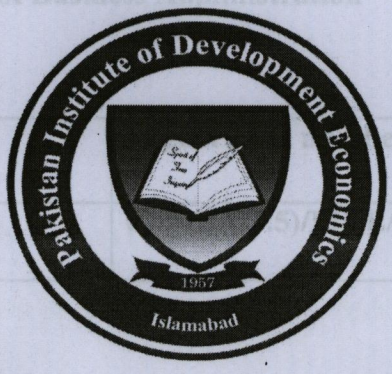
DEPARTMENT OF BUSINESS STUDIES

Pakistan Institute of Development Economics, Islamabad



Impact of Terrorist Incidents on Stock Returns of Pakistan

A Thesis presented to

Pakistan Institute of Development Economics, Islamabad

In fulfillment of the requirement for the degree of

MASTER
OF
BUSINESS ADMINISTRATION

Muhammad Saqib Rashid
03/MBA(3.5)/PIDE/2013

Impact of Terrorist Incidents on Stock Returns of Pakistan

A Post Graduate Thesis submitted to the Department of Business Studies as fulfillment of the requirement for the award of Degree of

Master of Business Administration

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DEDICATION

“I dedicate my thesis work to my family, friends and teachers who specially supported me for the best of my knowledge. Especially to my family who sacrifice for me in all part of my life with having with me by the Blessings of ALLAH (SWT) and my friends who supported me in every part of collecting knowledge. My teachers developed skills in me to do my study and part of thesis.”

ACKNOWLEDGMENT

I am very thankful to Almighty Allah who has all the powers in the world and who also give us power to perform the assigned task, which otherwise we can't perform. I am also obliged to the favors and co-operations made by the respected teacher "Mr. Muhammad Ali Kemal". He helped and guided me in an efficient manner and was always there for me during my period of research. He persistently and persuasively conveyed a character of exploration in regards to research and exaltation in regards to teaching. Without his humble help this dissertation would have not been possible. I whole-heartedly extend my thanks to "Mr. Muhammad Waqas Yousaf", who was always there to help me during my period of research. I would also like to thank the PIDE staff whose unwavering help and moral support in searching material which made this desertion possible.

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ABSTRACT

This study examines the impact of terrorist incidents on stock returns of Pakistan. Daily stock returns have been used, covering period from 2009 to 2016. The study uses trend analysis and event study methodology; a fifteen days event window has been created to examine the effects of terrorist incidents on PSX stock returns. The study finds that terrorist incidents have significant impact on sample Pakistani Capital Market's returns (i.e. PSX-100 returns). This study also documents the reaction of stock returns on the occurrence of terrorist incidents and incorporates the behavior of stock returns according to the category of a terrorist incident i.e. religious, political, and incidents regarding security forces. The study additionally reveals that the results of terrorist incidents show significant negative response after the occurrence of a terrorist incident.

Key Words: Terrorism, Abnormal Returns, Pakistan Stock Market, Event Study, Trend Analysis

CHAPTER I

INTRODUCTION

"No News is Good News" is a prevailing remark by most of the fact finders of different fields including financial researchers. It is well-known fact that stock markets react over some factors even if they are not directly related to the firm's performance. These factors might be a social, economic or political disturbance and may increase or decrease the value of the stock. News reveals information on these disturbances and leaves momentous and historic chain reaction which creates disturbance in the stock markets and leads to structural breaks. These disturbance's payoffs may let someone to put you in other's shoes. Cropping up of news always leaves some structural breaks and information revealed through news is the occurrence of an event. These events can be good or a bad in nature, however, both in nature novelties the historic aspects and become a reason to create seesaws in the market. Moreover, in response to the news, structural breaks occur which can alter a historic trend called alpha shift, which is the depiction of an efficient market. This concept of the efficient market hypothesis was given by (Fama, 1970) that can be further categorized into weak, semi-strong and strong forms of market efficiency. If the past information don't let the investors beget abnormal returns than it is weak form of market efficiency, if the investors beget abnormal returns from the past information and publicly available news than it is semi-strong market efficiency, while the strong form of market efficiency depicts the begetting of the abnormal returns against past, publicly available information and private news.

Stock markets seesaws are aped by sundry events that may be domestic or distant and could be of any category in character. A number diversified event creates vacillates in the stock market and the market may under or over react to these financial and non-financial events. These events might be anticipated or unanticipated and the reaction might be different in both cases. The effect of a nuclear detonation on the

Karachi Stock Exchange (KSE) has also been delved into (Javed and Ahmed, 1999). Further, natural underground eruption's impact on the KSE has also been explored (Javid, 2007). Numerous researchers found that political and terrorist activities are the main source to better stock market as their impact imposed on the country as a whole. The impact of political and economic events impact on the Philippine Stock Exchange has also been investigated (Bautista, 2003). The impact of terrorism activities on the emerging markets has also been scouted out (Arin et al., 2008). In Asia, ten emerging stock market's reaction to the financial crisis has also investigated (Yang et al., 2003).

Trading in stock market is a very unpredictable activity, someone with sound returns at the opening of a market on a new day, may have the end of his wealth at the end of the day. Returns could be very high, high, low or very low or might be negative. Greater the difference in the returns depicts greater the volatility (Sweeney 1998). In the case of a market crash or against the occurrence of an event, Jumps might be generated in returns and volatility. These Jumps are not long lasting, that might become ineffective on the next trading day but the effects of Jumps in volatility may persist, however, the volatility may reverts back to its long run mean (Eraker et al. 2003). In response to certain events causing Jumps in returns and volatility, effects can be observed through Co-Breaks. A thread of literature illustrated the significant impact of the terrorism, political and financial crisis stock returns and volatility of the stock returns.

1.1 Events History in Pakistan

Since the Pakistan came into being a number of political instabilities are occurring. After the 4 years of independence first Prime Minister of Pakistan was assassinated in 1951. The history of dictatorship started after the 11 years of the independence of the Pakistan. In 1958 first martial imposed in Pakistan and Constitution of 1956 was abrogated. The dictatorship regime continued for next 12 years. In 1970 first ever general election took place to lead to a civil war ends at the breakaway of East Pakistan to become Bangladesh in 1971. A democratic regime started in 1973 which

ends after two years when once again martial law being imposed and dictatorial regime continued for 11 years in 1988. After the general election of 1988 a democratic regime started that was also dismissed in 1990 and a period of autocratic regime started which ends at the 1990 general elections, 1993 lead to another general election with resignations of democratic government, 1996 start of an autocratic regime lead to the 1997 general election in which a new democratic regime started. In 1999, dismissal of a democratic government leads to an autocratic regime which ended in 2008 after the general election. The political history of the country shows a number of instabilities.

Political decision makings, stabilities, and instabilities also play a major role in the economic structure of a country. In the same manners stock market also behaves in a different way under different political situations. Different governing structure depicts the different stock behavior. In Pakistan case, there is a number of major changes have taken place past 15 years regarding regime shifting between autocratic and democratic regime. A trend has been observed in the country that new government hardly continues with the previous government policies (Express Tribune 2014)[1]; democratic and autocratic governments adopts different policies in terms economic, foreign and internal affairs. KSE depicts the behavior of the people when a new government came in power (Geo News 2013)[2].

Pakistan holds a great importance due to its geographical boundaries as it stretched between the Arabian Sea to the range of Karakoram Mountains with 6th largest population among 196 countries of the world and land fully enriched by a number of natural resources. Pakistan is surrounded by the Iran, Afghanistan, China, and India. Pakistan shares it's 2250 km and 2900 km of borders in length with Afghanistan and India respectively. Indo-Pakistan border named Line of Control found to be the 2nd most sensitive border in the world due to the Occupied Kashmir Issue and both of the countries have fought three wars over this issue that's why there are a number of instabilities in both countries on the account of Occupied Kashmir Issue.

1 http://tribune.com.pk/ October 2, 2014
2 http://geo.tv/ 13 May, 2013

Moreover, civil wars in Afghanistan since 1989 directly or indirectly also affect the stability of the adjacent countries especially the Pakistan. Due to the tightness on Line of Control and civil wars in neighboring country, a number of challenges like terrorism have risen in Pakistan in past as the external forces also pay a major role in creating instabilities in the country (Ahmar, 1996).

Terrorism has become a serious problem in Pakistan since the incident of 9/11 as reluctantly Pakistan has become the front line of NATO Alliance. Therefore, the cost that it has to pay was the severe terrorist attacks, which were increased in 2004 when the United States of America declared it as a Major Non-NATO Ally. Although, Pakistan is facing the issue of terrorism since it has come into being, but the intensity of the terrorist attacks has risen by 5.1 times in comparison to last 14 years and last 44 years. According to the Global Terrorism Database,[3] 9659 number of a terrorist incident have taken place in Pakistan from 2004 to 2014 with at least 16554 casualties and more than 29083 injuries, whereas from 1970 to 2000, only the number of terrorist events was 1863 with 3391 causalities. Every time a terrorist attack takes place it leaves a long lasting psychologically disturbing situation and left some bad memories to raise a number of terrorists.

According to the Express Tribune (2014), [4] the economic cost of War on Terror was $102.5 billion. Moreover, sectarian and ethnic conflicts are also playing a major role in terrorism. Terrorist events have always left an impact not only in terms of the loss of lives and in monetary terms, but it also has a psychological impact by creating fear and uncertainty which prevails for a long time. The terrorist attack on an educational institute leaves a situation of uncertainty for the other educational institution. While, terrorism attack on a business activity drags another investor to shut down the business activity. Terrorism events are taking place in Pakistan almost on daily basis. In the presence of ethnic and sectarian groups, one external disturbance creates more disturbances originated by some inside factors. One terrorist attack on a religious place

3 http://www.start.umd.edu/gtd/ (accessed in December 2015)
4 http://tribune.com.pk/ (accessed in December, 2015)

gives birth to other sectarian attacks. These types of events are responsible for closing institutional and business activities which will resultantly have a harsh impact on the stock market. Stock markets backlash in response to a terrorist attack depending on its intensity. This intensity can be depicted by the number of casualties, injuries, responsible group and target group and through the weapon that is used in a terrorist attack.

Situations in which financial institution lose a huge part of their value is known as Financial Crises. Federal Reserve System (FED) started decreasing interest rate from 6 to 1.5% in 2001 to save the market crash and unemployment. Generally, interest rate decreased to enhance the investment however, behavior of investor have a tendency to invest in real estate business, as the FED could not sustain lower level of interest rate anymore where more borrowings could not be entertained to pay back previous borrowings which become one major reason among others of the crash down of Lehman Brothers and Frennie May and Freddie Mac and overall situation lead to the Global Financial Crisis in 2008. Shortly, it was due to the series of wrong decisions regarding mortgage which leads to crash in financial markets. From this example we can understand the impact of a decision (event) on the financial market. It can crash the financial system nationally and internationally. In this era of Globalization, effects of these crises transferred to all those countries linked with International Market.

This study is mainly concerned with the PSX and the internal events taken place in Pakistan. PSX did not reflect any strong pieces of evidence on any prominent under or overreaction during and after the Global Financial Crisis (Sohail & Javid, 2014). This could be explained by the fact that as Pakistan has a very small share in the International Market. Sohail (2009) ensures the presence of three intense financial crises in KSE and LSE-25 in March 2005, May 2006 and May 2008 to Jan 2009 respectively due to the market crashes. This can be stated that Financial Crises in Pakistan might be reasoned by some other factors.

Pakistan Stock Exchange (PSX) established on September 18th, 1948 and among of the most matured stock exchanges in South Asia. According to the Javid (2007), it is a leading stock market in Pakistan as the 75 to 80% of the current trading takes place in Karachi Stock Exchange, and it consists of 38 different sectors. Islamabad, Lahore, and Karachi Stock Exchange are combined named as Pakistan Stock Exchange (PSX)[5]. PSX (2014) [6] cited that there are 557 numbers of companies that are listed with the rupees in million, with total market capitalizations as 7,380,531.74.

In the light of all above discussion Pakistan has been chosen as a vehicle of empirical research work because it is one of the ideal places in the present context of this study. As there are a number of political fluctuations in the governing system and regime shifting have taken place last decade. Moreover, Pakistan is also the Major Non-NATO Ally since 2004 that's a major reason behind number of terrorist attacks taking place in Pakistan. PSX is unified stock market in the country that's why companies of different sectors listed with PSX were chosen as the sample.

1.2 Research Questions

1. Do terrorist incidents produce any informational value?
2. How returns of PSX react over the Terrorism Events?
3. Do terrorist incidents negatively affect the stock returns?

1.3 Objectives of the Study

The core objective of this study is to examine the effect of the different terrorist events on the stock returns of PSX. This study also examines the reaction of the 8 years (2009 to 2016) over the occurrence of Terrorism Events under the event study methodology.

5 http://www.dawn.com/news/1232253
6 http://www.kse.com.pk/ (accessed on June 23, 2015)

1.4 Research Gap:

This study is distinctive from the other studies, in other studies, researchers have mostly used small sample of data or only the major terrorist incidents but in this study 128 terrorist incidents have been taken as a sample to test the research questions. This study has also incorporated the category of an incident i.e. Religious, Political, attacks on Security forces and incidents in the major cities of Pakistan. Not only the overall impact of a terrorist incident is examined over the stock returns, but also the impact according to the type of incident is also examined in this study. On the other hand, trend analysis over time from 2009 to 2016 is analyzed with the impact of events over stock returns. In this way, as there is always some room available for the improvement, so this study covers the maximum gap which is not being covered in the past studies.

1.5 Research Significance:

This is necessary to know the financial concerns due to terrorist incidents. This study is important in a way that it assists in planning policies, while incorporating the impact of terrorist incidents on stock returns. This study, on completion, will help the stakeholders, managers and policy makers in their specific tasks. It will help investors in creation of an improved portfolio, which integrate the threat of terrorist incidents. This will also help the managers in making various choices i.e. subcontracting, forecasting, and insurance of assets due to future risk of terrorist incidents. Resultantly, this study is also important to the government institutions in a way that it helps in creation of long-term policies with incorporation of the risk due to terrorist incidents. Similarly, government's struggles to avoid terrorist incidents could be seen by other countries and it will help the government in achieving the strategic goals.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter reviews the relevant literature. Particularly, literature relevant to the impact of terrorism events, political events and financial crisis on series of return and volatility discussed along with the modeling and methodology. Moreover, an attempt is made to explore the literature relevant to the variables considered and in the context of Pakistan. In the first quarter of this literature impact of different events on Karachi Stock Exchange discussed, while in the second quarter compatibility of considered events checked in the light of literature, in third quarter methodologies that can be adapted has been discussed, while in the last and final quarter of this chapter gap for this discussed.

Javed and Ahmed (1999) examined the effect of nuclear experiments in India and Pakistan, on the average returns, volume and the volatility of Karachi Stock Exchange. ARCH model is being used for the analysis of daily data of KSE. Study results reveal that nuclear experiments in India significantly and negatively affected the returns and trading volume when volatility also increased. However, Pakistan's nuclear experiments did not significant impact on the returns, in times when volatility and trading volume has increased.

Javid (2007) have studied that impact of a natural disaster, 8th October, 2005's earth quake on volume and capitalization of the sixty firms of Karachi Stock Exchange. For this purpose GARCH modeling is being used to check the impact of catastrophic changes on average return, trading volume and volatility. The results depict a rise in returns of cement, steel, food and banking as an individual can predict a rise in the demand of the goods of the relevant sectors. However, no significant volatility observed.

Jhonston et al. (2005) elucidated the significant impact of 9/11 World Trade Centre terrorist attack on 14 different stock exchanges. Study illustrates that the markets are efficient to absorb the impact of this attack, different stock exchanges rebounds in different number of days. Such as Hong Kong stock exchange rebounds in 6 days which is earlier than any other market, whereas the Johannesburg rebounds in 162 days which is later than all other markets.

Irshad (2011) theoretically investigated that Pakistan has squeezed in war on terror between the Afghan Jihadi Militants and United States of America. Pakistan's war on terrorism is deteriorating economy by decreasing investment and increasing inflation. Moreover, it is also creating a situation of uncertainty for the investors and for general public.

Erb et al. (1996) constructed a study to find out the relation between the five different measures of country risk and expected future returns for 117 countries. These countries were categorized based on equity markets. The study reveals that these country's' risk measures are correlated with equity returns and are highly correlated with the equity valuation measures.

Sesay (2004) investigated impact of conflicts in the neighboring countries on the economic growth of country, for this purpose 72 developing counties considered for investigation. Results of the panel data concludes that conflicts in the neighboring country do not the affect the economic growth of a country alone, however it also an influence on the growth in the neighboring countries.

Nguyen et al. (2009) found the effect of terrorism on the two different stock exchanges located in Pakistan and Iran, for both returns and volatility, GARCH (1,1) is being employed for the analysis. The results state that Karachi Stock Exchange is more reactive to the terrorist attacks taken place in different countries other than Pakistan and Iran. However, the terrorist attacks relevant to World Trade Centre and Madrid

have a significant impact on returns for both counties, while terrorist attack in London has significant impact on the volatility series of both the counties.

Ahmed et al. (2008) ascertained the significant impact of 9/11 terrorist attacks on Karachi Stock Exchange. The study illustrates that the behavior of stock volatility was different from the pre attack period whereas volatility of the stock shows a significant reaction in post attack period.

Aslam et al. (2015) have examined the impact of terrorism activities on the volatility and returns of the Karachi Stock Exchange. For this study 330 terrorism events has selected and empirically significance of terrorism events on volatility measured in the categories of Event Day Analysis, Location Wise Impact of Terrorism Events Analysis, Event Type and Target Type by Events Analysis through EGARCH Modeling. Result depicts a significant impact of terrorism activities on the volatility of the KSE-100 Index and market recovers to the normal point one day.

Hassan et al. (2014) have studied the impact of most severe terrorism events for the decade of 2000 on KSE-100 companies by differentiating the firms of into different sectors. Three events, fist one is the assassination of Chairman of Pakistan People Party, second Darra Adam Khel Attack and third is Marriot Hotel Attack were considered in the analysis. Events study methodology concluded that all three events have significant impact on the sectors of the KSE-100 Index.

Aslam & Kang (2015) examined the impact of 300 major terrorism events on the KSE-100 index daily data. Researchers have concluded through event study methodology that terrorist attacks have negative impact on KSE-100 daily data. However the market recovers to its normal point in one day time. Study based on the Event Day, Location, Casualties and Attack Type analysis.

Zach (2003) has examined that effect of political events, can be categorized as foreign affair on Israel Stock Market TAD-100 (Tel Aviv) and ISRIX (Israel Stock in US). The results have shown that the reaction of TAD-100 and ISRIX is different for the

companies that are not cross listed over the Political Events, for those that are peace talks between Arab Nations and Israel where the results for cross listed companies behaves in a same way. Study shows that the returns are more extreme on the event days compare to a normal day.

Beaulieu et al. (2005) developed a study to find out the impact of different political events in Canada on the volatility of the returns of 102 numbers of firms listed in Montreal Stock Exchange and Toronto Stock Exchange. The results of the study illustrates that political news do have a significant impact on the volatility of the stock returns.

Dangol (2008) investigated the impact of anticipated and un-anticipated political events on Nepalese Stock Exchange, the study illustrates that by using event study methodology, good political events and bad political events is a reason to generate positive and negative abnormal returns respectively. The rebounding period of the market against the new information related to the political events is 2 to 3 days.

Clark et al. (2008) made analysis of stock market reaction for political events from 1947 to 2001. Primary data is used, collected from different politicians, economists and stock markets analysts. Under the Bayesian Modeling and Monte Carlo techniques it is being observed that political risk lies between 10.725% and 16.725% which has affected the Karachi Stock Exchange.

Mahmood et al. (2014) investigated the impact of different political events on KSE-100 index from 1998 to 2013. For this purpose 60 days event window designed, that consists of abnormal returns and commutative abnormal returns. The results of the event study shows that market fluctuates over the occurrence of the events. Moreover, the selected events have significant negative relation with the political instabilities.

Khalid et al. (2010) analyzed the impact of political events categorized into domestic (regime shifting etc.) and international events on financial market from 1999 to 2006. Three financial indicators used to check the impact of the political events. The

results illustrates that the volatility of the indicators significantly reacts over the occurrence of the political events, however there is no long terms linkages.

Mei et al. (2004) investigated that relationship between the financial crises and political events i.e., elections and transition periods for 22 emerging markets. The results state that there is a significant relation between political events and financial crises. Moreover the volatility also increased during the elections and transitions periods. However, out of nine, eight financial crises have taken place during political elections and transition periods.

Jin and An (2016) analyzed the behavior of US stock markets to BRICS stock markets during global financial crises. The results stats that markets are interrelated with each other, therefore the volatility in stock markets of BRICS countries increased. A positive significant impact on the volatility of stock returns of the BRICS is being observed during the financial crises events. However, the volatility in response to large shock and persistence has also been observed.

Sohail & Javid (2014) developed a study for investor's behavior in Karachi Stock Exchange during global financial crises events. The study further divided into financial and non-financial sectors. The results explains that during global financial crises, financial sector shows highly significant results in 12^{th} and 24^{th} week, where the non-financial sectors shows undervaluation throughout the period except the first week but results remains insignificant.

For the residual analysis, ARCH/GARCH modeling has become much successful in financial modeling. A number of researcher use univariate and multivariate ARCH/GARCH family models for volatility clustering and residual analysis. Tse (1991) used ARCH/GARCH modeling for the volatility in Tokyo Stock Exchange. In purpose to investigate the persistence of a shock, GARCH models are being employed (Chou, 1988). Financial decisions depend on returns and risk, for capturing the ARCH and GARCH models are being employed (Engle, 2001). Campbell and Hentschel (1992) employed

Quadratic GARCH model to asymmetries, to find positive and negative skewness and excess kurtosis. Karolyi (1995) employed multivariate GARCH model for international transmission of volatility and stock returns.

Event study methodology is among one of the oldest and widely used techniques all over the world. Jong et al. (1992) discussed a number of event study situations to find out the weekend and option expiring effect. Binder (1998) discussed a number of event study methodologies. Most of the time a nonparametric event study methodologies are employed in which abnormal returns are calculated (Crowan, 1992). Both, Capital Asset Pricing Model (CAPM) and Mean Adjusted Returns Model (MARM) can be employed for the calculation of the abnormal returns (Cable and Holland, 1999) and (Strong, 1992).

Impulse Indicator Saturation is used to capture out the breaks in series and co-breaks in two series. Hendry (2001) used this general to specific technique for modeling inflation UK. Russell et al. (2010) used this technique to capture the structural breaks. Doornik et al. (2014) used this methodology to capture the level shifts or multiple breaks. Reade and Volz (2011) employed this methodology to model inflation for China along some other macroeconomic variables including stock market growth.

Although, there a lot of literature related to this study however it is comparatively different from the others as it specifically differentiates that how different sectors of Pakistan Stock Exchange reacts in the presence of numbers of instabilities, it is important to know the behavior of investor. Therefore, three different types of events are being taken into account and the effect of these different events is considered for the analysis under different employed methodologies.

2.1 Market efficiency

The Efficient Market Hypothesis (EMH) depends on the supposition that, in effective markets, asset prices completely reveal all the accessible data or information. Accordingly, any adjustment in equilibrium prices will be because of the stream of data or information accessible to market contributors. In this way, if one acknowledges that

market balance conditions are converted into expected returns and that these are framed on the premise of the accessible data, no framework could be invented to empower abnormal returns (i.e. returns in overabundance of expected market returns) to be acquired (Malkiel, 2003). Another method for taking a glance at this issue is that if any type of consistency could be identified in the market, it would demonstrate wasteful data or information stream and for this situation a framework could be conceived to empower somebody to acquire abnormal gains.

Market efficiency can be classified into three types: (i) Weak form: it is a type of efficient market in which the accessible information is based on the historical data. (ii) Semi-strong form: this is a type of market in which the latest and apparent information which is accessible to the public is added to the past set. (iii) Strong form: this form of efficient market considers the information which is not accessible by the public but detained by the private groups (Fama, 1970).

Fama (1970) additionally recognizes adequate (however not obligatory) conditions for capital market efficiency (Montibeller, Belton, Ackermann, and Ensslin, 2007), as follows:

- Nonexistence of transaction costs;
- All info is accessible to all market contributors at no cost;
- All market contributors concede to the meaning and implications of the accessible data or information.

As far as the process of collecting evidential data to test semi-strong type of market efficiency is concerned; the literature explains it with the speed at which market prices are changed with the change in accessible data or information (Dimson & Mussavian, 1998).

Event study is an approach or a research method, which is mostly used in this area (Camargos & Barbosa, 2003; MacKinlay, 1997). This type of methodology is used to collect the evidence that market prices do not change instantly with the change in

accessible information, and assist to ascertain clusters of abnormal returns near to the event (merger and acquisition, stock splits, alteration in the rates of interest, announcement of alterations in macroeconomic indicators, etc.) (Gersdorff & Bacon, 2009; Seiler, 2003; Wong, 2002).

Still, the values given by these market models is arguable, it is commonly perceived that a methodology based on market models enhances the knowledge about markets (MacKinlay, 1997).

As a rule, significant and positively induced "Total Standardized Abnormal Returns" after the occasion date show that the market was not sufficiently efficient in engrossing the uplifting news that was released. On its part, significant "Cumulative Total Standardized Abnormal returns" after the occasion date would imply that value was still being formed through increase in prices, therefore directing towards market inefficiency in terms of entire adaptation of the good news bearing amazements (Fama, 1970).

Moreover, if the significant and also positive values of Total Standardized Abnormal Returns are not matching the event date i.e. the day when news of merger is expected to be issued, a significant and also positive value of Total Standardized Abnormal Returns will be due to the information leakage and this could also be due to the inefficiency of the market i.e. due to gains that are not the result of the action of the market on public news, since the information about merger would not yet be public at the time (Fama, 1970).

This study is different from the previous studies, in a way that event study is applied to examine the impact of terrorism incidents on stock returns of PSX-100, while taking a time span of last 8 years i.e. 2009 to 2016. In this study, recent data has been taken to inspect the impact of terrorism incidents on stock returns, and the events have been categorized according to their nature i.e. religious, political, security forces. On the other hand, the element of major cities has also been incorporated to see if the impact

vary from city to city i.e. Lahore, Rawalpindi, Karachi, Quetta and Peshawar. So, this division of incidents and the use of recently occurred incidents, make this study different from the previous studies.

CHAPTER III

MODEL SPECIFICATIONS AND DATA DESCRIPTION

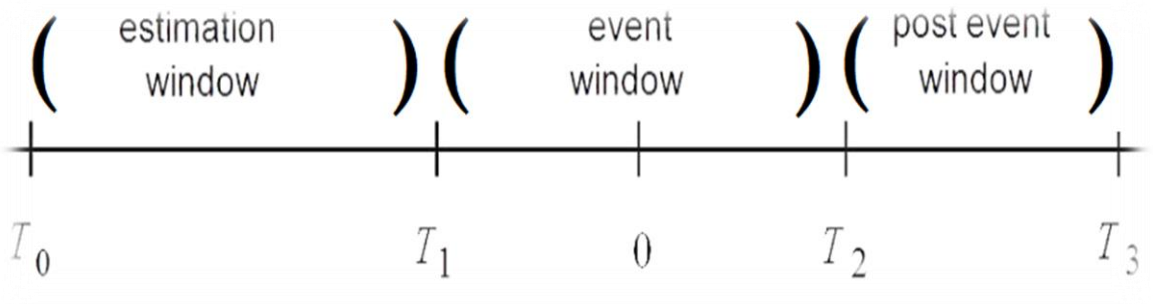
In this chapter, model specifications acquainted in the first section. In the second section, the data description, in which criterions for selection of the variables are elucidated. Moreover, definitions specifically for terrorism and are delineated; sources of data are furnished at the end of the second section.

3.1 Model Specifications

Modeling embraces a substantial importance, as it has adeptness to deliver the facts and proofs to support the theories, evading the uncertainties and delivers us with some directions to deal with the problems. Therefore, the specifications of the models of which to be used to support this study are discussed in this section.

3.1.1 Event Study

Event study is among one of the oldest and widely used technique to check out the significance of the events on the stock returns. Dolley (1933) used this technique for the stock splitting. Event is being used to check the impact of different Events on the prices of the underlying assets, therefore event study can be used for almost all kind of the events that are may be firm specific, social, economic event or political events. This method helps us to check the significance of an event individually and also used as to check the significance of a group of similar events. Event window which basically defines that within that period an event has occurred, and compare its results with estimation window which basically provide us with the information of the pre event window, after that we calculate the abnormal returns which actually depicts a difference between expected returns and actual returns within the event window for an underlying firm, sector or index than go for the significance of the abnormal returns. Following diagram is depicting the methodology framework of event window study:



(Figure 3.1: Event Window Study)

Calculation of the Returns

Since the study ascertain the impact of terrorist events on stock returns, so the first step is to calculate the returns. Financial data series may have some trends most of the times therefore the issues of non-stationary and non-normal distribution can arise. Hence, the returns for each section will be calculated to avoid the issues of non-stationary and non-normal distribution. Logarithmic returns are calculated followed by the given formulas:

Logarithmic Returns $$\mathbf{R_{i,t} = In\left(\frac{P_{i,t}}{P_{i,t-1}}\right)}$$

Where:

$\mathbf{R_{i,t}}$: Returns of sector **i** time **t**

$\mathbf{P_{i,t}}$: Closing price of sector **i** on time **t**

$\mathbf{P_{i,t-1}}$: Closing price of sector **i** on time **t-1**

Strong (1992) stated that theoretical and empirical evidence turns one's choice rational towards choosing the logarithmic returns, as they are close to the normal

distribution. Therefore, the logarithmic returns being chosen to obtain the returns series. Moreover, the dividend paid will not be included for the calculation of the returns as the Nelson (1991) concluded that, for the calculation of the index returns, interest rate and dividend paid do not cause a significant effect.

Calculation of the Abnormal Returns

The abnormal return reveals the response over one precise event at a specific point of time. The daily abnormal returns are calculated as difference between actual returns and expected returns for an individual event.

$$\mathbf{AR_{i,t}} = \mathbf{R_t} - \mathbf{E}\left(\mathbf{R_{i,t}}\right)$$

Average Abnormal Returns (AAR)

Average Abnormal Returns (AAR) calculated because it gives overall impact of one type of events in the model, AAR obtained by taking the average of all the abnormal returns related to a particular event, can be given as in the equation:

$$\mathbf{AAR_{i,t}} = \sum_{\mathbf{i=1}}^{\mathbf{N}} \mathbf{AR_{i,t}} \times \mathbf{n^{-1}}$$

Where;

$\mathbf{AAR_{i,t}}$	:	Average Abnormal Returns of sector $\mathbf{i}$ on time $\mathbf{t}$
$\mathbf{AR_{i,t}}$	:	Abnormal Return of a sector $\mathbf{i}$ on time $\mathbf{t}$,
N	:	Number of events

The t-statistics is employed to test whether the AARs are significantly different from zero or not.

$$t - stat = \frac{AAR_t}{SE(AAR_t)}$$

$$SE(AAR_t) = \sqrt{\frac{(AAR_t - \overline{AAR})^2}{n-k}}$$

3.1.2 Trend Analysis

After examining the impact of terrorist attacks on stock returns of stock market of Pakistan, the trend analysis is conducted to examine the relationship between impact of terrorist attacks and time.

In this study, trend analysis is conducted while inserting graphs on Microsoft Excel. In the graphs, time (i.e. time period from 2009 to 2016) is taken on horizontal axis while the impact of terrorist attacks on stock returns of stock market of Pakistan (abnormal returns) on vertical axis. After inserting these graphs, trend line is plotted on each graph, so that the relationship between time and impact (i.e. either the impact increases or decreases with the passage of time or not) could be examined while checking the slope of trend line.

3.2 Data Description

The study is based on assorted dataset. The entire sample having terrorism events is extracted from “South Asia Terrorism Portal" data source. Terrorism events selected according to definition of the terrorism in the International Laws.

According to UN Document*, Walter (2009)* defined terrorism as:

Criminal acts intended or calculated to provoke a state of terror in the general public, a group of persons or particular, persons for political purposes are in any circumstance unjustifiable, whatever the considerations of a political, philosophical, ideological, racial, ethnic, religious or any other nature that may be invoked to justify them.

After analyzing the data, we came to know that we have 128 number of events. All the events selected (from the last 8 years i.e. 2009 to 2016) according to the different criteria being designed according to the definition of the events.

We have also categorized the terrorist attacks, to examine the impact of terrorist attacks on stock returns according to the nature of terrorist attacks i.e. if an attack is of religious or political nature then how significantly it affects the stock returns of stock market of Pakistan, and if an attack is target on security forces then how significantly affect the stock returns. Similarly, terrorist attacks in the major cities (i.e. Rawalpindi, Lahore, Peshawar, Karachi and Quetta) are also viewed independently to examine their impact on stock returns of the stock market of Pakistan.

We have made a criterion for the selection of terrorism events based on the number of causalities in the terrorist attacks. The sample of this study is chosen as all the events in which the number of causalities is 10 or more than 10. The indices used in this study, to calculate the stock returns and market returns, are taken from Pakistan Stock Exchange (PSX) data source.

CHAPTER IV

RESULTS AND DISCUSSION

4.1 Empirical Results

In this part, the detailed exploration and examination is conducted on the data which is explained in the previous chapter. This detailed analysis is conducted on the basis of the research methodology displayed in Chapter III.

The following table portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window of all sample Terrorist Attacks from 2009 to 2016.

Table 1: Average Abnormal Returns (AAR) and t-stat of All Terrorist Attacks (n=128)

Days	AAR	t-stat AAR
-7	0.0000833	0.8478252
-6	-0.0000243	-0.3489610
-5	-0.0000646	-1.1000847
-4	-0.0000494	-0.7869878
-3	0.0001500	1.2918907
-2	-0.0000411	-0.6322278
-1	-0.0001232	1.1307148
0	-0.0000252	-0.3639604
1	0.0000577	0.6315677
2	0.0000574	0.6282988
3	-0.0004502	-10.1565449***

4	-0.0001955	-8.2336457***
5	-0.0000940	-1.8485330*
6	0.0002583	1.7810497*
7	-0.0000699	-1.2187584

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 1 mentioned above contains the particulars of average abnormal returns (AAR) and t-statistics for 15-days event window about the overall terrorist attacks in the last 8 years i.e. 2009 to 2016. The above table depicts the negative average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, though this average abnormal return (AAR) is not significant i.e. it is not much away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 1 also shows that the value of t-stat is negative but not much significant on “day 0” which is the event day. As the average abnormal returns (AAR) and t-stat values on 3rd, 4th and 5th day after the occurrence of terrorist event are negative and also significant, so it can be ascertained that there is a significant effect on stock returns after the occurrence of terrorist attacks on PSX-100 index returns.

This result can definitely represent that terrorist attacks have informational value. Figure 1 shows the change in average abnormal returns and the changing behavior of stock returns.

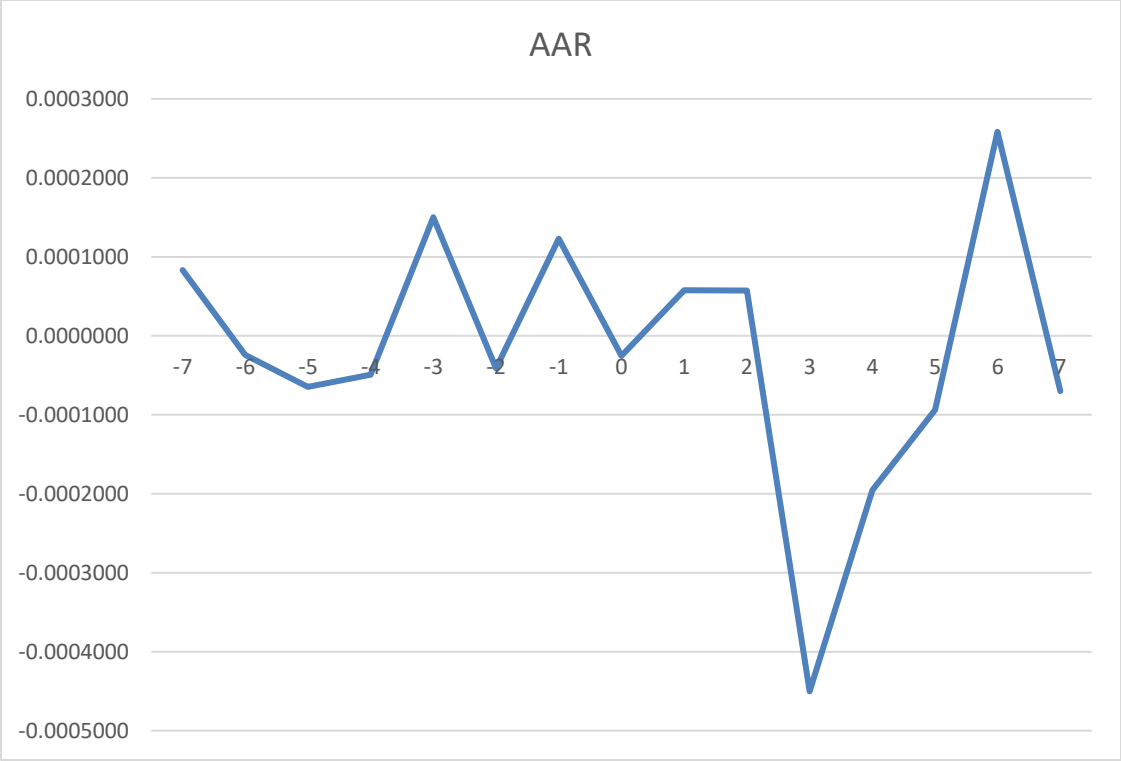


Figure 1: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following table portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks in Rawalpindi.

Table 2: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks in Rawalpindi (n=4)

Days	AAR	t-stat AAR
-7	0.0010159	17.4654959***
-6	-0.0009095	-1.5879437
-5	-0.0007864	-1.4566862
-4	-0.0010655	-1.7341461
-3	0.0000623	0.1988722
-2	0.0021670	8.6859849***
-1	0.0008080	7.1057104***
0	0.0008273	7.6200437***
1	0.0002867	1.1332243
2	-0.0002279	-0.5834995
3	-0.0002515	-0.6337859
4	-0.0011056	-1.7685580*
5	0.0007078	5.0369485***
6	-0.0000125	-0.0375600
7	-0.0002824	-0.6970993

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 2 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks in Rawalpindi. The above table shows positive average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, though this average abnormal return (AAR) is significant i.e. it is away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 2 also shows that the value of t-stat is positive and also significant on day 0 i.e. the day on which event occurred. As the average abnormal returns (AAR) and t-stat values reduced to negative on 2nd and 3rd day after the occurrence of terrorist event, but on 4th day after the occurrence of terrorist event these values are negative and also much significant so it can be ascertained that there is significant effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks in Rawalpindi.

This result can definitely represent that terrorist attacks have informational value. Figure 2 shows the change in average abnormal returns and the changing behavior of stock returns.

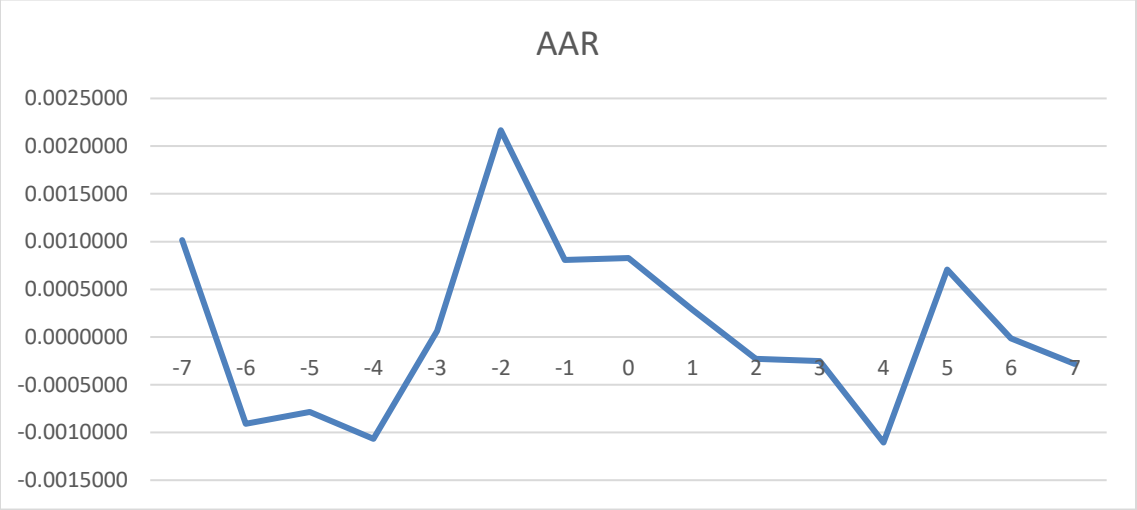


Figure 2: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following able portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks in Lahore.

Table 3: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks in Lahore (n=10)

Days	AAR	t-stat AAR
-7	0.0002198	23.7112488***
-6	-0.0001747	-1.5233724
-5	-0.0001945	-1.6210914
-4	-0.0009905	-2.9768726**
-3	0.0014729	4.5231119***
-2	-0.0008726	-2.8968599**
-1	-0.0003730	-2.2241742**
0	0.0000158	0.2471953
1	-0.0000345	-0.4466234
2	0.0000691	1.3945443
3	-0.0005627	-2.5765086**
4	0.0004796	7.9712862***
5	-0.0001303	-1.2672079
6	-0.0000076	-0.1090236
7	0.0013378	4.6204999***

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 3 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks in Lahore. The above table shows positive average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, though this average abnormal return (AAR) is not significant i.e. it is not away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 3 also shows that the value of t-stat is positive but not significant on day 0 i.e. the day on which event occurred. As the average abnormal returns (AAR) and t-stat values reduced to negative on 3rd day after the occurrence of terrorist event and are also significant, so it can be ascertained that there is significant effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks in Lahore.

This result can definitely represent that terrorist attacks have informational value. Figure 3 shows the change in average abnormal returns and the changing behavior of stock returns.

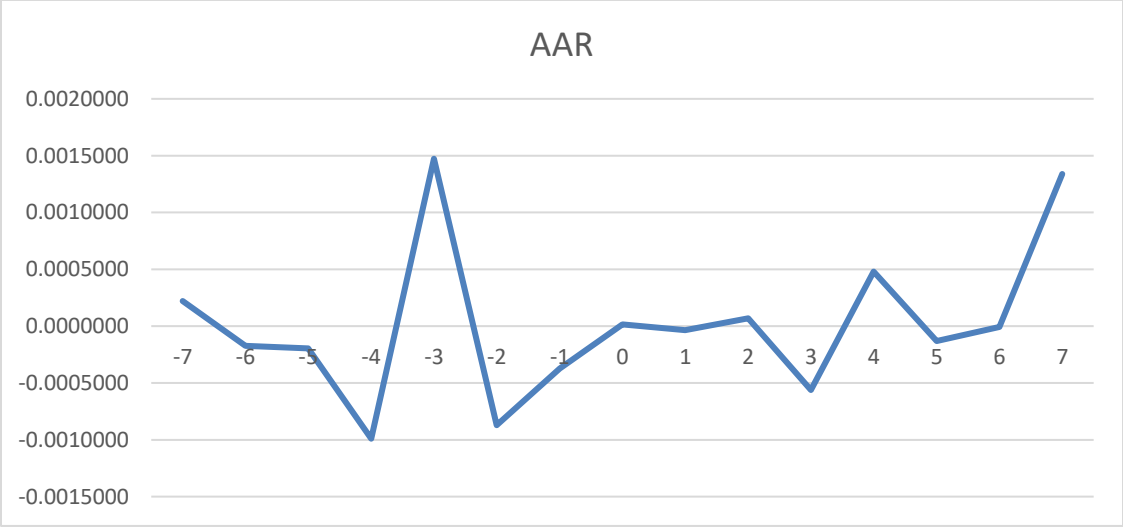


Figure 3: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following able portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks in Peshawar.

Table 4: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks in Peshawar (n=21)

Days	AAR	t-stat AAR
-7	0.0003145	1.4612943
-6	-0.0000026	-0.0198206
-5	-0.0005007	-18.8733992***
-4	-0.0000183	-0.1450407
-3	0.0000082	0.0616780
-2	0.0003417	1.5357109
-1	-0.0002686	-4.5232193***
0	0.0000917	0.5889501
1	0.0001481	0.8671545
2	0.0002225	1.1672117
3	-0.0008217	-9.2903621***
4	-0.0002657	-4.4179041***
5	-0.0003442	-8.7898359***
6	0.0005813	2.0287888*
7	0.0000232	0.1687162

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 4 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks in year Peshawar. The above table shows positive average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, though this average abnormal return (AAR) is not significant i.e. it is not away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 4 also shows that the value of t-stat is positive but not significant on day 0 i.e. the event day. The average abnormal returns (AAR) and t-stat values after the occurrence of terrorist event are positive but not significant on 2nd day after the occurrence of terrorist event, but on 3rd, 4th and 5th day after the occurrence of terrorist event, these values are negative and also much significant so it can be ascertained that there is significant effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks in Peshawar.

This result can definitely represent that terrorist attacks have informational value. Figure 4 shows the change in average abnormal returns and the changing behavior of stock returns.

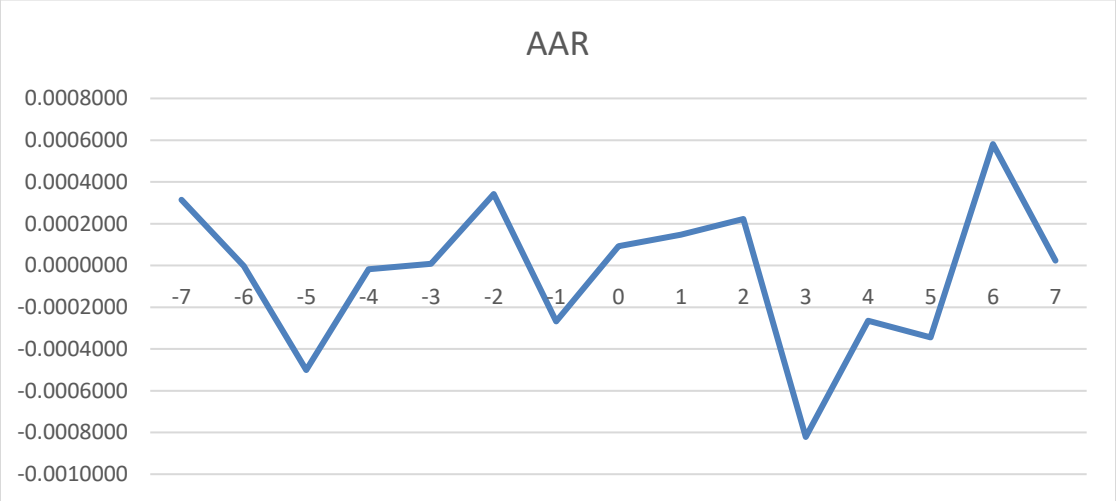


Figure 4: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following able portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks in Karachi.

Table 5: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks in Karachi (n=3)

Days	AAR	t-stat AAR
-7	0.0017799	1.0605874
-6	0.0018356	1.1035743
-5	0.0010913	0.5859882
-4	0.0009495	0.4996682
-3	0.0008218	0.4248314
-2	-0.0003917	-0.1734125
-1	0.0003527	0.1712271
0	0.0001221	0.0575398
1	-0.0000270	-0.0125118
2	0.0013254	0.7364221
3	0.0000108	0.0050045
4	-0.0007359	-0.3130790
5	0.0008538	0.4433710
6	0.0006982	0.3549152
7	-0.0006270	-0.2700835

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 5 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks in Karachi. The above table shows positive average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, though this average abnormal return (AAR) is not significant i.e. it is not away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 5 also shows that the value of t-stat is positive but not significant on day 0 i.e. the event day. The average abnormal returns (AAR) and t-stat values are negative but not significant on 1st day after the occurrence of terrorist event, so somehow it can be ascertained that there effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks in Karachi, but this effect is not significant.

This result can definitely represent that terrorist attacks have informational value. Figure 5 shows the change in average abnormal returns and the changing behavior of stock returns.

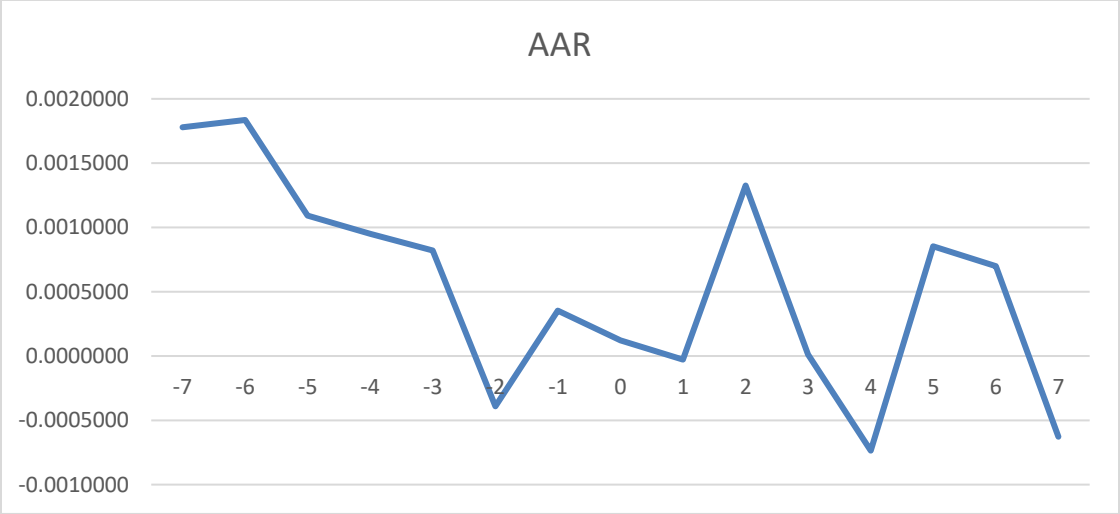


Figure 5: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following able portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks in Quetta.

Table 6: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks in Quetta (n=13)

Days	AAR	t-stat AAR
-7	-0.0006621	-2.5316616**
-6	-0.0001884	-1.3960722
-5	-0.0003506	-1.9665486*
-4	-0.0002116	-1.4992508
-3	0.0002709	22.2467637***
-2	0.0004169	15.5269135***
-1	-0.0001040	-0.9252238
0	0.0005340	9.1853013***
1	0.0000976	1.6675185
2	0.0002189	8.4008967***
3	0.0005239	9.4491125***
4	-0.0001379	-1.1358423
5	0.0001423	3.0577309***
6	0.0000744	1.1500369
7	-0.0003079	-1.8452790*

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 6 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks in Quetta. The above table shows positive and significant average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 5 also shows that the values of average abnormal return and t-stat are positive and also significant on day 0 i.e. the event day. As the average abnormal returns (AAR) and t-stat values are significant and also positive after the occurrence of terrorist attack, so it can be ascertained that there is not any significant effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks in Quetta.

This result can definitely represent that terrorist attacks do not have some sort of informational value. Figure 6 shows the change in average abnormal returns and the changing behavior of stock returns.

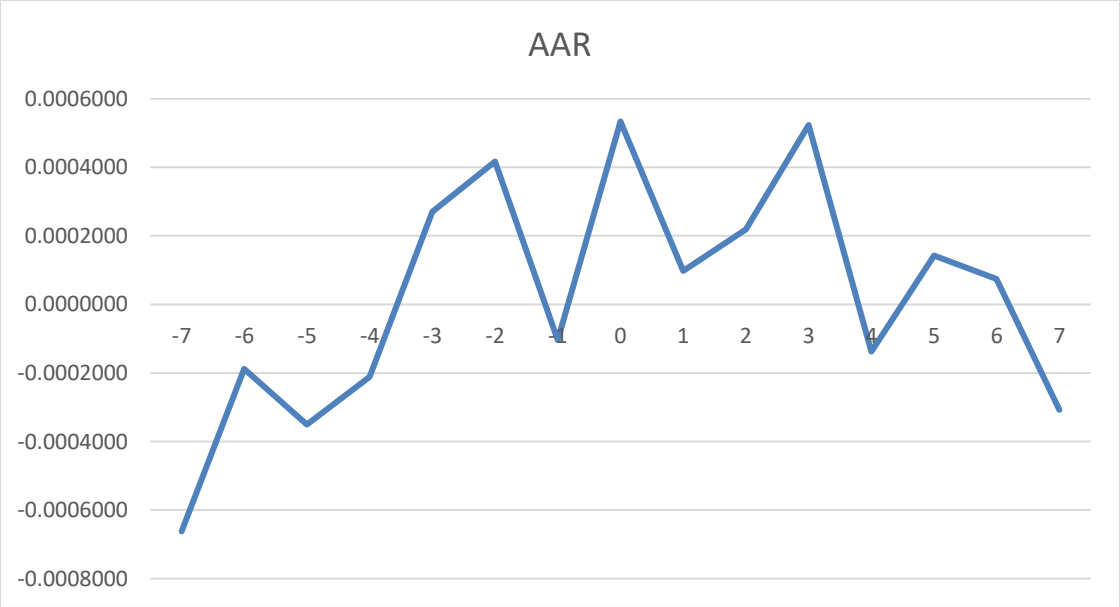


Figure 6: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following able portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks that come under religious category.

Table 7: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks that come under Religious category (n=20)

Days	AAR	t-stat AAR
-7	0.0002169	0.5415331
-6	0.0001695	0.4103746
-5	0.0008717	3.8665116***
-4	0.0003439	0.9383606
-3	0.0004219	1.2204955
-2	-0.0001276	-0.2590686
-1	0.0002313	0.5832656
0	0.0004556	1.3531833
1	-0.0002699	-0.5086730
2	-0.0003108	-0.5739719
3	-0.0006113	-0.9830357
4	-0.0002715	-0.5112376
5	0.0004462	1.3153251
6	0.0002236	0.5609506
7	-0.0000743	-0.1554367

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 7 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks that come under religious category. The above table shows positive average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, this average abnormal return (AAR) is not significant i.e. it is not away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 7 also shows that the value of t-stat is positive and insignificant on day 0 i.e. the event day. As the average abnormal returns (AAR) and t-stat values soon after the occurrence of terrorist event i.e. on 1st, 2nd, 3rd and 4th day, are negative but not significant, so it can be ascertained that there is some effect on stock returns of PSX-100 index, after the occurrence of terrorist events which are related to religion, but this effect is not significant.

This result can definitely represent that terrorist attacks have informational value. Figure 7 shows the change in average abnormal returns and the changing behavior of stock returns.

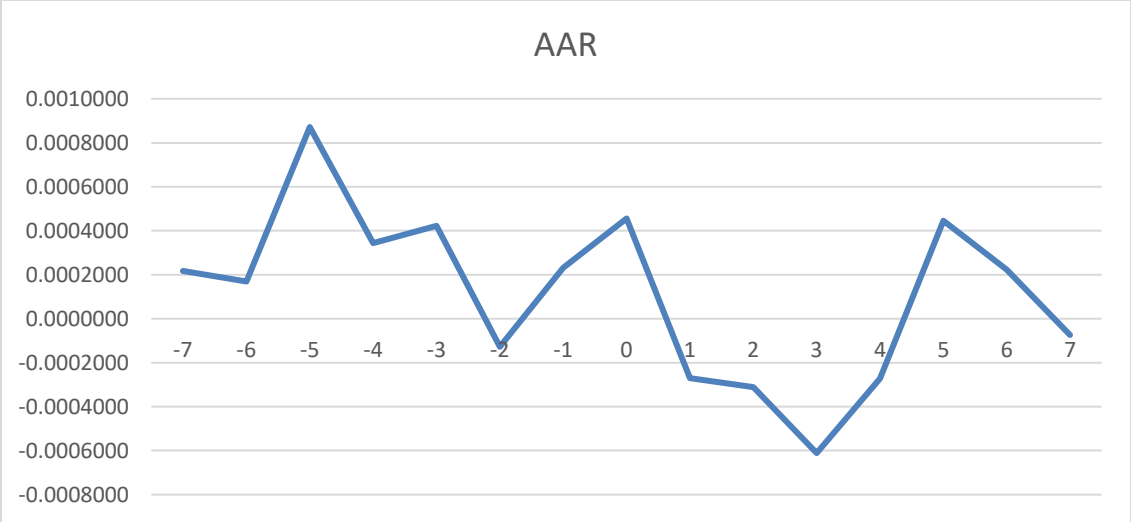


Figure 7: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

The following able portrays the particulars of average abnormal returns and t-statistics intended for 15 days' event window, from 2009 to 2016, of all sample Terrorist Attacks that come under Political category.

Table 8: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks that come under Political category (n=9)

Days	AAR	t-stat AAR
-7	-0.0001649	-0.2688802
-6	-0.0010579	-2.8236046**
-5	-0.0000255	-0.0392410
-4	-0.0003239	-0.5674324
-3	-0.0005242	-1.0132543
-2	-0.0001939	-0.3201423
-1	0.0007759	0.8972084
0	-0.0013271	-4.3838138***
1	0.0005881	0.7219345
2	0.0001167	0.1694181
3	0.0005484	0.6821038
4	-0.0001041	-0.1653309
5	-0.0006311	-1.2912167
6	0.0005676	0.7015659
7	-0.0007038	-1.4998415

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 8 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window, from 2009 to 2016, about the terrorist attacks that come under Political category. The above table shows negative average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, this average abnormal return (AAR) is significant i.e. it is away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 8 also shows that the value of t-stat is negative and significant on day 0 i.e. the event day. As the average abnormal returns (AAR) and t-stat values on the event day are negative and significant, so it can be ascertained that there is significant effect on stock returns of PSX-100 index, after the occurrence of terrorist events which are related to politics.

This result can definitely represent that terrorist attacks have informational value. Figure 8 shows the change in average abnormal returns and the changing behavior of stock returns.

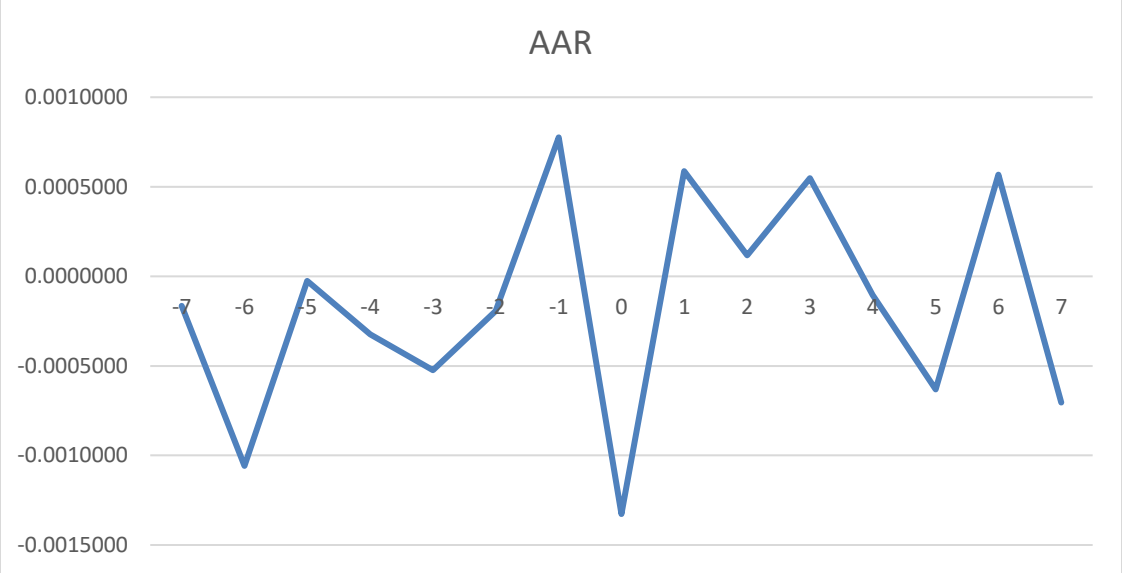


Figure 8: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

Table 9 shows the details about average abnormal returns and t-statistics for 15 days event windows of all sample Terrorist Attacks, from 2009 to 2016 that come under Security Forces category.

Table 9: Average Abnormal Returns (AAR) and t-stat of Terrorist Attacks that come under Security Forces category (n=26)

Days	AAR	t-stat AAR
-7	-0.0001210	-0.4987345
-6	0.0000506	0.1753390
-5	-0.0003063	-1.5864144
-4	0.0002457	0.7213599
-3	0.0001007	0.3334425
-2	-0.0005855	-4.9414415***
-1	0.0006413	1.4366684
0	-0.0004907	-3.4114064***
1	0.0001049	0.3463255
2	0.0000298	0.1052106
3	-0.0006065	-5.3731348***
4	-0.0001233	-0.5093775
5	-0.0002559	-1.2386845
6	0.0003318	0.9123662
7	-0.0000444	-0.1686467

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 9 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window about the terrorist attacks, from 2009 to 2016, that come under Security Forces category. The above table shows negative average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, this average abnormal return (AAR) is much significant i.e. it is much away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 9 also shows that the value of t-stat is negative and also much significant on day 0 i.e. the event day. As the average abnormal returns (AAR) and t-stat values on event day and after the occurrence of terrorist event are negative and much significant, so it can be ascertained that there is significant effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks which are related to security forces.

This result can definitely represent that terrorist attacks have informational value. Figure 9 shows the change in average abnormal returns and the changing behavior of stock returns.

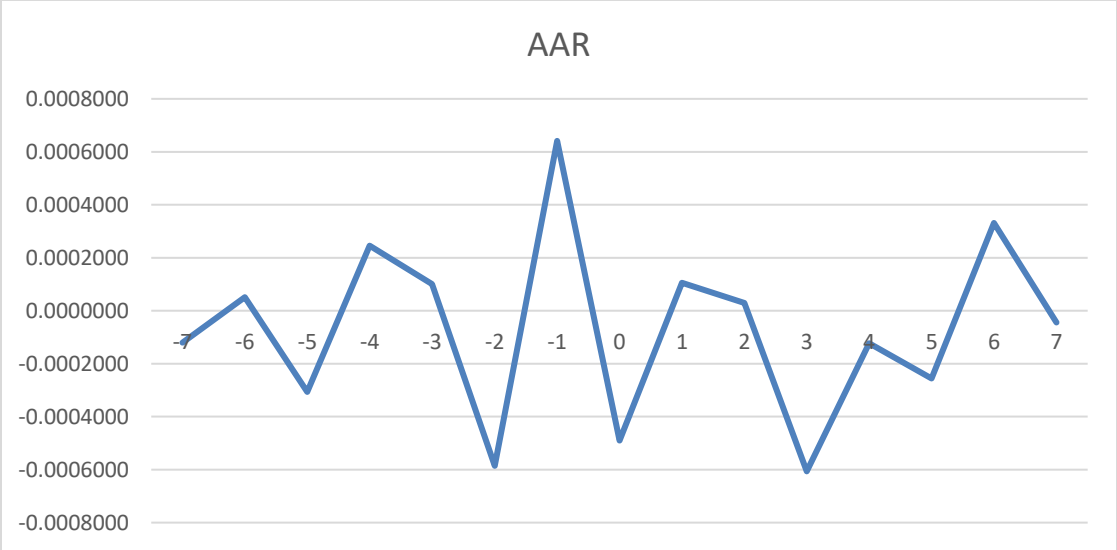


Figure 9: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

Table 10 shows the details about average abnormal returns and t-statistics for 15 days event windows of all the other sample Terrorist Attacks, from 2009 to 2016, that can't be categorized.

Table 10: Average Abnormal Returns (AAR) and t-stat of all the other sample Terrorist Attacks that can't be categorized (n=22)

Days	AAR	t-stat AAR
-7	0.0000312	0.0484661
-6	0.0001172	0.1759570
-5	-0.0000860	-0.1406143
-4	-0.0001650	-0.2794674
-3	-0.0003860	-0.7263359
-2	0.0000866	0.1316971
-1	-0.0003193	-0.5812308
0	-0.0000297	-0.0474404
1	0.0000369	0.0572239
2	0.0000307	0.0476870
3	-0.0007392	-1.7910410*
4	-0.0002714	-0.4827406
5	-0.0003439	-0.6335890
6	-0.0000022	-0.0033911
7	-0.0003345	-0.6135195

Note: ***, **, and * depicts the significance level at a confidence level of 99%, 95% and 90% respectively.

The Table 10 mentioned above contains the details of average abnormal returns (AAR) and t-statistics for 15-days event window about all the other sample Terrorist Attacks, from 2009 to 2016, that can't be categorized. The above table shows negative average abnormal returns (AAR) on day 0 i.e. the day on which terrorist event occurred, though this average abnormal return (AAR) is not significant i.e. it is not away from zero.

The above table also explains the significance of average abnormal returns (AAR) after the occurrence of terrorist attacks. The Table 10 also shows that the value of t-stat is negative but not much significant on day 0 i.e. the event day. As the average abnormal returns (AAR) and t-stat values on 3rd day after the occurrence of terrorist event are negative and also significant, so it can be ascertained that there is significant effect on stock returns of PSX-100 index, after the occurrence of terrorist attacks on PSX-100 index returns.

This result can definitely represent that terrorist attacks have informational value. Figure 10 shows the change in average abnormal returns and the changing behavior of stock returns.

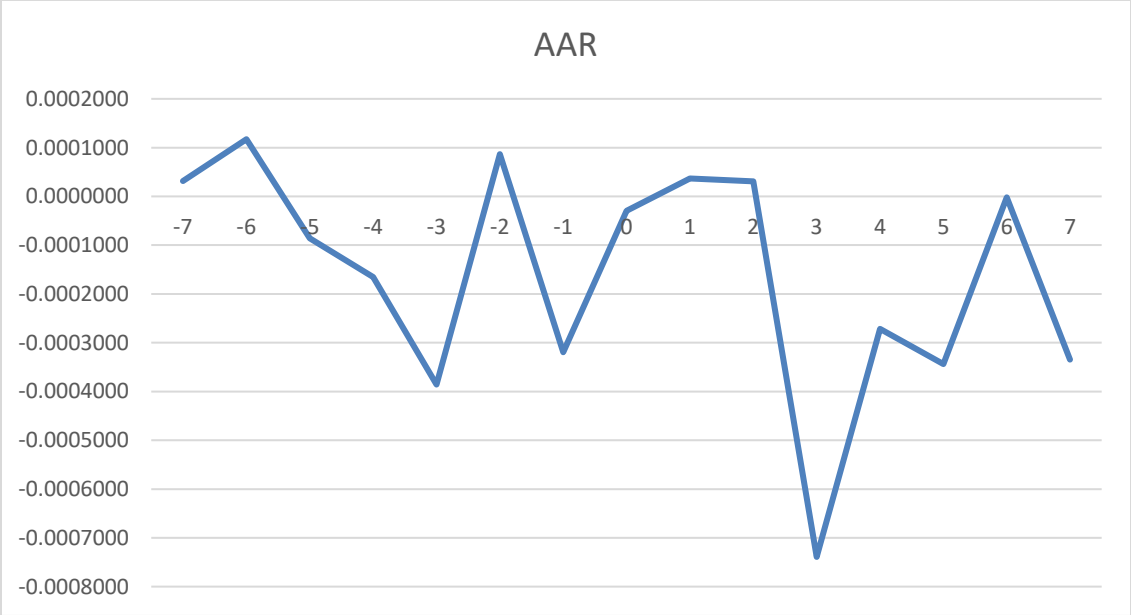


Figure 10: depicts the values of average abnormal returns on perpendicular axis and number of days on parallel axis.

4.2 TREND ANALYSIS

The purpose of running trend analysis is to check the relationship between time (years from 2009 to 2016) and the impact (abnormal returns) of terrorist attacks over

stock returns of stock market of Pakistan. The above results show that terrorist attacks have an impact (either significant or not) on stock returns of the stock market of Pakistan, but in order to know, either this impact increases or decreases with the passage of time, following trend analysis has been conducted.

The following Figure 11 explains the trend of terrorist attacks, related to Religion, from 2009 to 2016.

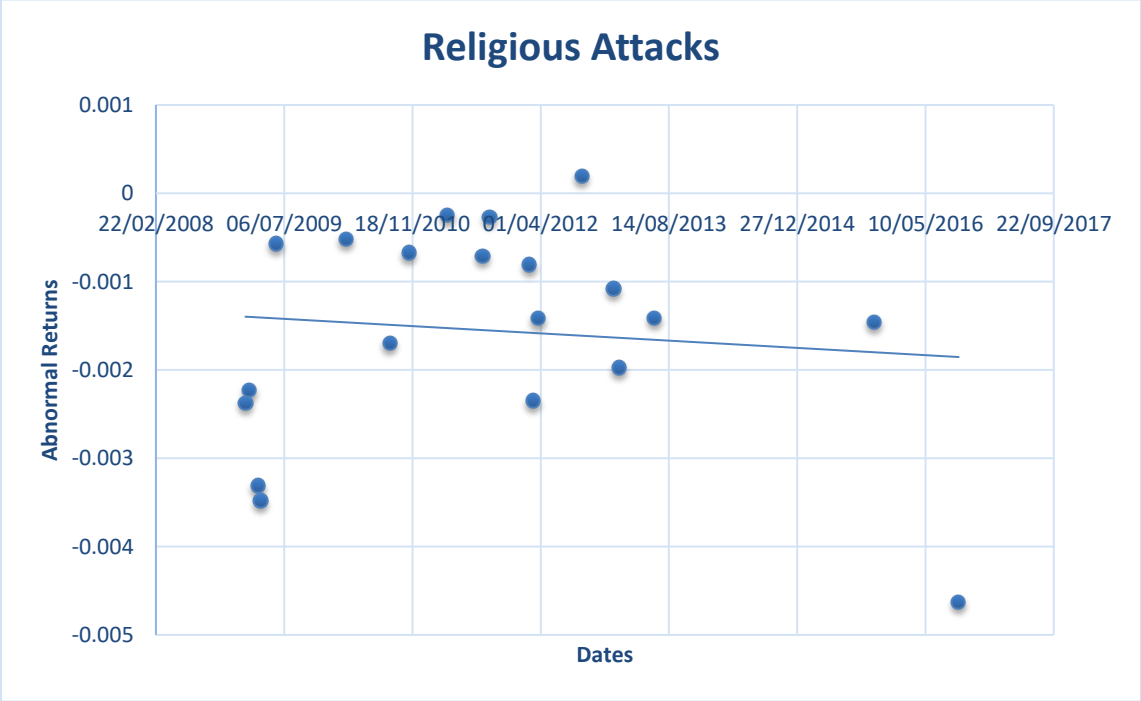


Figure 11: depicts the values of average abnormal returns on perpendicular axis and years on parallel axis.

In the above Figure 11, time period is taken on horizontal axis while abnormal returns on vertical axis. In this graph, the trend line shows that there is not any relationship (of terrorist attacks targeted on religious agendas) between time and impact of terrorist attacks i.e. the relationship is neither positive, nor negative. This explains that terrorist attacks might have some impact over stock returns of stock market of Pakistan, but time does not affect this impact of terrorist attacks; which

means, over time, this impact of religious attacks on stock returns is not increasing or decreasing in the time period from 2009 to 2016.

The following Figure 12 explains the trend of terrorist attacks, related to Politics, from 2009 to 2016.

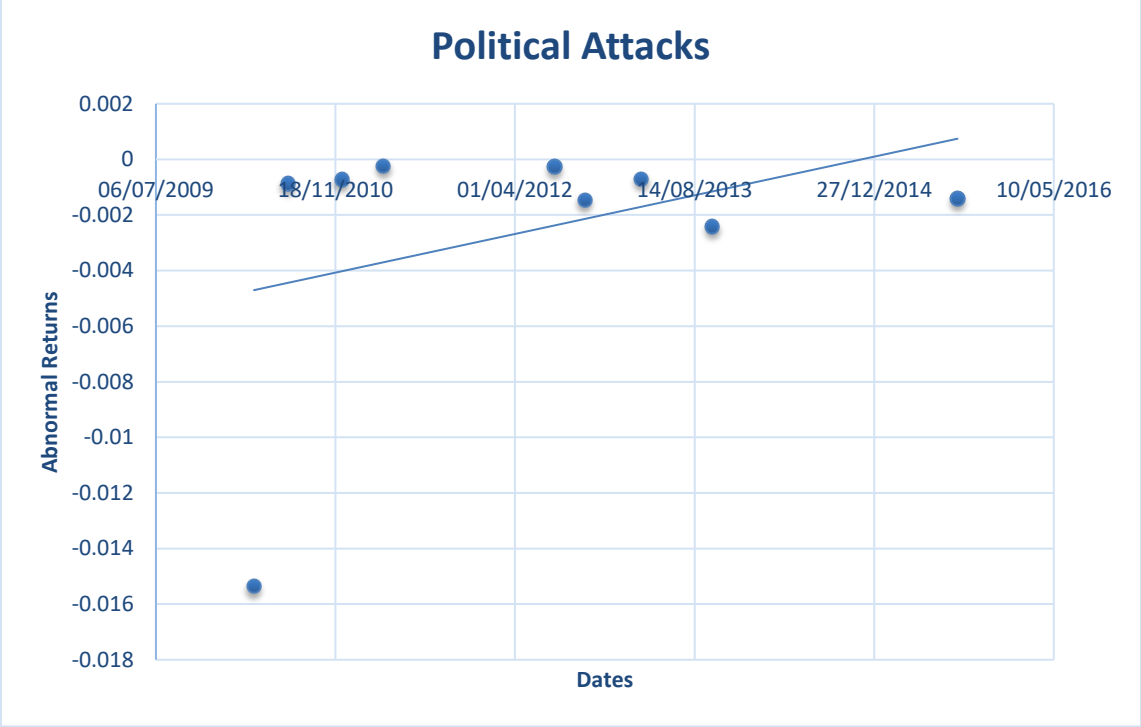


Figure 12: depicts the values of average abnormal returns on perpendicular axis and years on parallel axis.

In the above graph, time period is placed on horizontal axis while abnormal returns on vertical axis. In this graph, it is clear that the relationship between time and impact of terrorist attacks targeted on political agendas is positive. But if we omit the first terrorist attack (which was occurred in 05-04-2010) then there is not any relationship between time and political attacks. This attack, which was occurred in 05-04-2010, might have significant impact because the number of causalities in this attack were 45 and the number of people injured were more than 100. Because of more causalities and injuries, this attack could have created panic in the public, and due to

this panic in the public, this event could have affected the relationship between time and political terrorist attacks. In short, political terrorist attacks might have some impact over stock returns of stock market of Pakistan, but this impact does not increase or decrease over time in the time period from 2009 to 2016.

The following Figure 13 explains the trend of terrorist attacks, related to Security Forces, from 2009 to 2016.

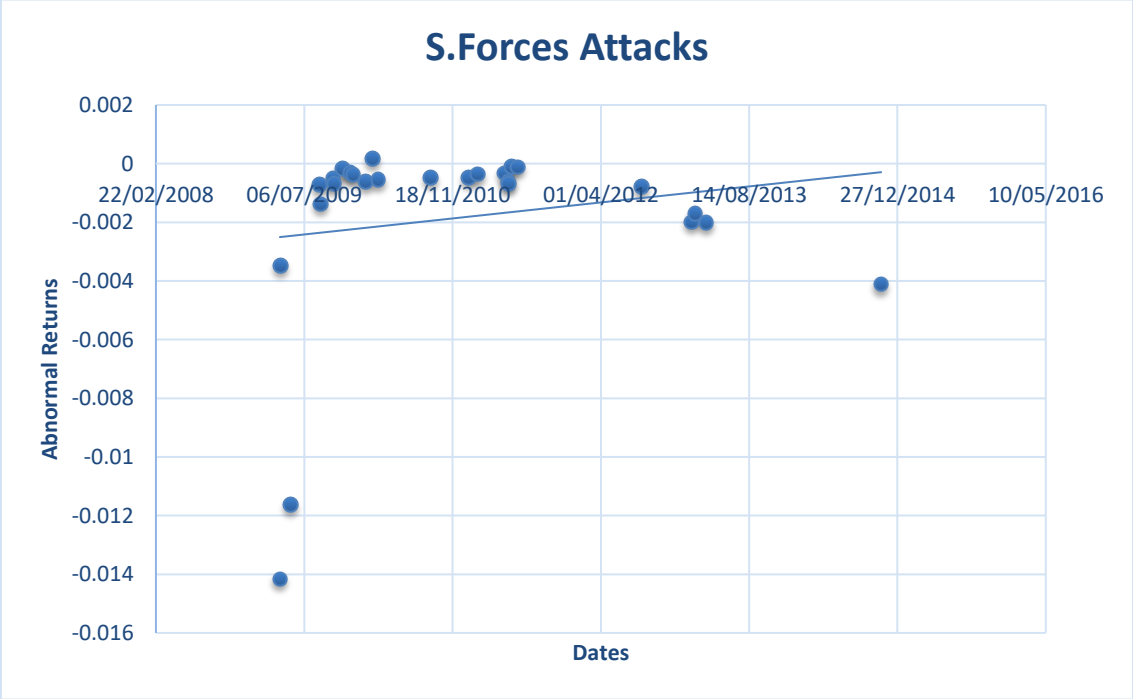


Figure 13: depicts the values of average abnormal returns on perpendicular axis and years on parallel axis.

The above graph shows time period on horizontal axis while abnormal returns on vertical axis. The trend line in this graph explains that there is not any relationship among time and the terrorist attacks targeted on security forces i.e. the relationship among time and impact is neither positive, nor negative. This means that terrorist attacks might have some impact over stock returns of the stock market of Pakistan, but time does not affect this impact; which means that the impact of terrorist attacks

(targeted on security forces) on stock returns of PSX-100 returns, does not increase or decrease over time in the time period from 2009 to 2016.

In the above trend analysis, time period (i.e. years from 2009 to 2016) is taken on horizontal axis while the impact (i.e. abnormal returns of the terrorist attacks) is placed on the vertical axis. After looking at the graphs, it is clear that the trend line is almost flat or near to flat, which explains that the impact of terrorist attacks does not increase or decrease with the passage of time. This concludes that the impact of terrorist attacks on stock returns is not increasing or decreasing over time because the trend line (which shows the relationship among time and impact of terrorist attacks on stock returns) is neither positively sloped nor negatively sloped, in almost each scenario. This analysis provide the fact that terrorist attacks might have some impact on the stock returns of stock market of Pakistan, but this impact does not increase or decrease over time, in the time period from 2009 to 2016.

CHAPTER V

CONCLUSION

In the course of recent decades, terrorism has turned into a worldwide wonder, and almost all the societies are practically facing the problem of terrorism. The associations involved in the course of terrorism work under the shared rules which could be known as terrorist plan or strategy. Terrorist sensation has influenced the lives of thousands of people across the globe so it caught the consideration of many investigators and scholars, to conduct researches to establish different theories, so that the sensation of terrorism, which has extended its scope from the last few years, could be crumbled with the help of these theories.

Terrorism in Pakistan has turned into the most dangerous sensation affecting not only a number of fatalities and injuries but also financial cost to the economy. Terrorist events in Pakistan have demonstrated a striking surge since 2000. Terrorist activities in Pakistan generates vulnerability by expanding the threat to put investments and resources in the country, this unfavorably influences securities exchanges and can prompt to bring down the financial development, more cost to the organizations, and adverse effects to the general public of Pakistan. As indicated by government insights, the monetary cost of terrorism which Pakistan has borne in most recent ten years is $68 billion.

This study is aimed to ascertain the impact of terrorist events on the stock market of Pakistan, the data taken to see the impact is daily time series data from year 2009 to 2016. Pakistan is facing a major number of terrorist attacks in almost every corner of the country, which adds its name in the top of those countries, which are facing huge number of terrorist cases on yearly basis. As indicated by the fractional information incorporated by the South Asia Terrorism Portal (SATP) database, 831 fatalities have happened due to terrorist events in Pakistan in 2016, consisting of 222

civilian people, 102 “Security Force” work force and 507 terrorists/rebels. The nation has additionally documented 82 main occasions (each including at least three fatalities) bringing about 715 fatalities (183 civilian citizens, 68 SF work force and 464 rebels/terrorists). Other than this, there are 43 attacks representing 176 fatalities and more than 520 injuries in the present year.

Fatalities due to terrorist attacks have managed a declining pattern in Pakistan since the apex of 2009 when total number of fatalities summed a stunning 11,704 (2,324 civilian citizens, 991 SF staff and 8,389 terrorists). 2014 saw a transient distortion in the pattern, with 5,496 fatalities, a minimal increment, on year premise, from 5,379 fatalities documented in 2013. Each of the four Provinces of Pakistan i.e. Baluchistan, KP, Punjab, and Sindh; alongside the Federally Administered Tribal Areas (FATA) and Pakistan administered Kashmir (PaK) noted drops.

By using the event study methodology, we found that terrorist attacks have adverse effect on the performance of Pakistan stock market. The results shows that average abnormal returns are negative but insignificant on the event day. Our results are in line with the prior studies of (Nguyen et al., 2009, Aslam et al., 2014 & Hassan et al., 2014). The results of the study also show that average abnormal returns are negative and highly significant mostly two days after the occurrence of terrorist event, which is 3rd day after the occurrence of terrorist event, which means terrorist events have an adverse impact over the stock returns of PSX. This trend explains that stock market takes time to incorporate the informational value of these terrorist attacks. As stock market takes time to incorporate changes after the occurrence of terrorist attacks, so it can be assumed that Pakistan Stock Exchange tends to fall somewhere between weak and semi-strong form of efficient market as explained by Fama & French (1970).

In our study, the sector-wise analysis also explain that major cities (i.e. Rawalpindi, Lahore, Peshawar, etc.) have more negative and significant impact over the stock returns of PSX-100 index due to the occurrence of terrorist events as compared to minor cities (i.e. Quetta). On the other hand, results also depict that the terrorist attacks

on security forces (SF) have more negative and significant impact on the stock returns as compared to the terrorist attacks targeting religious or political activities. However, all the terrorist attacks (no matter the category of the terrorist attacks) somehow have a negative and significant impact over the stock returns of PSX-100 index.

In our study, the trend analysis is also conducted to examine the relationship between time and impact of terrorist attacks over stock returns of Pakistan. The trend analysis shows a flat trend line (i.e. neither positively sloped nor negatively sloped), which means that time and impact (of terrorist attacks over stock returns) do not have any relationship among them. So, we can conclude that terrorist attacks can adversely affect the stock returns of stock market of Pakistan, but this impact does not increase or decrease with the passage of time.

The interesting thing is that, sometimes stock market also responds before the occurrence of terrorist events due to false news and warnings about the happening of terrorist attack. That's why, in some of the cases, terrorist attacks have negative and significant impact over stock returns of PSX-100 index, one day before the occurrence of terrorist attack. Our overall results, as well as, sector wise analysis of the results also show the same thing. Similarly, the extreme attack in which number of fatalities is more, has a more negatively significant impact on stock returns of PSX-100 index.

If we talk about the limitation of our review, the only financial market that we have taken in our study is the stock market of Pakistan i.e. PSX-100 index. The contrast with various financial markets, similar to a bond market or outside trade markets of various nations, can be the subject for future research. We likewise overlooked different nations for contrast, as each nation has distinctive sizes of the market, security concerns, political frameworks, and structure of monetary foundations, so examination between various nations and areas has not been done; so we left this gap for future research.

Our exploration can create administrative and policy suggestions for creation of portfolios, security exchanges, national security, and strategy making. By keeping in perspectives the strategies of “terrorism have impact over stock returns”, investors can deal with their portfolio, as the effect of the terrorist events changes with the area, sorts of attack, and number of fatalities. As we noticed that impact of the attack does not last more than 2 or 3 days after the occurrence of terrorist attack so this could also help investors in dealing with the holding period of their money (investment).

The returns of PSX are significantly affected by the terrorist attacks, so this study could help in enhancing the anti-terrorism strategies, to overcome the challenges due to terrorist events. As the trend of globalization is common in these days, notwithstanding the reaction of the establishments, the collaboration amongst central banks & other financial organizations, regulators and intelligence related institutions, it is necessary to make the stock market stronger in contrast to terrorism. In particular, all the significant stakeholders are urgently required to take serious steps against terrorism, which could help those countries (that are facing terrorism) in creating a good picture of themselves. Research, in future, can enhance the suggestions to examine the pitiable strategies of establishments in the light of shifted terrorist strategies from the points of view of financial markets. Future reviews could likewise investigate behavioral and psychology related procedures that an individual experience amid such extraordinary and hyper conditions.

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