semi strong effective market hypothesis, whereas the finding is anticipated to be high significance for market contribution along with portfolio managers.

Future Research

For the future researcher can be subject the evaluation with different countries, capital markets such as foreign exchange market and bond market. Similarly, we ignored a lot of countries for contrast comparison each country has change market's sizes, Political system, security system, and differ the financial institution structure, then the comparison was not done among the different region and countries. For the future researcher, we leave as well. Our research can produce policy and managerial implication for allocation of the portfolio, national security, security traders and for making policies. By care in opinion the strategies of terrorist attacks, the portfolio can manage by investors, the effect of attacks changed with different location, target type, type of attacks and number of causalities. As we have seen the effect of terrorist attack did not much than one day later. Investors can manage in the light of this result to hold their investment. Terrorism with stock exchange cities has a crucial impact

on KSE performance, then these main cities security should be safe. By the result of this study, the policy of anti-terrorism can be developed. By liberalization, in adding to the replay of the establishment, the collaboration among state Bank, additional institutions, regulatory, and make the stock exchange stronger to counter the terrorism and intelligence agencies are vital to the stock market. Most significantly, there is need to take actions an urgent basis by all the main stakeholders it can really cooperate to developed and improve image terrorist affected countries (Pakistan) to make an impression in the world. Further exploration can cover these implications to examine appropriate strategies of establishment in reply to diverse terrorist tactics from the views of the stock market. Further investigation might also examine behavioral and Psychological procedure that separate experience during like hyper condition and extreme.

References

- [1] Abadie, A. and Gardeazabal, J. (2003) The economic costs of conflict: A case study of the basque country. *American Economic Review* 93(1) 113–132.
- [2] Arin, K.P., Ciferri, D. and Spagnolo, N. (2008) The price of terror: The effects of terrorism on stock market returns and volatility. *Economics Letters* 101(3) 164–167.
- [3] Asal, V., Fair, C.C. and Shellman, S. (2008) Consenting to a child's decision to join a jihad: insights from a survey of militant families in Pakistan. *Studies in Conflict & Terrorism* 31(11) 973–994.
- [4] Barros, C.P. and Gil-Alana, L.A. (2009) Stock market returns and terrorist violence: Evidence from the Basque Country. *Applied Economics Letters* 16(15) 1575–1579.
- [5] Barth, J.R., Li, T., McCarthy, D., Phumiwasana, T. and Yago, G. (2006) *Economic Impacts of Global Terrorism: From Munich to Bali*. Santa Monica, CA: Capital studies, Milken Institute.
- [6] Buesa, M., Valino, A., Heijs, J., Baumert, T. and Gomez, J.G. (2007) The economic cost of March 11: Measuring the direct economic cost of the terrorist attack on March 11, 2004 in Madrid. *Terrorism and Political Violence* 19(4) 489–509.
- [7] Chen, A.H. and Siems, T.F. (2004) the effects of terrorism on global capital markets. *European Journal of Political Economy* 20(2) 349–366.
- [8] Drakos, K. (2010) Terrorism activity, investor sentiment, and stock returns. *Review of Financial Economics* 19(3) 128–135.
- [9] Eldor, R. and Melnick, R. (2004) financial markets and terrorism. *European Journal of Political Economy* 20(2) 367–386.
- [10] Gul, T., Hussain, A., Bangash, S. and Khattak, S.W. (2010) Impact of terrorism on the financial markets of Pakistan. *European Journal of Social Sciences* 18(1) 98–108.
- [11] Gunaratna, R. and Nielsen, A. (2008) Al Qaeda in the tribal Areas of Pakistan and beyond. *Studies in Conflict & Terrorism* 31(9) 775–807.
- [12] Hoffman, B. (2006) *Inside Terrorism*. New York, NY: Columbia University Press.
- [13] Johnston, R.B. and Nedelescu, O.M. (2006) The impact of terrorism on financial markets. *Journal of Financial Crime* 13(1) 7–25.
- [14] Karolyi, G.A. (2006) *The Consequences of Terrorism on Financial Markets: What do we Know?*. Fisher college of Business, Ohio State University, Columbus <http://www.cob.ohio-state.edu/fin/dice/papers/2006/2006-6.pdf>.
- [15] Karolyi, G.A. and Martell, R. (2010) Terrorism and the stock market. *International Review of Applied Financial Issues and Economics* 2(2) 285–314.
- [16] Khokhar, M. (2007) Reforming militant Madaris in Pakistan. *Studies in Conflict & Terrorism* 30(4) 353–365.
- [17] Nguyen, A.P. and Enomoto, C.E. (2009) Acts of terrorism and their impacts on stock index returns and volatility: The cases of the Karachi and Tehran stock exchanges. *International Business & Economics Research Journal* 8(12) 75–86.

- [18] Yehuda, R. and Hyman, S.E. (2005) The impact of terrorism on brain, and behavior: What we know and what we need to know. *Neuropsychopharmacology* 30(10) 1773–1780.
- [19] Zussman, A. and Zussman, N. (2006) Assassinations: Evaluating the effectiveness of an Israeli counterterrorism policy using stock market data. *The Journal of Economic Perspectives* 20(2) 193–206.