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CONVENTIONAL AND ISLAMIC EQUITY MARKET REACTION TOWARDS TERRORISM: EVIDENCE BASED ON TARGET TYPES, LOCATION AND ISLAMIC CALENDAR MONTHS

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Abstract: This study investigates the conventional and Islamic equity market reaction towards terrorism events in Pakistan from 2009 to 2016 using OLS regression and GARCH (1, 1) models. The prospect theory and efficient market hypothesis are the relevant theories. Findings indicate that conventional and Islamic equity market reaction towards terrorism events is very short lived and markets recovers quickly. This study also documents the market reaction to terrorism events based on the target type, location and during the Islamic calendar months. The impact of different target types and different event locations on the conventional and Islamic equity markets varies. The equity markets in Pakistan responds negatively to the attacks on educational institutes and businesses whereas positively to attacks on armed forces' facilities. Furthermore, conventional equity market responds negatively to terrorist attacks in Karachi and positively to attacks in financial cities and FATA. Interestingly, Islamic equity market responds positively towards the attacks in financial cities and FATA, however, with very minute reaction magnitude. The findings of this study are useful for the

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investors to manage their portfolios by considering magnitude and direction of market reaction towards terrorism based on the target type, location and Islamic months. Overall, this study concludes that conventional and Islamic equity markets reaction towards terrorism is very minute; however, the conventional and Islamic equity markets reaction varies based on target type, event location and different Islamic calendar months. Furthermore, the findings also suggest that equity markets recover very soon, therefore, markets are efficient in observing these shocks.

Keywords: terrorism; efficient market hypothesis; prospect theory; Pakistan.

JEL codes: E44, G14, H56.

1. Introduction

Pakistan is one of the countries which have been facing terrorism issue since the 9/11 US attacks. Furthermore, Pakistan has borne a huge direct and indirect amount as cost of terrorism which may be near 103 billon US$ which is equivalent to PKR 8,260 billion (Khan set al., 2015). Sometimes negative events create high negative volatility which coerce the looser investor to quit the market (Ali & Afzal, 2012). Terrorism may also negatively affect the equity returns causing the slowdowns in the equity market. For instance, Chen and Siems (2004) studied on the effects of terrorism on global equity markets and found that the terrorist attack does affects the global equity markets. Recent studies also reported similar results (Kong et al., 2021; Ahmad et al., 2022; Arfaoui & Naoui, 2022; Narayan et al., 2022). In addition, Arin et al. (2008) also stated that terrorism affects financial markets and their results demonstrated that terror has significant impact on both equity market returns and equity market volatility. Similarly, Eldor and Melnick (2004) also explained that any distress in market in relation to terrorism have an impact on the pricing of financial markets.

Given the relationship of terrorism with equity returns, later studies found significant differences based on characteristics of companies, target type, location of events and date of events. For instance, Nedelescu and Johnston (2005) detailed some variances in the financial market response to different terrorist attacks. For instance, they documented that 9/11 events had more severe effect on equity returns as compared to Madrid. Therefore, their results emphasized that terrorist attack reaction on financial market was perceived differently based on the place of attack. Similarly, Aslam and Kang (2013) also reported that terrorism events in Pakistan has different effect in different locations. However, prior research unheeded the Islamic equity market reaction towards terrorism based on different target types and locations.

Likewise, there is no evidence on what happens to investor moods if any negative event occurs during different Islamic calendar months. There is a need to investigate,

whether any event of terrorism happened in the different Islamic months would have different impacts on investor moods and equity returns? Despite of the fact that most of the studies agree with the Ramadan effect in stating that during this month, investor behaviour is optimistic due to better mood. In contrast evidence shows that the magnitude of Ramadan effect diminished during global financial crises (Al-Khazali, 2014). It implies that the investor optimism during Ramadan might be reduced if any negative event happened during this month. Chung et al. (2012) stated that the return predictability of sentiment should be most pronounced when investors' optimism increases. According to Białkowski et al. (2012) Ramadan positively affects the investors moods thereby positively influence the equity returns.

Similarly, other Islamic month that contains sadness in moods like Muharram [1] may increase the investor pessimist behaviour if any negative event of terrorism happens. Al-Ississ (2010) reported the sadness in investor moods during Muharram. Moreover, riskiness is attached with the investor mood which comes from different sources. Similarly, other studies has supported this argument, that, in certain Islamic months, investors behaviour is different as compared to the other months (Białkowski et al., 2012; Ramezani et al., 2013; Al-Khazali, 2014; Halari et al., 2015). For instance, Ramezani et al. (2013) stated that stock returns are positively related to Ramadan, Shawwal and Rabi months whereas, negatively related to the Jumada II, Rabi al-awwal, Muharram and Rajab months. It indicates that investors moods are vary in different Islamic months.

Many studies has reported the relationship between certain events with the investor mood like sports (Edmans et al., 2007), temperature (Cao & Wei, 2005) and daylight (Kamstra et al., 2003). Bogan and Fertig (2013) reported that mental health is negatively related to the risky portfolio choice. Therefore, this study intends to investigate the impact of terrorist events on conventional and Islamic equity returns. Similarly, this study also investigated the impact of terrorism events on conventional and Islamic equity returns based on target type and location. Furthermore, the interaction effect of terrorism events with Islamic calendar months on the conventional and Islamic equity market returns is also examined. The organization of the study is as follows: Section 1 covers the introduction of the study. Section 2 sets forth the literature review. Research methodology is described in Section 3. Section 4 presents the data analysis and empirical findings; Section 5 provides the conclusion of the thesis.

2. Literature Review

Past researches have examined the impact of different economic and non-economic events on equity market returns (Balteș & Pavel, 2019; Vrînceanu et al., 2020; Dumiter & Turcaș, 2022). Likewise, many of the previous studies has reported

negative effects of terrorism on equity returns in developed countries (Arin et al., 2008; Drakos, 2010; Chesney et al., 2011; Graham & Ramiah, 2012; Kumar & Liu, 2013; Essaddam & Mnasri, 2015). Similarly, there are other studies reporting negative impact of terrorism events on equity market returns in developing countries (Aslam & Kang, 2013; Ramiah & Graham, 2013; Aslam et al., 2015; Kutan & Yaya, 2016; Tavor, 2016; Irshad et al., 2019). On the other side, some of the previous studies has reported that markets are efficient and adjust quickly after any terrorism event (Chen & Siems, 2004; Eldor & Melnick, 2004; Barry Johnston & Nedelescu, 2006; Peleg et al., 2011; Christofis et al., 2013). Aforementioned evidence was reported by studies conducted on developed countries as well as on developing countries (Liashuk & Vychavka, 2020; Gambarov, 2018; Hersekova Bojmirova, 2022). For instance, Chen and Siems (2004) reported that equity market in US are efficient and recover quickly after terrorist attacks. Similarly, Peleg et al. (2011) reported that Israeli equity market absorbs the effects of terrorism and market adjust quickly. In addition, Eldor and Melnick (2004) also reported that Israeli equity markets were not affected by terrorism events and market continue their operations efficiently.

There is also empirical evidence on the efficiency of emerging and developing equity markets. According Christofis et al. (2013) Istanbul Stock Exchange recovered quickly after the terrorist attacks. Similarly, some other studies have also reported that terrorism events do not affect the efficiency of equity markets (Bora Ramiah, 2012; Hassan & Hashmi, 2015; Holwerda & Scholtens, 2016). Barry Johnston and Nedelescu (2006) studied the impact of terrorist events on global equity markets and reported that financial markets were efficient. All these studies showed mixed evidence on the impact of terrorism events on equity returns. Past studies indicate differential impact of terrorism across developed and developing equity market (Irshad & Mohd Taib, 2017). However, most of previous studies have examined the impact of terrorism events on the conventional stock market returns whereas this study also intended to examine the impact of terrorism events on the Islamic index. Therefore, to examine the semi strong form of efficiency in the equity markets of Pakistan, following hypotheses are developed;

H1 = Terrorist attack events in Pakistan affect the conventional equity market returns in Pakistan.
H2 = Terrorist attack events in Pakistan affect the Islamic equity market returns in Pakistan.

Most of the previous studies has examined the direct impact of terrorism on equity prices (Chen & Siems, 2004; Brounen & Derwall, 2010; Karolyi & Martell, 2010;

Apergis & Apergis, 2016) and only few looked into the impact of terrorism on equity returns based on the type of an event (Eldor & Melnick, 2004; Aslam & Kang, 2013; Aslam et al., 2015). Among these few studies, Aslam and Kang (2013) reported that attacks on mosque have significant effects on equity returns. Furthermore, they stated that Mosque being place of worship entails spiritual and emotional affiliations by Muslims. Thus, any attack on mosque may show severe decline in equity market prices. This fact shows that different types of terrorist attacks may have different impacts on equity returns.

Moreover, Aslam and Kang (2013) stated that mosque attacks, suicide attacks, and attacks on foreigners residing in Pakistan have a negative impact; although this is not significant. Recently, Aslam et al. (2015) found that suicide and bomb/explosion attacks are particularly devastating to the Asian stock markets. Similarly, Eldor and Melnick (2004) found that equity markets are affected by the terrorism based on different types of attacks whereas, equity markets are not affected by terrorism based on location of an attack. Their results demonstrated that suicide attack have lasting effect on equity market returns. Likewise, equity market is affected by the terrorism events based on the target type such as attacks on armed forces, business, government and private citizens (Aslam et al., 2015). These arguments show that effect of terrorism event may vary based on the type of event. In line with the previous hypotheses, this study also examined the impact of terrorism events on Islamic equity market returns based on the target type of terrorist attack. Therefore, to examine the semi strong form of efficiency in the equity markets of Pakistan based on target type of attack, the following hypotheses are developed;

H3 = Effect of terrorist attacks on conventional equity returns in Pakistan varies based on the target type.

H4 = Effect of terrorist attacks on Islamic equity returns in Pakistan varies based on the target type.

Terrorism events happening in those cities where equity markets are situated significantly affect the equity returns. (Aslam & Kang, 2013). However, Eldor and Melnick (2004) reported that terrorism events based on the location of events have no significant impact on the equity markets and post event recovery time is rapid. Any event of terrorism in financial and big cities may affect the equity returns more severely as compared to the other cities. Terrorism events in financial and big cities may create fear among investors and may create a perception that other parts of the country may also be targeted. Moreover, most of the multinationals and banks are headquartered at these cities. Hence, this study intends to examine the impact of terrorism on equity returns based on the location of event in the conventional and

Islamic equity market returns. Therefore, to examine the semi strong form of efficiency in the equity market of Pakistan based on location of an attack, the following hypothesis is developed:

H5 = Effect of terrorist attacks on conventional equity returns in Pakistan varies based on the location of terrorist attack.
H6 = Effect of terrorist attacks on Islamic equity returns in Pakistan varies based on the location of terrorist attack.

Previous studies have documented that presence of abnormal returns during certain calendar dates. These abnormalities are known as anomalies to the efficient market hypothesis, for example January anomaly (Kohers & Kohli, 1991; Gamble, 1993; Lucey & Zhao, 2008), Monday effect (Cho et al., 2007), seasonal variation (Abbas et al., 2021) and, weekend effect (Connolly, 1989; Brooks & Kim, 1997). However, these anomalies are based only on the Gregorian calendar. Recent research has identified other anomalies in the equity returns based on the Islamic calendar months like Ramadan effect in various Islamic countries (Białkowski et al., 2012; Ramezani et al., 2013; Al-Khazali, 2014) and also other Islamic months based anomalies (Al-Ississ, 2010; Halari et al., 2015).
These anomalies are based on the assumption that investor moods are different in different months consequently affecting the equity returns. Based on the same premise, many of the other studies stated that terrorism events may also affect the investors sentiment thereby affecting the equity returns (Drakos, 2009, 2010). However, none of the study up to best of author's knowledge has examined the impact of terrorism events on equity returns based on Islamic calendar dates. For instance, impact of terrorism events may increase, decrease or neutralizes during certain Islamic month. Previous research postulates that Ramadan positively affects investor moods whereas terrorism events negatively affect investor moods. However, there is need to examine whether negative effects of terrorism on equity returns varies during different Islamic months. Furthermore, the impact of terrorism during different Islamic months is examined on conventional and Islamic equity returns. Therefore, to examine the semi strong form of efficiency in the equity market of Pakistan based on Islamic calendar months, the following hypothesis is developed:

H7 = Effect of terrorist attacks on conventional equity returns in Pakistan varies in different Islamic months.
H8 = Effect of terrorist attacks on Islamic equity returns in Pakistan varies in different Islamic months.

3. Research Methodology

3.1. Event Selection

This study has examined the equity market reaction towards terrorism events. Regarding the event selection, terrorism events were selected based on severity of events due to large number of terrorism events happened during the sample period. However, this study has adopted the criteria that only those terrorism events were taken which involves at least 3 human killings following Lyngsø Jørgensen and Breum Nielsen (2017). Based on this criterion, the number of events becomes 1206. Likewise, three more samples were tested which involves at least 7, 10 and 20 human killings. The number of events for these three events becomes 438, 285 and 109 respectively.

Furthermore, this study has considered all those events as one event which occurred on the same day. Accordingly, dummies were assigned to all the locations affected by the event. Although, this study has used four samples for the analysis, however, only results for sample 1 are reported and discussed in the paper. Results for samples 2, 3, and 4 are not discussed in the paper because the model fits were weak. Following table provides the sample of events used in this study for analyzing the impact of terrorism on the conventional and Islamic equity market returns.

Table 1 Samples used for Terrorism Events.

Sr. No.	Sample Description	Criteria	No. of Events
1	Terrorism Events	All events with at least 20 killings	109
2	Terrorism Events	All events with at least 10 killings	285
3	Terrorism Events	All events with at least 07 killings	438
4	Terrorism Events	All events with at least 03 killings	1206

Source: Author's Own Processing.

3.2. Event Day Analysis

The impact of terrorism events on the conventional and Islamic equity market returns are measured by ordinary least square regression and GARCH (1,1). Following Tables describes the measurement of variables to examine the impact of terrorism events on conventional and Islamic equity market returns:

Table 2 Variable Description

Sr. No.	Variable	Notation	Description
1	Lagged returns	Ret_{t-1}	One period lagged returns
2	Three days Pre-Event	Neg_{t-3}	Dummy variable used to estimate the day which is three days before the event

3	Two days Pre-Event	Neg_{t-2}	Dummy variable used to estimate the day which is two days before the event
4	One day Pre-Event	Neg_{t-1}	Dummy variable used to estimate the day which is one days before the event
5	Event Day	$Eventday_t$	Dummy variable used to estimate event day
6	Post Event Day One	Pos_{t+1}	Dummy variable used to estimate the day which is one days after the event
7	Post Event Day Two	Pos_{t+2}	Dummy variable used to estimate the day which is two days after the event
8	Post Event Day Three	Pos_{t+3}	Dummy variable used to estimate the day which is three days before the event

Source: Author's Own processing.

Table 2 describes the variables used in this study to examine the direct impact of terrorism events on conventional and Islamic equity market returns. For this purpose, the dummies were assigned to the days before the event, event day and days after the event. This methodology has been adopted following many of the previous studies where impact of terrorism events has been analyzed by using the dummies (Hon et al., 2004; Nikkinen & Vähämaa, 2010; Aslam & Kang, 2013; Aslam et al., 2015; Apergis & Apergis, 2017). Past studies in this area using dummy variables approach have examined the market reaction by taking different pre and post event dummies such as one day pre and post event dummies (Aslam & Kang, 2013; Tavor, 2016; Chaudhry et al., 2018; Javaid & Kousar, 2018), two days pre and post event dummies (Nikkinen & Vähämaa, 2010; Aslam et al., 2015) and three days pre and post dummies. Since, the frequency of terrorism events in Pakistan is very high, therefore, following these studies, this study also used short term window by taking pre and post event dummies. However, this study has used three days pre and post event dummy to have more market reaction up to three days after the event. Likewise, following previous studies this study has used pre-event dummies to control the pre-event effect (Aslam & Kang, 2013; Aslam et al., 2015; Hassan & Hashmi, 2015; Tavor, 2016). Furthermore, to control for autocorrelation, one period lagged dependent variable can has been used as a control in the equation in previous studies (Eldor & Melnick, 2004; Li & Schaub, 2004; Guo & Kliesen, 2005; Kutan & Yaya, 2016; Narayan et al., 2018). Hence, following prior studies, this study also used one period lagged equity returns as a control variable to avoid autocorrelation.
To measure the impact of terrorism events on the conventional equity market returns, the following equation is used:

$$Ret_{KSE} = \beta_1 Ret_{t-1} + \beta_2 Neg_{t-3} + \beta_3 Neg_{t-2} + \beta_4 Neg_{t-1} + \beta_5 Eventday_t + \beta_6 Pos_{t+1} + \beta_7 Pos_{t+2} + \beta_8 Pos_{t+3} + \epsilon \quad (1)$$

And, following equation represents the impact of terrorism events on the Islamic equity market returns:

$$Ret_{KMI} = \beta_1 Ret_{t-1} + \beta_2 Neg_{t-3} + \beta_3 Neg_{t-2} + \beta_4 Neg_{t-1} + \beta_5 Eventday_t + \beta_6 Pos_{t+1} + \beta_7 Pos_{t+2} + \beta_8 Pos_{t+3} + \epsilon \quad (2)$$

Where;
$Ret._{KSE}$= return of conventional equity market measured as natural logarithm of closing price of KSE 100 index on day t divided by closing price at day t_{-1}
$Ret._{KMI}$= return of Islamic equity market measured as natural logarithm of closing price of KMI 30 index on day t divided by closing price at day t_{-1}
Ret_{t-1} = indicates one period lagged returns
Neg_{t-3} = measured as 1 if 3 days before the event, zero otherwise
Neg_{t-2} = measured as 1 if 2 days before the event, zero otherwise
Neg_{t-1} = measured as 1 if 1 days before the event, zero otherwise
$Eventday_t$= measured as 1 if event day, zero otherwise
Pos_{t+1} = measured as 1 if 1 day after the event, zero otherwise
Pos_{t+2} = measured as 1 if 2 days after the event, zero otherwise
Pos_{t+3} = measured as 1 if 3 days after the event, zero otherwise
ε = error term

3.3. Terrorism Target Types

This section provides the details on analysis used for conventional and Islamic equity market reaction to the terrorism events on the basis of different target types.Since, the data has been obtained from the Global Terrorism Database, therefore, target types have been taken from the categories given on Global Terrorism Database following previous research studies (Eldor & Melnick, 2004; Berrebi & Ostwald, 2013; Aslam et al., 2015). In regard to terrorism, this study has divided the targets types into seven different types which are presented in the Table 3. These seven target types include attacks on armed forces, business, educational institutes, governments, private citizens, religious figures and all other attacks. Furthermore, target types were analysed using dummy variables. Every target type of attack was assigned a dummy for instance, dummy variable takes the value of 1 if target type is armed forces, zero otherwise. All other six types of attacks were assigned dummies accordingly.
Following Table describes the target types of terrorism events:

Table 3 Terrorism Events based on Target Type

Sr. No.	Terrorism Target Type	Notation	Description
1	Armed Forces	AF	Attacks on armed forces
2	Business	BUS	Attacks on business
3	Educational Institutions	EI	Attacks on Educational Institutions
4	Government	GOV	Attacks on government offices/departments
5	Private Citizens	PC	Attacks on private citizens
6	Religious Figures	RF	Attacks on religious figures
7	Other Attacks	OA	Other attacks

Source: Author's Own Processing.

Following equations are developed to test the impact of terrorism events on equity returns in Pakistan based on target types.

$$Ret_{KSE} = \beta_1 Ret_{t-1} + \beta_2 AF + \beta_3 BUS + \beta_4 EI + \beta_5 GOV + \beta_6 PC + \beta_7 RF + \beta_8 OA + \epsilon \quad (3)$$

And, following equation describes the impact of terrorism events on Islamic equity market returns.

$$Ret_{KMI} = \beta_1 Ret_{t-1} + \beta_2 AF + \beta_3 BUS + \beta_4 EI + \beta_5 GOV + \beta_6 PC + \beta_7 RF + \beta_8 OA + \epsilon \quad (4)$$

where;
$Ret._{KSE}$= return of conventional equity market measured as natural logarithm of closing price of KSE 100 index on day t divided by closing price at day t_{-1}
$Ret._{KMI}$= return of Islamic equity market measured as natural logarithm of closing price of KMI 30 index on day t divided by closing price at day t_{-1}
Ret_{t-1} = indicates the lagged returns
AF = Attacks on armed forces measured as 1 if attack on armed forces, zero otherwise
BUS = 1 if attacks on business places, zero otherwise
EI = 1 if attacks on educational institutions, zero otherwise
GOV = 1 if attacks on government offices/departments, zero otherwise
PC = 1 if attacks on private citizens, zero otherwise
RF = 1 if attacks on religious figures, zero otherwise
OA = 1 for all other attacks except mentioned above, zero otherwise

ε = error term

3.4. Location of Event

This study has also examined the equity market reaction towards terrorism events based on the event location following the past studies by considering the importance of location (Eldor & Melnick, 2004; Noy & Vu, 2010; Aslam & Kang, 2013; Aslam et al., 2015). There were five location categories taken by some of the past studies such as Karachi, financial cities, large cities, FATA/Border Area and other cities (Aslam & Kang, 2013; Aslam et al., 2015). However, this study has divided the location of events into seven different categories by taking Gilgit and Kashmir as separate categories. Since, these two areas were administratively different from the provinces like the FATA, therefore, were given separate categories which makes total seven types of locations under study. Table 4 provides the description of all location of events used in this study.

Among these seven categories, events happening in the Karachi city fall into the first category. Karachi is the largest city having largest stock market in Pakistan; therefore, it has been given a separate category. The second category included events happening in financial cities. Financial cities mean cities which had equity markets except Karachi because Karachi has already been given a separate category. Third category included large cities that never had equity markets. These large cities were determined based on the population census of 2017 in Pakistan. Based on the results of census 10 most populated cities in Pakistan includes the cities of Karachi, Lahore, Islamabad, Quetta, Peshawar, Rawalpindi, Dera Ghazi Khan, Hyderabad, Faisalabad, and Multan (Government of Pakistan, 2017). Since, Karachi, Lahore and Islamabad were given separate categories, therefore, rest of the seven cities were taken as large cities.

Forth category includes the events happening in the FATA/Border area which is located between the Pakistan–Afghanistan border and was under federal administration Pakistan. Likewise, fifth and sixth category includes the events happening in Kashmir and Gilgit respectively which are the areas administered by Pakistan. Last and seventh category is "Others" which included all those cities that do not fall in the first six categories. Accordingly, all locations of event were also assigned seven location dummies. For instance, any event of terrorism happening in Karachi was assigned a value of 1, zero otherwise. For other six types of locations, terrorism events would be assigned dummies accordingly.

Table 4 Description of Location of Events

Sr. No.	Events	Notation	Description
1	Karachi	KC	Karachi is the largest city having largest stock market in Pakistan
2	Financial City	FC	Two cities, Lahore and Islamabad as both cities had stock markets
3	Large Cities	LC	Large cities including large financial cities which never had stock markets including Quetta, Peshawar, Rawalpindi, Dera Ghazi Khan, Hyderabad, Faisalabad, and Multan
4	FATA/Border Area	FBA	FATA means federally administered tribal areas. These areas are Pakistan Afghan border areas
5	Kashmir	KSH	Azad Kashmir is a region which is nominally self-governing state administered by Pakistan
6	Gilgit	Gilgit	Gilgit is a northernmost administrative territory in Pakistan
7	Others	Others	All cities that do not fall in first six categories

Source: Author's Own processing.

Following equations are developed to test the impact of terrorism events on equity returns based on location of event. The equation 5 models the impact of terrorism events on conventional equity market returns based on the event location.

$$Ret_{KSE} = \beta_1 Ret_{t-1} + \beta_2 KC + \beta_3 FC + \beta_4 LC + \beta_5 FBA + \beta_6 KSH + \beta_7 Gilgit + \beta_8 Others + \epsilon \quad (5)$$

and, following equation represents the impact of terrorism events on the Islamic equity market returns based on event location.

$$Ret_{KMI} = \beta_1 Ret_{t-1} + \beta_2 KC + \beta_3 FC + \beta_4 LC + \beta_5 FBA + \beta_6 KSH + \beta_7 Gilgit + \beta_8 Others + \epsilon \quad (6)$$

Where;
$Ret._{KSE}$= return of conventional equity market measured as natural logarithm of closing price of KSE 100 index on day t divided by closing price at day $t._1$
$Ret._{KMI}$= return of Islamic equity market measured as natural logarithm of closing price of KMI 30 index on day t divided by closing price at day $t._1$
Ret_{t-1} = indicates the lagged returns
KC = 1 if an event occurs in Karachi city; 0 otherwise

FC = 1 if an event occurs at Financial city; 0 otherwise
LC = 1 if an event occurs in Large City, 0 otherwise
FBA = 1 if an event occurs at FATA/Border Area; 0 otherwise
KSH = 1 if an event occurs at Kashmir, 0 otherwise
Gilgit = 1 if an event occurs at Gilgit, 0 otherwise
Others = 1 if an event in any city not included in first six categories, 0 otherwise
ε = error term

3.5. Islamic Calendar Months

For analyzing the impact of terrorism events on conventional and Islamic equity returns based on Islamic calendar months, this study tested an interaction effect of terrorism events with Islamic months on the conventional and Islamic equity market returns. This method has been used in the past studies where interactive dummies where used to identify the impact of two dummy variables on the equity returns (Jaisinghani, 2016; Halari et al., 2018; Tantisantiwong et al., 2018). Furthermore, it may be termed as interactive dummy where we take the product of two dummy variables (Gujarati, 2014). Accordingly, to measure the Islamic months, dummies were assigned. For instance, any event happening in the month of Muharram was assigned the value of 1, otherwise 0. Similarly, dummies were assigned to all other months. By assigning dummies to terrorism events and Islamic calendar months, the interaction effect of Islamic calendar months with terrorism events on conventional and Islamic equity market returns was examined. The interaction effect of terrorism events and Islamic calendar months on the equity returns was examined to identify whether the impact of terrorism on equity returns varies across different Islamic months.

This study used all Islamic months because every month has its own religious psychosocial impacts. Interaction effect of every Islamic month with terrorism events on conventional and Islamic equity returns was examined. Moreover, interaction effect of Islamic calendar months with terrorism events was examined by taking interaction of Islamic calendar months with event day, post event day one, post event day two and post event day three. Table 5 provides the detail on Islamic month and description of dummies to be assigned whereas the following equation describe the research models that are used to capture the impact of terrorism events on equity returns during different Islamic calendar months.

Table 5 Description of Islamic Calendar Months

Sr. No.	Events	Notation	Description
1	Muḥarram	MUH	Events happening in Muharram are assigned value of 1, zero otherwise
2	Safar	SAF	Events happening in Ṣafar are assigned value of 1, zero otherwise
3	Rabi' al-awal	RA	Events happening in Rabi' al-awal are assigned value of 1, zero otherwise
4	Rabi' al-thani	RTH	Events happening in Rabi' al-thani are assigned value of 1, zero otherwise
5	Jumada al-awal	JA	Events happening in Jumada al-awal are assigned value of 1, zero otherwise
6	Jumada al-thani	JTH	Events happening in Jumada al-thani are assigned value of 1, zero otherwise
7	Rajab	RAJ	Events happening in Rajab are assigned value of 1, zero otherwise
8	Sha'aban	SHA	Events happening in Sha'aban are assigned value of 1, zero otherwise
9	Ramaḍan	RAM	Events happening in Ramaḍan are assigned value of 1, zero otherwise
10	Shawwal	SHW	Events happening in Shawwal are assigned value of 1, zero otherwise
11	Duh al-Qidah	DQ	Events happening in Duh al-Qidah are assigned value of 1, zero otherwise
12	Duh al-Ḥijjah	DH	Events happening in Duh al-Ḥijjah are assigned value of 1, zero otherwise

Source: Author's Own Processing.

Following equations are developed to test the impact of terrorism on conventional and Islamic equity market returns based on different Islamic calendar months. Equation 07 describes the impact of terrorism events on conventional equity market returns based on different Islamic calendar months.

$$Ret_{KSE} = \beta_1 Ret_{t-1} + \beta_2 Neg_{t-3} + \beta_3 Neg_{t-2} + \beta_4 Neg_{t-1} + \beta_5 Eventday_t + \beta_6 Pos_{t+1} + \beta_7 Pos_{t+2} + \beta_8 Pos_{t+3} + \beta_9 MUH + \beta_{10} SAF + \beta_{11} RA + \beta_{12} RTH + \beta_{13} JA + \beta_{14} JTH + \beta_{15} RAJ + \beta_{16} SHA + \beta_{17} RAM + +\beta_{18} SHW + \beta_{19} DQ + \beta_{20} DH + \beta_{21} MUH * Day\ Dummy + \beta_{22} SAF * Day\ Dummy + \beta_{23} RA * Day\ Dummy + \beta_{24} RTH * Day\ Dummy + \beta_{25} JA * Day\ Dummy + \beta_{26} JTH * Day\ Dummy + \beta_{27} RAJ * Day\ Dummy + \beta_{28} SHA * Day\ Dummy + \beta_{29} RAM *$$

$$Day\ Dummy + \beta_{30}SHW * Day\ Dummy + \beta_{31}DQ * Day\ Dummy + \beta_{32}DH * Day\ Dummy + \epsilon \quad (7)$$

And following equation measures the impact of terrorism events on the Islamic equity market returns based on different Islamic calendar months.

$$Ret_{KMI} = \beta_1 Ret_{t-1} + \beta_2 Neg_{t-3} + \beta_3 Neg_{t-2} + \beta_4 Neg_{t-1} + \beta_5 Eventday_t + \beta_6 Pos_{t+1} + \beta_7 Pos_{t+2} + \beta_8 Pos_{t+3} + \beta_9 MUH + \beta_{10} SAF + \beta_{11} RA + \beta_{12} RTH + \beta_{13} JA + \beta_{14} JTH + \beta_{15} RAJ + \beta_{16} SHA + \beta_{17} RAM + +\beta_{18} SHW + \beta_{19} DQ + \beta_{20} DH + \beta_{21} MUH * DayDummy + \beta_{22} SAF * DayDummy + \beta_{23} RA * DayDummy + \beta_{24} RTH * DayDummy + \beta_{25} JA * DayDummy + \beta_{26} JTH * DayDummy + \beta_{27} RAJ * DayDummy + \beta_{28} SHA * DayDummy + \beta_{29} RAM * DayDummy + \beta_{30} SHW * DayDummy + \beta_{31} DQ * DayDummy + \beta_{32} DH * DayDummy + \epsilon \quad (8)$$

$Ret._{KSE}$= return of conventional equity market is measured as natural logarithm of closing price of KSE 100 index on day t divided by closing price at day t_{-1}
$Ret._{KMI}$= return of Islamic equity market measured as natural logarithm of closing price of KMI 30 index on day t divided by closing price at day t_{-1}
Ret_{t-1} = indicates the lagged returns
MUH = 1 if an event occurs in the month of Muharram; 0 otherwise
SAF = 1 if an event occurs in the month of Safar; 0 otherwise
RA= 1 if an event occurs in the month of Rabi' al-awal; 0 otherwise
RTH = 1 if an event occurs in the month of Rabi' al-thani, 0 otherwise
JA = 1 if an event in occur in the month of Jumada al-awal, 0 otherwise
JTH = 1 if an event occurs in the month of Jumada al-thani; 0 otherwise
RAJ = 1 if an event occurs in the month of Rajab; 0 otherwise
SHA = 1 if an event occurs in the month of Sha'aban; 0 otherwise
RAM = 1 if an event occurs in the month of Ramaḍan, 0 otherwise
SHW = 1 if an event occurs in the month of Shawwal, 0 otherwise
DQ = 1 if an event occurs in the month of Duh al-Qidah, 0 otherwise
MUH*Day Dummy = Interaction of Muharram with the day dummies (Such as event day, post day one, post day two and post day three)
SAF*Day Dummy = Interaction of Safar with the day dummies (Such as event day, post day one, post day two and post day three)
RA*Day Dummy = Interaction of Rabi' al-awal with the day dummies (Such as event day, post day one, post day two and post day three)
RTH*Day Dummy = Interaction of Rabi' al-thani with the day dummies (Such as event day, post day one, post day two and post day three)

JA*Day Dummy = Interaction of Jumada al-awal with the day dummies (Such as event day, post day one, post day two and post day three)
JTH*Day Dummy = Interaction of Jumada al-thani with the day dummies (Such as event day, post day one, post day two and post day three)
RAJ*Day Dummy = Interaction of Rajab with the day dummies (Such as event day, post day one, post day two and post day three)
SHA*Day Dummy = Interaction of Sha'aban with the day dummies (Such as event day, post day one, post day two and post day three)
RAM*Day Dummy = Interaction of Ramadan with the day dummies (Such as event day, post day one, post day two and post day three)
SHW*Day Dummy = Interaction of Shawwal with the day dummies (Such as event day, post day one, post day two and post day three)
DQ*Day Dummy = Interaction of Duh al-Qidah with the day dummies (Such as event day, post day one, post day two and post day three)
DH*Day Dummy = Interaction of Duh al-Ḥijjah with the day dummies (Such as event day, post day one, post day two and post day three)
ε = error term

4. Analysis and Findings

4.1. Terrorism Events and Stock Market

This study has applied two different types of tests to examine the impact of terrorism on the equity market returns. Table 6 provides the results by using the ordinary least square regression and Table 6 provides the results by using the GARCH (1,1) model.

Table 6 Terrorism Events and Stock Market using OLS Regression

		Conventional			Islamic	
Variable	**VIF**	**Coefficient**	**SE**	**VIF**	**Coefficient**	**SE**
Ret_{t-1}	1.011	0.109063***	0.032167	1.009	-0.03638	0.08414
Neg_1	1.020	0.001475	0.000927	1.017	0.00233**	0.001001
Neg_2	1.016	0.002714***	0.000926	1.015	0.002223**	0.000989
Neg_3	1.018	0.000371	0.001115	1.018	0.000264	0.001172
Event day	1.018	0.000757	0.001037	1.018	0.001134	0.001137
Pos_1	1.016	0.000852	0.000968	1.015	0.002793*	0.001609
Pos_2	1.015	0.001646*	0.000843	1.017	0.000205	0.001464
Pos_3	1.018	-0.000037	0.001079	1.016	0.000237	0.000981
Durbin Watson test DW		2.001981			1.998312	
Breusch–Pagan test prob.		.000			.000	

Serial Correlation LM Test prob.	1	1

*Note: Rett-1 indicate one period lagged return, Neg1 is a dummy variable used to indicate one day before the event day, Neg2 is a dummy variable used to indicate two days before the event day, Neg3 is a dummy variable used to indicate three days before the event day, Event day is a dummy variable used to indicate the day event happened, Pos1 is a dummy variable used to indicates one day after the event, Pos2 is a dummy variable used to indicates two days after the event, Pos3 is a dummy variable used to indicates three days after the event and *,**,*** indicates ten percent, five percent and one percent level of significance.*

Source: Author's Own Processing.

4.2. Terrorism Events and Stock Market using OLS Regression

Table 6 shows the conventional and Islamic equity market reaction towards terrorism events. To measure the impact of terrorism events on the conventional and Islamic equity market returns, seven distinct day's dummy variables were used. These seven distinct dummy variables including event day, three days, two days and one day before the terrorism event to three days, two days and one day after the event. The dependent variables used are KSE-100 index returns and KMI-30 Index returns representing conventional and Islamic equity market returns. The estimated value of Durbin–Watson Statistics is 2.001981 which indicates that there is no statistical evidence that the error terms are autocorrelated. Durbin Watson value in the case of Islamic equity market returns is 1.998312 indicating absence of autocorrelation. Likewise, the insignificant value of LM test of autocorrelation indicates the absence of serial correlation in the data. However, the significance of F-statistic in Breusch–Pagan test reveals that the data violates the homoscedasticity assumption. To rectify this issue, the white standard error consistent regression model is used.

Regarding the multi-collinearity, the VIF (variance inflation factors) values for conventional and Islamic equity markets are within the tolerance limit indicating absence of multicollinearity in the data. The impact of lagged returns is strongly significantly positive on the conventional equity market returns at one percent level of significance whereas the impact of lagged returns is insignificant on the Islamic equity market returns. Likewise, the effect of two days pre-event dummy on conventional equity market returns is strongly significant positive whereas effect of two days and three days pre-event dummies on Islamic equity markets is significantly positive. In regard to the day dummies for terrorism events, findings of this study indicated that market do not respond to the terrorist attacks on the event day as the coefficient value on the event day is insignificant for conventional and Islamic equity markets. These findings are consistent with the previous studies where it was found that equity markets are efficient in absorbing the shocks by the terrorism events (Eldor & Melnick, 2004; Barry Johnston & Nedelescu, 2006).

However, the market reaction is weakly significant at ten percent level of significance two days after the events for conventional equity market whereas, the market reaction is weakly significant at ten percent level of significance day after the event for Islamic equity market returns. It indicates that market do not respond immediately after the event, however, market responds in the subsequent days after the event day. Surprisingly, the market reaction towards the terrorism events is positive in the Pakistani equity market; however, small coefficient value indicates weak reaction magnitude. However, previous studies have reported some instances of positive market reactions after terrorism events. For instance, Chen and Siems (2004) reported positive market reactions to the Oklahoma City bombing, the Korean Air bombing in November 1987, and the Pan Am bombing over Lockerbie, Scotland in December 1988.

Table 7 Terrorism Events and Stock Market using GARCH (1,1)

	Conventional		**Islamic**	
Variable	**Coefficient**	**SE**	**Coefficient**	**SE**
Mean Equation				
Ret_{t-1}	0.172255***	0.025635	0.149299***	0.026181
Neg_1	0.001528**	0.000689	0.002138*	0.001153
Neg_2	0.002026***	0.000753	0.002127**	0.000977
Neg_3	0.000083	0.000761	0.000343	0.000922
Event day	0.000701	0.000716	0.000835	0.001082
Pos_1	0.000410	0.000698	0.000574	0.000815
Pos_2	0.001748*	0.000939	0.001493	0.000995
Pos_3	-0.000661	0.000947	-0.001293	0.001117
Variance Equation				
C	0.000008***	0.000001	0.000007***	0.000001
RESID(-1)^2	0.148617***	0.016777	0.144933***	0.009006
GARCH(-1)	0.776349***	0.020033	0.810725***	0.008034
Lagretpsx	-0.001515***	0.000150	-0.001487***	0.000137
Neg_1	-0.000011	0.000007	0.000009	0.000018
Neg_2	-0.000001	0.000009	0.000000	0.000013
Neg_3	-0.000005	0.000007	-0.000009	0.000010
Event day	0.000004	0.000007	0.000020	0.000015
Pos_1	0.000001	0.000006	-0.000029**	0.000012
Pos_2	0.000012*	0.000007	0.000023**	0.000011
Pos_3	0.000012	0.000009	0.000003	0.000011

Note: C indicates the intercept term for the equation, Ret_{t-1} indicate one period lagged return, Neg_1 is a dummy variable used to indicate one day before the event day, Neg_2 is a dummy variable used to indicate two days before the event day, Neg_3 is a dummy variable used to indicate three days before the event day, Event day is a dummy variable used to indicate the

*day event happened, Pos_1 is a dummy variable used to indicates one day after the event, Pos_2 is a dummy variable used to indicates two days after the event, Pos_3 is a dummy variable used to indicates three days after the event and *,**,*** indicates ten percent, five percent and one percent level of significance.*

Source: Author's Own Processing.

4.3. Terrorism Events and Stock Market using GARCH (1,1)

Investors are not only concerned about the returns on their investments but also about the volatility prevalent in the returns. Therefore, to further examine the impact of terrorism events on the equity markets with regards to the volatility of returns, this study has used the GARCH (1,1) model. The results are obtained to capture the impact of terrorism events on the volatilities of conventional and Islamic equity market returns. The mean and variance equation reported in the Table 7 indicates the findings of GARCH (1,1) model. Findings indicate that volatility in conventional equity returns is weakly significant positive at ten percent level of significance two days after the event. However, the conventional equity market returns are not affected by the terrorism events in Pakistan. The equity market is efficient and reflects the information efficiently.

Regarding the volatility of Islamic equity returns, findings indicate that volatility of Islamic equity returns is significantly negative at five percent level of significance after one day of event and it becomes significantly positive at five percent level of significance two days after the event. However, the volatility in conventional and Islamic equity returns is insignificant on the event day. The findings indicate that direct impact of terrorism events on the conventional and Islamic equity market returns is insignificant in the aftermath of terrorism events. To further examine the impact of terrorism events on the conventional and Islamic equity market returns, the sample of events is divided in different types of terrorism events. The following section provides the impact of different target types of terrorism events on the conventional and Islamic equity returns.

4.3.1. Discussion on Terrorism Events and Stock Market

Based on the direct impact of terrorism on the equity markets, the findings indicate an insignificant market response on the event day for conventional and Islamic equity market returns. However, the market response is significant positive at five percent level of significance two days after the terrorism event for the conventional equity market returns and weakly significant positive at ten percent level of significance one day after the terrorism event for Islamic equity market returns. The negative effects of terrorism on the society are well known (Danieli et al., 2005). However, increasing literature also evidenced positive effect of terrorism or trauma on communities. However, productive development because of trauma instead of

stress, disorder and anxieties due to trauma which survivors faced have been observed through a deficient lens (Quiros, 2010). The positive impact of terrorism events on the equity market has been previously documented by the Chen and Siems (2004). Likewise, Chesney et al. (2011), also reported positive market reactions towards terrorism events and found that impact of terrorism on equity market varies where response of some indices was negative and other indices responded positively. Furthermore, Ramiah et al. (2010) also reported positive equity markets response towards Bali terrorist attacks on some sectors. Likewise, Liargovas and Repousis (2010) examined the impact of international terrorism events on the Greek banks and reported mixed findings where response of Greek bank stocks was negative towards September 9, 2001 attack and positive towards London attacks. In addition, Greek banks stocks were insensitive towards Madrid attacks. Also, Hobbs et al. (2016), showed that the mean return with a significantly negative market return occurring for some of the events, but with significant positive returns occurring on the day of many other events. However, the market response towards terrorism events observed in this study is very small which indicates that Pakistani equity markets are insensitive to the terrorism events. Likewise, Tahir Suleman (2012) reports that oil and gas industry returns do not respond to the terrorism events. Furthermore, it was reported that volatility of returns is also not affected by terrorism and volatility remained negative in all sectors. All these arguments indicate that terrorism events have become normal for the society, therefore, the magnitude of market reaction towards these events is very small.

Findings of this study have reported very minor reaction magnitude of conventional and Islamic equity markets towards terrorism which indicates that overall equity markets in Pakistan have become desensitized towards terrorist attacks in Pakistan. The reason might be frequency of terrorism events, since Pakistan is facing terrorism issue from last many years, so, it might possible that over time, continued terrorist attacks have also significantly changed the individual response towards these events. These results can also be referred to the efficient market hypothesis in that markets are efficient and recover immediately after happening of these events. It also indicates that any information regarding terrorist attacks becomes easily available to all market participants, and no one can outperform in the equity market based on this information. However, to further examine whether the market reacts differently to different target types of terrorism, this study has examined the reaction of conventional and Islamic equity markets towards different target types of terrorism in the following section.

4.4. Terrorism Target Types and Stock Market

To examine the market reaction towards terrorism events based on the target types of terrorism events, this study has used ordinary least square regression. Furthermore, this study has used GARCH (1,1) to examine the risk of conventional and Islamic equity market returns based on the terrorism target types.

Table 8 Terrorism Target Types and Stock Market using OLS Regression

	Conventional			Islamic		
Variable	**VIF**	**Coefficient**	**SE**	**VIF**	**Coefficient**	**SE**
Ret_{t-1}	1.006104	0.116292***	0.031978	1.005971	-0.031605	0.084995
Armed Forces	1.056722	0.003353**	0.001654	1.056398	0.004503**	0.001964
Business	1.030582	-0.018365***	0.006695	1.030511	-0.012373***	0.004209
Educational	1.001032	-0.019347***	0.004996	1.001178	-0.024426***	0.00629
Government	1.000068	0.000701	0.003147	1.00017	0.000578	0.003677
Private Citizen	1.002762	-0.000315	0.001569	1.002804	-0.000101	0.001695
Religious Figures	1.029236	0.002232	0.001832	1.02944	0.002312	0.002186
Other Attacks	1.034121	0.004904*	0.002758	1.034257	0.003336	0.003004
Durbin Watson test DW		2.004262		1.989561		
Breusch–Pagan test prob		0.000		0.0000		
Serial Correlation LM Test prob.		1		1		

Note: $Ret_{t-1,}$ indicate the one period lagged return. Armed Forces is a dummy variable which takes value of 1 for any terrorist attack where target of attack is armed forces zero otherwise, Business is a dummy variable which takes value of 1 for any terrorist attack where target of attack is business places zero otherwise, Educational Institutes is a dummy variable which takes value of 1 for any terrorist attack where target of attack is educational institute zero otherwise, Government is a dummy variable which takes value of 1 for any terrorist attack where target of attack is government offices zero otherwise, Private citizens is a dummy variable which takes value of 1 for any terrorist attack where target of attack is private citizen zero otherwise, Religious figures is a dummy variable which takes value of 1 for any terrorist attack where target of attack is any religious figure or institute zero otherwise, Other attacks is a dummy variable which takes value of 1 for any terrorist attack other than previously

*mentioned zero otherwise and *,**,*** indicates ten percent, five percent and one percent level of significance.*

Source: Author's Own Processing.

4.4.1. Terrorism Target Types and Stock Market using OLS Regression

Table 8 provides the result for impact of terrorism on equity market returns based on the different target types of terrorism events. The impact of different target types of terrorism events is examined on conventional and Islamic equity market returns. Lagged equity market returns are controlled in the model following the previous studies (Eldor & Melnick, 2004; Drakos, 2010; Tahir Suleman, 2012; Tavor, 2016). Results of Table 8 indicate strongly significant positive impact of lagged returns on the conventional and Islamic equity market returns at one percent level of significance. In addition, there are other seven independent distinct dummy variables reflecting the types of terrorism events including attacks on armed forces, businesses, educational institutes, government, private citizens, religious figures and other attacks as shown in Table 8.

The estimated value of Durbin–Watson Statistic is 2.004262 and 1.989561 for conventional and Islamic equity market models which indicates that there is no statistical evidence that the error terms are autocorrelated. The value of F-statistic in Breusch–Pagan test confirms that the independent variables are jointly not insignificant, so it identifies the evidence of heteroscedasticity, therefore, this study used the white test to solve the heteroscedasticity problem for conventional and Islamic equity return models. The VIF values for conventional and Islamic equity market return models are also within the tolerance level. In regard to the impact of different target types of terrorism events, results of Table 7 indicate that only attack on business and education institutes are particularly devastating for the equity markets. The coefficients for business and educational institute are negative which indicates that increase in terrorist attack is associated with reduction in conventional equity market returns significant at one percent level indicating strong significant impact. Furthermore, results indicated that conventional equity market responds significantly positive to the attacks on the armed forces at five percent level of significance. However, the coefficient value for armed forces is very low indicating very minor change in the equity returns in response to the attacks on armed forces. Likewise, other attacks are also responded positively by the conventional equity market significant at ten percent level.

In regard to Islamic equity market response towards terrorism events based on the target types, the findings indicate that attacks on business places and educational institutes are negatively responded by the Islamic equity market. Furthermore, the market reaction is strongly significant negative at one percent level of significance.

The Islamic equity reaction towards terrorist attacks on armed forces shows significantly positive coefficient value at five percent level of significance. However, the coefficient value is very low which indicates very low response magnitude towards attacks on armed forces. Besides, all other types of attacks such as attacks on government, private citizens and religious figures are insignificant which indicates that conventional and Islamic equity market returns do not respond to these types of events.

Table 9 Terrorism Target Types and Stock Market using GARCH (1,1)

	Conventional		Islamic	
Variable	**Coefficient**	**SE**	**Coefficient**	**SE**
Mean Equation				
Ret_{t-1}	0.119457***	0.045156	-0.00847	0.057292
Armed Forces	0.003291*	0.001982	0.004971***	0.001918
Business	-0.018138***	0.006961	-0.0205	0.022588
Educational Ins.	-0.019636***	0.007207	-0.02693***	0.005596
Government	0.000521	0.006840	0.001024	0.009583
Private Citizen	-0.000119	0.001907	0.002604	0.002255
Religious Figures	0.002131	0.003829	0.000723	0.00327
Other Attacks	0.004694	0.003320	0.00026	0.004512
Variance Equation				
C	0.000070***	0.000020	0.0001130***	0.0000307
RESID (-1) ^ 2	0.119700***	0.046130	0.1089670***	0.0213760
GARCH (-1)	0.552576***	0.124538	0.5606200***	0.1121560
Ret_{t-1}	-0.001268*	0.000672	-0.0015110	0.0009720
Armed Forces	-0.000072***	0.000022	-0.000099***	0.0000377
Business	-0.000031	0.000053	0.0001270	0.0001650
Educational Ins.	-0.000112	0.000222	-0.000251***	0.0000199
Government	-0.000078	0.000065	-0.0001190	0.0000881
Private Citizen	-0.000075***	0.000023	-0.000091***	0.0000539
Religious Figures	-0.000046	0.000040	-0.000156***	0.0000343
Other Attacks	-0.000056*	0.000029	-0.0001030*	0.0000388

Note: C indicates the intercept term for the equation, Ret_{t-1} indicate the one period lagged return. Armed Forces is a dummy variable which takes value of 1 for any terrorist attack where target of attack is armed forces zero otherwise, Business is a dummy variable which takes value of 1 for any terrorist attack where target of attack is business places zero otherwise, Educational Institutes is a dummy variable which takes value of 1 for any terrorist attack where target of attack is educational institute zero otherwise, Government is a dummy variable which takes value of 1 for any terrorist attack where target of attack is government offices zero otherwise, Private citizens is a dummy variable which takes value of 1 for any

*terrorist attack where target of attack is private citizen zero otherwise, Religious figures is a dummy variable which takes value of 1 for any terrorist attack where target of attack is any religious figure or institute zero otherwise, Other attacks is a dummy variable which takes value of 1 for any terrorist attack other than previously mentioned zero otherwise and *,**,*** indicates ten percent, five percent and one percent level of significance.*

Source: Author's Own Processing.

4.4.2. Terrorism Target Types and Stock Market using GARCH (1,1)

Table 9 shows the results of conventional and Islamic equity market returns in response to the terrorism events based on the target type using GARCH (1,1) model. The mean equation of the Table 9 shows the impact of different target types of terrorism events on the equity returns. The conventional equity market returns are strongly significant negative at one percent level of significance in response to the terrorist attacks on business places and educational institutes. However, the conventional equity market reaction is weakly significant positive at ten percent level of significance for the terrorist attacks on the armed forces. Furthermore, the Table 9 shows that Islamic equity market returns are also strongly significant negative at one percent level of significance for terrorist attacks on the educational institutes and strongly significant positive at one percent level of significance for the terrorist attacks on the armed forces.

The variance equation in the Table 9 shows the volatilities of equity returns in response to the different target types of terrorist attacks. The findings indicate negative volatility in the conventional and Islamic equity market returns based on target types of events. The negative coefficient for conventional equity market returns in the variance equation indicates that volatility reduces after the happening of terrorism events such as attacks on armed forces, private citizens and other attacks. Furthermore, the conventional equity market risk is strongly significant at one percent level of significance in response to the attacks on armed forces and private citizens and weakly significant at ten percent level of significance in response to other attacks. However, the coefficient values are very low for all the types of attacks which indicate very minute change in the conventional equity market risk in response to these attacks. Furthermore, terrorist attacks on the business places, educational institutes and religious figures indicates that risk in conventional equity market is not affected by these target types.

Table 8 also provides the risk and return prevalent in the Islamic equity market returns after the terrorism events based on the target types. Results indicate that Islamic equity market reacts strongly positive to the attacks on armed forces and negatively to the attacks on the educational institutes at one percent level of significance. Regarding the risk, findings indicate that Islamic equity market volatility decreases after the terrorism events. The coefficient value in the variance

equation for the armed forces, educational institutes, private citizens, religious figures are strongly significant negative at one percent level of significance implying that volatility of Islamic equity market decreases after terrorist attacks. However, the coefficient value for other attacks is weakly significant negative at ten percent level. Furthermore, insignificant coefficient values of attacks on business and government imply that market risk is not affected by such target types. The coefficient values for all the variables are very low which indicates very low magnitude of risk in response to different target types of terrorist attacks.

4.4.3. Discussion on Terrorism Target Type and Stock Market

In regard to market reaction towards different target types of terrorists, the findings of this study showed different results as compared to the overall effects of terrorism on the conventional and Islamic equity returns. The findings indicated that market reaction is strongly significant negative at one percent level of significance in case of attacks on the educational institutes and businesses whereas the market reaction is significantly positive at five percent level of significance in case of attacks on the armed forces. However, the equity market does not respond to the attacks on government offices, private citizens and property and religious figures. The reaction of Islamic equity market is identical to the conventional equity market returns by showing positive market reaction to attacks on armed forces and negative response to the attacks on business and educational institutes.

The negative market reaction of conventional equity returns towards the terrorist attacks on business places in this study is consistent with the findings of Aslam et al. (2015). According to their results, Dhaka Stock Exchange, Jakarta Stock Exchange, Colombo and Philippines Stock Exchanges response towards terrorist attacks on business is significantly negative. Likewise, this study also examined the market reaction of Islamic equity market towards terrorist attack on business and reported significant negative market reaction.

The negative equity market response towards attacks on businesses implies that investors in Pakistan demands security to keep their investments safe. Terrorism events on business places may affects the investors by producing distress. Furthermore, the government inability to control these events reduces investor confidence and trust. Therefore, absence of investor confidence compels them to shift their wealth in other safe markets and foreign and local investment moves to the countries that are less prone to terrorism. (Sandler & Enders, 2008)

These findings can also be referred to the Prospect theory in several ways. Prospect theory postulates that one event becomes the reference for another similar event (Tversky & Kahneman, 1975; Kahneman & Tversky, 1979; Tversky & Kahneman, 1992). Since, the attacks on business places implies that investments are not safe

which may increase the level of unemployment in the country, increases organizational risk and decreases the rates of returns. Thus, negative equity market response towards attacks on businesses indicates that investors are expecting reduced economic activity in the country. Accordingly, based on prospect theory, investors expect more people are to indulge in these types of activities due to reduced economic activity.

Likewise, findings of this study indicate that the market reaction is significant negative towards terrorist attacks on the educational institutes for conventional and Islamic equity markets. Despite being the low literacy rate country in comparison to other countries, the literacy ratio however is improving in Pakistan (Rehman et al., 2015). It indicates that people are becoming more aware about the importance of education (Andrabi et al., 2009), therefore, might become more sensitive towards the attacks on educational institutes. Previous studies states that unemployment, poverty and education are linked with the terrorism (Sayre, 2009; Poveda, 2011). Furthermore, the growth in formal education in Pakistan has increased since the 9/11 (Andrabi et al., 2009) which also implies that increased inclination towards formal education increased the awareness among people and they became more sensitive towards attacks on educational institutes.

Based on the prospect theory, an approach to justify these findings might be that individuals respond negatively to those events which shape the general perception that more negative events are likely to happen. These results indicate that investors in Pakistan react negatively towards attacks on educational and businesses institutes. The reasons for this perception might be caused by low education and unemployment. People with less education and low income are more likely to join the militant groups. Hence, these types of attacks create fear among people. On the other side, individuals may become optimistic even for some negative events when they perceive no further terrorist attack will occurred in the future. For instance, the findings of this study have indicated positive equity market reaction towards attacks on armed forces. Furthermore, this study also tested the Islamic equity market reaction towards terrorist attacks on armed forces and found similar results.

The investors become optimistic based on the perception that attacks on military indicate that armed forces are fighting the militant groups. Furthermore, they may perceive that government has initiated antiterrorism policy which may reduce future terrorist attacks. In support of this argument, results of Afik et al. (2016) can be referred to where positive equity market response towards antiterrorism acts by government has been documented. In regard to the market reaction towards terrorist attacks on government, private citizens, and religious figures, this study found insignificant. These results are in line with the results of Aslam et al. (2015). This study also tested the Islamic equity market reaction towards terrorism target types

and found that the Islamic equity market reaction is similar to the conventional equity market.

4.5. Terrorism Location and Stock Market

This study has also examined the market reaction towards terrorism events happening at different locations. For this purpose, this study has used ordinary least square regression. In addition, the risk of conventional and Islamic equity markets in response of terrorism events is examined using GARCH (1,1)

Table 10 Terrorism Location and Stock Market using OLS Regression

	Conventional			Islamic		
Variable	**VIF**	**Coefficient**	**SE**	**VIF**	**Coefficient**	**SE**
Ret_{t-1}	1.005474	0.113935***	0.031913	1.004373	-0.033029	0.084752
Karachi	1.009002	-0.003071***	0.000804	1.008611	-0.00047	0.001038
Financial City	1.000127	0.005748**	0.002330	1.000068	0.00561***	0.001995
Large City	1.005851	-0.002470	0.002813	1.005711	-0.002136	0.002781
FATA	1.004396	0.004184***	0.001393	1.00358	0.005474***	0.001785
Other Locations	1.014294	-0.000017	0.001745	1.014546	-0.000155	0.001891
Durbin Watson test DW		1.998668			1.989561	
Breusch–Pagan test prob.		.000			.000	
Serial Correlation LM Test prob.		1			1	

*Note: Ret_{t-1} indicate the one period lagged return. Karachi is a dummy variable which takes the value of 1 for any terrorist attack happening in Karachi zero otherwise, Financial city is a dummy variable which takes the value of 1 for any terrorist attack happening in financial cities zero otherwise, Large city is a dummy variable which takes the value of 1 for any terrorist attack happening in large cities zero otherwise, FATA is a dummy variable which takes the value of 1 for any terrorist attack happening in FATA zero otherwise, Other cities is a dummy variable which takes value of 1 for any terrorist attack happening in the cities other than previously mentioned zero otherwise and *,**,*** indicates ten percent, five percent and one percent level of significance.*

Source: Author's Own Processing.

4.5.1. Terrorism Location and Stock Market using OLS Regression

Table 10 explains the conventional and Islamic equity market reactions towards terrorist attacks happening at different locations. For this purpose, this study used six distinct location dummy variables including, lagged returns, Karachi, financial city, large city, FATA and other cities. The estimated value of Durbin Watson statistics is 1.998668 for conventional equity market and 1.989561 for Islamic equity market

return which indicates absence of autocorrelation. The significant value of F-statistic in Breusch–Pagan test confirms the presence of heteroscedasticity in the data. To solve this problem, this study has used white heteroscedasticity consistent estimates. Furthermore, VIF values for both models, conventional and Islamic equity markets are within the tolerance limit indicating absence of multicollinearity among the independent variables.

The results indicate that lagged returns have strongly significant positive impact on the conventional equity market returns at one percent level of significance. Moreover, these results indicate that terrorist attack is particularly disturbing to equity market if the attack occurred in Karachi. However, terrorist attacks in financial cities are responded significantly positive by the conventional equity market at five percent level of significance. The financial cities in this study represent the cities which had equity markets except the Karachi which has been given separate location category. The market reaction towards the terrorism events happening in the Karachi is strongly significant negative at one percent level of significance implying that investor feel insecure in the aftermath of terrorism events happening in the Karachi. Regarding the market reaction towards the terrorism events happening in FATA, the conventional equity market returns show strongly significant positive response at one percent level of significance.

However, the Islamic equity market reaction is insignificant for the terrorism events happening in the Karachi which indicates that Islamic equity market is insensitive towards terrorism events happening in Karachi. Furthermore, Islamic equity market responds strongly significant positive at one percent level of significance towards attacks in financial cities and FATA. However, the coefficient values are very small which indicates that magnitude of the reaction is very small. It implies that conventional and Islamic equity markets are not very much sensitive towards the events happening at different location because of the small magnitude of reactions. Overall, these findings indicate that attacks in FATA and financial city have positive impact on conventional and Islamic equity market returns while terrorism events in Karachi have negative impact on conventional equity market.

Table 11 Terrorism Location and Stock Market using GARCH (1,1)

	Conventional		**Islamic**	
Variable	**Coefficient**	**SE**	**Coefficient**	**SE**
Mean Equation				
Ret_{t-1}	0.117696***	0.042899	-0.01552	0.055649
Karachi	-0.00244	0.034097	-0.00088	0.009411
Financial City	0.005707	0.003544	0.004897	0.003321
Large City	-0.002455	0.002371	-0.0016	0.002623
FATA	0.004341**	0.001868	0.006044***	0.001781

Other Cities	0.000233	0.00182	0.001039	0.003946
Variance Equation				
C	0.0000669***	0.0000175	0.000107***	0.000027
RESID (-1)^2	0.1157400***	0.0426290	0.129520***	0.023098
GARCH (-1)	0.5436390***	0.1163630	0.552363***	0.099728
Ret_{t-1}	-0.0017100***	0.0006390	-0.001596*	0.000866
Karachi	-0.0000819*	0.0000436	-0.000221***	0.000031
Financial City	-0.0001090*	0.0000591	-0.000214***	0.000021
Large City	-0.0000121	0.0000329	-0.000092***	0.000032
FATA	-0.0000821***	0.0000132	-0.000163***	0.000009
Other Cities	-0.0000575***	0.0000131	0.000008	0.000029

*Note: C indicates the intercept term for the equation, Ret_{t-1} indicate the one period lagged return. Karachi is a dummy variable which takes the value of 1 for any terrorist attack happening in Karachi zero otherwise, Financial city is a dummy variable which takes the value of 1 for any terrorist attack happening in financial cities zero otherwise, Large city is a dummy variable which takes the value of 1 for any terrorist attack happening in large cities zero otherwise, FATA is a dummy variable which takes the value of 1 for any terrorist attack happening in FATA zero otherwise, Other cities is a dummy variable which takes value of 1 for any terrorist attack happening in the cities other than previously mentioned zero otherwise and *,**,*** indicates ten percent, five percent and one percent level of significance.*

Source: Author's Own Processing.

4.5.2. Terrorism Location and Stock Market using GARCH (1,1)

Table 11 shows the results of impact of terrorism on the Islamic equity market returns based on the location of event using GARCH. The mean equation shows the impact of terrorism events on the conventional and Islamic equity market returns based on event location. The variance equation shows the impact of terrorism events on the risk of conventional and Islamic equity markets based on event location. The mean equation in Table 11 indicates that conventional and Islamic equity markets are insensitive to the location of terrorism events with exception of FATA. The terrorist attacks in FATA are responded significantly positive at five percent level of significance by the conventional equity market and strongly significant positive at one percent level of significance by the Islamic equity market.

In addition, variance equation in Table 11 shows the risk of conventional and Islamic equity market returns in response to the terrorism events based on the location of terrorism events. The results indicate that risk of conventional equity market reduces after the terrorism events based on the location of terrorism events. The conventional equity market risk reduces after the terrorist attacks in Karachi, financial cities, FATA and other cities. The coefficients of lagged returns, FATA and other cities are

strongly significant negative at one percent level of significance whereas the coefficients for Karachi and financial cities are weakly significant negative at ten percent level of significance for conventional equity market model.

However, the conventional equity market risk is not affected by the terrorism events in large cities. The impact of terrorism events on the risk of Islamic equity market also reduces after the terrorism events happening Karachi, financial cities, large cities and FATA. The coefficients for Karachi, financial cities, large cities and FATA are strongly significant negative at one percent level of significance whereas weakly significant negative at ten percent level of significance for lagged returns in Islamic equity market model. On the other side, the risk of Islamic equity market is not affected by the terrorism events happening in other cities. Overall findings show very small coefficient values for all the cities which indicate small degree of market reaction by conventional and Islamic reaction towards terrorism events based on their location.

4.5.3. Discussion on Findings of Terrorism Location and Stock Market

Findings of this study indicate mixed results regarding the equity market reaction to terrorism events based on the event location. For instance, findings of this study indicated that conventional equity market reaction is strongly significant negative at one percent level of significance to the terrorism events happening in Karachi and significantly positive to the terrorism events happened in financial cities at five percent level of significance. Furthermore, the market reaction is strongly significant positive at one percent level of significance to the terrorism events happening in FATA.

Furthermore, the market did not respond to the terrorism events happening at other locations implying that conventional equity market is insensitive to these events. On contrary, Islamic equity market responds only to the events happening in financial cities and FATA. However, Islamic equity market reaction is insignificant to the terrorist attacks at all other locations. These findings are consistent with the findings of previous studies, which report varying equity market reaction towards terrorism events happening at different locations (Barry Johnston & Nedelescu, 2006; Aslam & Kang, 2013).

Karachi is the largest city of Pakistan in terms of its population and business activity. Furthermore, it is one of the most important cities of the world in terms of population, economic potential and geo-strategic location (Qureshi, 2010). The negative conventional equity market reaction towards terrorism events happening in Karachi indicates that investors feel insecurity for their investments thus responds negatively to these types of events. However, positive equity market response

towards terrorism events in financial cities and FATA shows their insensitivity towards these events.

These findings can be seen by referring to the local bias hypothesis. The prospect theory developed by Kahneman and Tversky (1979) which explain the decision-making under uncertainty has laid down the basis for different behavioral biases which suggests that the investment decision-making process depends on different types of behavioral biases. The findings of this study regarding the market reaction towards terrorism at different locations can be referred to the local bias hypothesis. Terrorism events in Karachi might be responded negatively because of greater effect on the sentiment of market operators due to the fact they were under personal threat and because the attacks were extremely apparent. By referring to same hypothesis, this study contends that local bias effect exists for the investors in Pakistani equity markets. Furthermore, the findings support the prospect theory perspective that the investor's decision-making is based on potential gains and losses rather than on final outcomes.

Likewise, findings of Urquhart and Hudson (2016), showed that equity market returns were negative one day after the bombings in London whereas returns were positive one day after the bombings at distant places outside the London. They also referred it to the local bias hypothesis in that investors were sensitive towards London bombing only and thus paid more attention towards those attacks. By referring to same local bias hypothesis, the findings of this study are also justified in that KSE 100 index returns are responding negatively to the attacks in Karachi and positively to attacks in financial cities and FATA. Moreover, the investors do not respond to the attacks at all other places. By referring to local bias hypothesis, this study supports the premise that market response may vary to different locations of terrorism events depending on the sentiment of investors towards these attacks.

However, the Islamic equity market investors do not consider the local bias in response to the terrorism events. Since, Islamic equity market returns are insignificant to the terrorism events in Karachi; therefore, the local bias effect is not supported in the case of Islamic equity market model. The reason might be that Islamic equity market investors attain less diversification benefits as compared to the conventional counterparts due to the investor's shariah based investing. The conventional stock market investors have the option to diversify by also having Islamic equities in their portfolio. For such investors, Islamic financial assets can be a desirable investment option, if they can get a better return or reduce their overall risk (for instance, through diversification) from these investments (Umar, 2017). However, the Islamic equity market investors may not have large investment options by having the option to only invest in Islamic equity, therefore, local bias may not prevail in their case which has showed their irrelevance towards attacks in Karachi.

4.6. Terrorism Events and Stock Market during Different Islamic Calendar Months

Given, the direct impact of terrorism on equity markets, impact of different types and location of terrorism events on equity markets in the previous sections, the following section documented the impact of interaction of terrorism events and Islamic calendar months on the conventional and Islamic equity market returns. Table 12 provides the impact of terrorism events on the conventional and Islamic equity market returns for the event day and for one day after the event. Likewise, Table 13 is used to report the impact of terrorism on the conventional and Islamic equity market returns for two days after the event and three days after the event.

To analyze the impact of terrorism on the equity markets, this study has used the interactive dummies. The interaction of terrorism event dummies with Islamic calendar months dummies were regressed on the conventional and Islamic equity market returns. Based on the findings in the Table 12, it is revealed that during different Islamic calendar months the conventional and Islamic equity market returns vary on the day terrorism event happens. The interaction effect of terrorism on conventional equity market returns are significant on the event day during the months of Sha'aban, Shawwal, Rajab, Rabi' al-thani, Jumada al-awal and Jumada al-thani are significant. Specifically, the market reaction on event day is strongly significant positive to the terrorism events happening during the month of Shawwal at one percent level of significance whereas the market reaction is significant during the months of Sha'aban, Jumada al-awal and Jumada al-thaniat five percent level of significance for conventional equity market. Furthermore, the conventional equity market reaction is weakly significant positive at ten percent level of significance for the months of Rajab and Rabi' al-thani. However, the interaction effect of terrorism events with Islamic calendar months on the conventional equity market returns indicates insignificant market reaction in rest of the months.

Likewise, the interaction effect of terrorism event day with Sha'aban, Shawwal, Rajab, and Jumada al-thani are significant at five percent level of significance for Islamic equity market returns. Furthermore, the interaction effect of Shawwal with terrorism event day on Islamic equity market returns is strongly significant positive at one percent level of significance whereas interaction of Sha'aban, Rajab, and Jumada al-thani with terrorism event day is significant positive at five percent level of significance. Nonetheless, the interaction effect of terrorism events with rest of Islamic calendar months on the Islamic equity market returns indicates insignificant market reaction.

The model 2 in the Table 12 documented the interaction effect of post event day one and Islamic calendar months on the conventional and Islamic equity market returns. The findings indicate that returns become insignificant one day after the terrorism

events implying that impact of terrorism events on conventional and Islamic equity market returns varies during different Islamic calendar months only on the event day whereas market becomes insensitive very next day of event. These findings imply that impact of terrorism events on conventional and Islamic equity market returns becomes irrelevant to the month of occurrence of terrorism events on the days following the event day.

Likewise, Table 13 reports the interaction effect of terrorism events with Islamic calendar months on the conventional and Islamic equity market returns for post event day two and post event day three. Based on the market reaction on two days after terrorism events, the findings indicate that conventional equity market reaction is significant only during the months of Safar, Duh al-Qidah and Rabi' al-thani. However, the interaction effect of terrorism and these months on conventional equity market returns is weakly significant positive at ten percent level of significance which implies that market do not react negatively to the terrorism events on post event day two during these months. However, conventional equity market reaction to terrorism events on post event day two is insignificant for rest of the months.

On contrary, the Islamic equity market reaction to terrorism events is insignificant on post event day two during all Islamic calendar months. It indicates that Islamic equity market response to the terrorism events on post event day two is irrelevant to the Islamic months in which terrorism event happens. Regarding market reaction on post event day three, conventional equity market reactions was weakly significant positive at ten percent level of significance during the month of Jumada al-thani. However, the coefficient value for interaction effect of terrorism events with rest of the Islamic calendar months on the conventional equity market returns is insignificant. It implies that equity market is insensitive to the Islamic calendar months of their occurrence.

On the other side, the Islamic equity market reaction to the terrorism events on post event day three is weakly significant positive for events happening in Safar and Rajab implying that market is insensitive to most of the terrorism events. Regarding the overall results, the findings of Table 12 and 13 indicates that market reactions towards terrorism events vary during different Islamic calendar months on the event day for conventional and Islamic equity returns. Besides, the conventional and Islamic equity markets reactions towards terrorism are also insensitive to some months.

4.6.1. Discussion on Terrorism Events and Stock Market during Different Islamic Calendar Months

This section discusses the findings of this study regarding terrorism events and stock market during different Islamic calendar months. Prior studies have implied that

investor mood varies during different Islamic calendar months (Al-Ississ, 2010; Al-Hajieh et al., 2011; Halari et al., 2015; Shah et al., 2017; Syed & Khan, 2017), therefore, this study also examined the impact of terrorism events happening during different Islamic calendar months on the conventional and Islamic equity returns in order to observe whether the impact of terrorism events on the conventional and Islamic equity returns varies during different Islamic calendar months.

Since, terrorism entails many monetary costs involving human and physical capital of any country (Chesney et al., 2011), therefore, it may also affect the investment decisions in that country (Lenain et al., 2002; Nedelescu & Johnston, 2005). Past studies have documented the impacts of terrorism on the investors' confidence (Drakos, 2010) which thereby affects the equity returns (Brown & Cliff, 2005; Schmeling, 2009; Drakos, 2010). Likewise, investor mood varies depending on different calendar months and individuals experience different mental health during different months (Białkowski et al., 2012; Halari et al., 2015). Individuals sentiments are affected by their mental health which may affect their investment decisions (Becker & Mulligan, 1997; Berkowitz & Qiu, 2006; Edwards, 2010; Bogan & Fertig, 2013).

By keeping in view, the abovementioned arguments, the findings of this study can be seen focusing on the investor's response towards terrorism events during different Islamic calendar months. Overall results of this study indicate that the market reactions towards terrorism events vary during different Islamic calendar months on the event day for conventional and Islamic equity returns. Furthermore, these findings also imply that investor mood varies during different Islamic calendar months; therefore, any negative event happening in different Islamic calendar months are responded differently. Furthermore, the impact of terrorism events diminishes in some Islamic months. It indicates that investor mood in different Islamic month is a factor other than terrorism event which may increase, decreases or neutralize the effect of terrorism events on the equity market returns.

It indicates that findings of this study regarding interaction effect of terrorism events and Islamic calendar months on the conventional and Islamic equity markets provided mixed results. The market response towards terrorism events was negative for some months and positive for other months. It implies that equity market reaction towards terrorism events is mixed depending on the Islamic calendar months in which terrorism event happens. However, the impact was very short lived, and it remained only for one or two days and afterwards market becomes normal.

Thus, this study concludes that interaction effect remains for very short period and market become insensitive to these events on one day, two day and three days after the event during most of the Islamic calendar months. These findings support the efficient market hypothesis in that the interaction effect of terrorism and Islamic

calendar months on conventional and Islamic equity market is short lived. Since, the market becomes irrelevant to the month in which terrorism event happens, therefore, findings are consistent with the concept of market efficiency. Findings also indicate that behavior of conventional and Islamic equity markets towards terrorism events during different Islamic calendar months is alike.

Table 12 Terrorism Events and Stock Market during Islamic Calendar Months using OLS Regression (Event Day/ POS Day1)

	Event Day Effect				**POS Day 1 Effect**			
	Conventional		**Islamic**		**Conventional**		**Islamic**	
Variable	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
Ret_{t-1}	0.098624***	0.032405	-0.044471	0.085092	0.101629***	0.032654	-0.044194	0.082737
Neg_1	0.001058	0.000946	0.001812*	0.001037	0.000955	0.000935	0.00165	0.00105
Neg_2	0.002212**	0.000952	0.001565	0.001021	0.001971**	0.000965	0.001399	0.000987
Neg_3	-0.00009	0.001129	-0.000365	0.001178	-0.000205	0.001145	-0.00039	0.001189
EVENTDAY	-0.003556*	0.002014	-0.004093*	0.002293	0.000301	0.001058	0.000596	0.001098
Pos_1	0.000433	0.001006	0.002294	0.001643	-0.001183	0.002479	-0.00139	0.003048
Pos_2	0.001107	0.000875	-0.000497	0.001508	0.001092	0.000875	-0.000383	0.00145
Pos_3	-0.00049	0.001056	-0.000405	0.000998	-0.000555	0.001093	-0.00044	0.00102
MUH	0.001594**	0.000689	0.001352*	0.000785	0.001629**	0.000685	0.001545	0.00073
SAF	0.000609	0.00062	0.000828	0.000701	0.000307	0.000645	0.000655	0.000863
SHA	0.000533	0.000685	0.001322*	0.00075	0.000574	0.000683	0.001635	0.000794
SHW	-0.000104	0.000952	-0.000002	0.00099	-0.000228	0.000932	-0.00007	0.000967
RA	0.001396*	0.000756	0.001902*	0.001045	0.001515**	0.000746	0.00211	0.00099
RAJ	0.001099	0.000726	0.000973	0.000774	0.001384*	0.00074	0.001308	0.00077

RAM	0.000911	0.000975	0.001491	0.001009	0.001054	0.000979	0.001479	0.001003
DQ	0.00026	0.000858	0.000281	0.000969	-0.000224	0.000875	-0.000196	0.001006
RTH	0.00006	0.000759	0.000305	0.00077	0.000202	0.000761	0.000382	0.000893
JA	0.000228	0.00074	0.00094	0.000757	0.000427	0.000744	0.001126	0.00097
JTH	0.000797	0.000968	0.000507	0.001936	0.001194	0.00096	0.000107	0.001269
MUH * Day Dummy	0.00435	0.003399	0.006372	0.003872	0.00189	0.004037	0.001948	0.004236
SAF * Day Dummy	-0.001233	0.004765	-0.00107	0.005468	0.00321	0.003455	0.001786	0.003786
SHA * Day Dummy	0.006891**	0.003346	0.00946**	0.004452	0.004358	0.003732	0.002974	0.004396
SHW * Day Dummy	0.009348***	0.003145	0.009811***	0.003739	0.008407	0.005236	0.009037	0.005292
RA * Day Dummy	0.00326	0.002687	0.00334	0.00306	0.00004	0.003328	0.000096	0.003915
RAJ * Day Dummy	0.007724*	0.004381	0.0092**	0.004413	-0.000468	0.003411	0.00097	0.00417
RAM * Day Dummy	0.003663	0.005226	0.002837	0.005585	-0.001431	0.005319	0.001973	0.005768
DQ * Day Dummy	-0.005318	0.005562	-0.00312	0.005492	0.002789	0.005778	0.005971	0.005938
RTH * Day Dummy	0.005331*	0.003195	0.004399	0.003561	0.001527	0.003526	0.002562	0.004192
JA * Day Dummy	0.01139**	0.005365	0.010595	0.006777	-0.004969	0.003356	-0.003771	0.003405
JTH * Day Dummy	0.006965**	0.003115	0.008888**	0.003511	-0.002966	0.004229	0.016384	0.017073
Durbin Watson test	1.999129		2.001964		2.000781		1.985692	

Breusch–Pagan test	.000	.000	.000	.000
Serial Correlation LM Test prob.	1	0.6677	1	0.0025

*Note: C indicates the intercept term for the equation, Note: Ret_{t-1} indicate one period lagged return, Neg_1 is a dummy variable used to indicate one day before the event day, Neg_2 is a dummy variable used to indicate two days before the event day, Neg_3 is a dummy variable used to indicate three days before the event day, Event day is a dummy variable used to indicate the day event happened, Pos_1 is a dummy variable used to indicates one day after the event, Pos_2 is a dummy variable used to indicates two days after the event, Pos_3 is a dummy variable used to indicates three days after the event and *,**,*** indicates ten percent, five percent and one percent level of significance, MUH is a dummy variable which takes value of 1 for month of Muḥarram zero otherwise, SAF is a dummy variable which takes value of 1 for month of Safar zero otherwise, SHA is a dummy variable which takes value of 1 for month of Sha'aban zero otherwise, SHW is a dummy variable which takes value of 1 for month of Shawwal zero otherwise, RA is a dummy variable which takes value of 1 for month of Rabi' al-awal zero otherwise, RAJ is a dummy variable which takes value of 1 for month of Rajab zero otherwise, RAM is a dummy variable which takes value of 1 for month of Ramaḍan zero otherwise, DQ is a dummy variable which takes value of 1 for month of Duh al-Qidah zero otherwise, RTH is a dummy variable which takes value of 1 for month of Rabi' al-thani zero otherwise, JA is a dummy variable which takes value of 1 for month of Jumada al-awal zero otherwise, JTH is a dummy variable which takes value of 1 for month of Jumada al-thani zero otherwise, Day dummy indicates four dummy variables for event day, post day one, post day two and post day 3. Day dummy for event day takes value of 1 event day zero otherwise, Day dummy for post day event one takes value of 1 for one day after the event zero otherwise, Day dummy for post day event two takes value of 1 for one day after the event zero otherwise, Day dummy for post day event three takes value of 1 for one day after the event zero otherwise and *,**,*** indicates ten percent, five percent and one percent level of significance, To deal with the collinearity issue due to dummy variable trap, (m-1) dummies were used for the Islamic months where Duh al-Ḥijjah was taken as reference category.*

Source: Author's Own Processing.

Table 13 Terrorism Events and Stock Market during Islamic Calendar Months using OLS Regression (POS Day 2/ POS Day3*)*

	POS Day 2 Effect				POS Day 3 Effect			
	Conventional		Islamic		Conventional		Islamic	
Variable	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**	**Coefficient**	**SE**
Ret_{t-1}	0.102389***	0.032575	-0.035703	0.077959	0.103873***	0.032716	-0.039221	0.085328
Neg_1	0.000946	0.00094	0.001518	0.001024	0.000897	0.00094	0.001553	0.001029
Neg_2	0.002195**	0.000953	0.001472	0.001018	0.002298**	0.000954	0.001621	0.001024
Neg_3	-0.00028	0.001132	-0.000569	0.001184	-0.00010	0.001141	-0.000337	0.001195
EVENT DAY	0.000232	0.001052	0.000423	0.001154	0.000176	0.001031	0.000291	0.001155
Pos_1	0.000329	0.000996	0.00198	0.001621	0.00029	0.000997	0.002044	0.001636
Pos_2	-0.003315	0.00279	-0.002462	0.003049	0.001084	0.000874	-0.000494	0.001512
Pos_3	-0.000461	0.001101	-0.000504	0.001007	-0.000445	0.002846	-0.000781	0.002633
MUH	0.001641**	0.00069	0.001419*	0.000784	0.001592	0.000691**	0.001355*	0.000787
SAF	0.000344	0.000645	0.000502	0.000724	0.000269	0.000637	0.000431	0.000719
SHA	0.000679	0.000683	0.001538**	0.000753	0.000863	0.000673	0.001718*	0.000753
SHW	0.00029	0.00096	0.000225	0.001	0.000039	0.000949	0.000079	0.00099
RA	0.001465*	0.000767	0.001722*	0.001032	0.001479	0.000719**	0.002119**	0.00102
RAJ	0.001289*	0.000742	0.001146	0.000784	0.001477	0.000739**	0.001455*	0.000786
RAM	0.000733	0.000955	0.001292	0.000995	0.000936	0.000982	0.001407	0.001018
DQ	-0.000344	0.000886	-0.000221	0.000974	0.000002	0.000862	0.000026	0.000978
RTH	0.000103	0.000765	0.000226	0.000773	0.00023	0.000767	0.000376	0.000781

JA	0.000356	0.000 75	0.00106 6	0.000 764	0.000241	0.00074	0.00094 7	0.000 76
JTH	0.001046	0.000 973	0.00164 1	0.001 772	0.000593	0.00095 5	0.00046 6	0.001 896
MUH * Day Dummy	0.004371	0.004 046	0.00321 5	0.004 2	0.000615	0.00393 1	0.00236	0.004 05
SAF * Day Dummy	0.005474 *	0.003 077	0.00451 7	0.003 422	0.004234	0.00347 2	0.00634 7*	0.003 456
SHA * Day Dummy	0.005255	0.004 085	0.00387 7	0.004 387	-0.00276	0.00450 9	-0.00153	0.004 412
SHW * Day Dummy	0.002177	0.004 284	0.00244 6	0.004 319	0.001218	0.00486 3	0.00248 1	0.004 699
RA * Day Dummy	0.003497	0.003 197	0.00345 5	0.003 723	-0.001375	0.00428 9	-0.00294	0.003 902
RAJ * Day Dummy	0.004352	0.003 687	0.00346 9	0.003 966	-0.005303	0.00336 1	-0.00626 *	0.003 419
RAM * Day Dummy	0.010055	0.008 033	0.00631 8	0.007 464	-0.000895	0.00353	0.00081 1	0.003 44
DQ * Day Dummy	0.008306 *	0.004 317	0.00569 2	0.005 909	-0.005783	0.00761 8	-0.0028	0.005 018
RTH * Day Dummy	0.005819 *	0.003 359	0.00405 4	0.003 543	-0.000778	0.00324 6	-0.00034	0.003 003
JA * Day Dummy	0.003397	0.003 557	0.00008 1	0.003 603	0.004509	0.00661 4	0.00423 8	0.005 592
JTH * Day Dummy	0.002807	0.003 611	-0.01607 2	0.015 813	0.007544 *	0.00437 5	0.00608 8	0.004 106
Durbin Watson test	1.999818		1.99294		2.005903		2.004417	
Breusch–Pagan test prob	.000		.000		.000		.000	
Serial Correlation LM Test	1		0.1975		0.3164		0.22	

Note: C indicates the intercept term for the equation, Note: Ret_{t-1} indicate one period lagged return, Neg_1 is a dummy variable used to indicate one day before the event day, Neg_2 is a

*dummy variable used to indicate two days before the event day, Neg_3 is a dummy variable used to indicate three days before the event day, Event day is a dummy variable used to indicate the day event happened, Pos_1 is a dummy variable used to indicates one day after the event, Pos_2 is a dummy variable used to indicates two days after the event, Pos_3 is a dummy variable used to indicates three days after the event and *,**,*** indicates ten percent, five percent and one percent level of significance, MUH is a dummy variable which takes value of 1 for month of Muḥarram zero otherwise, SAF is a dummy variable which takes value of 1 for month of Safar zero otherwise, SHA is a dummy variable which takes value of 1 for month of Sha'aban zero otherwise, SHW is a dummy variable which takes value of 1 for month of Shawwal zero otherwise, RA is a dummy variable which takes value of 1 for month of Rabi' al-awal zero otherwise, RAJ is a dummy variable which takes value of 1 for month of Rajab zero otherwise, RAM is a dummy variable which takes value of 1 for month of Ramaḍan zero otherwise, DQ is a dummy variable which takes value of 1 for month of Duh al-Qidah zero otherwise, RTH is a dummy variable which takes value of 1 for month of Rabi' al-thani zero otherwise, JA is a dummy variable which takes value of 1 for month of Jumada al-awal zero otherwise, JTH is a dummy variable which takes value of 1 for month of Jumada al-thani zero otherwise, Day dummy indicates four dummy variables for event day, post day one, post day two and post day 3. Day dummy for event day takes value of 1 event day zero otherwise, Day dummy for post day event one takes value of 1 for one day after the event zero otherwise, Day dummy for post day event two takes value of 1 for one day after the event zero otherwise, Day dummy for post day event three takes value of 1 for one day after the event zero otherwise and *,**,*** indicates ten percent, five percent and one percent level of significance, To deal with the collinearity issue due to dummy variable trap, (m-1) dummies were used for the Islamic months where Duh al-Ḥijjah was taken as reference category.*

Source: Author's Own Processing.

5. Conclusions

The risk arising from terrorism varies from other sources of risk in variety of ways hence calls for more investigation. For instances, terrorism may cause death of large number of people whereas, this number might be lower in other incidents. Moreover, these events also differ to other events in that these events create fear at broader level, terrorism causing threat to national security and failure to recover and prevention measures as disgrace to country (Viscusi, 2009).

Furthermore, this study is the pioneer in highlighting the conventional and Islamic equity market reaction towards the terrorism events based on the event type and location. Previous studies have examined the impact of terrorism events on the equity returns based on the event type and event location (Eldor & Melnick, 2004; Aslam & Kang, 2013; Aslam et al., 2015). However, the impact of terrorism events on the Islamic equity market returns was unheeded. Hence, this study documented the impact of terrorism on Islamic equity market returns as well. Moreover, up to the

knowledge of researchers, this study is the first to document the interaction effect of terrorism with Islamic calendar months on the conventional and Islamic equity market returns. The current research has significant implications for stockholders and portfolio managers in the stock markets. Previous studies indicate that investors are influenced by the emotions and sentiments, therefore, their investment decisions are directed by their moods resulting in irrational investing. The current study has revealed how investors behave in response to the terrorism events. Furthermore, it also shows the behavior of conventional and Islamic equity market investor in response to the terrorism events based on the event types and location. Moreover, it may help the stockholders and portfolio managers to understand the investors' behavior towards terrorism events happening during different Islamic calendar months.

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Author Contributions
HI and HMT conceived the study and were responsible for the design and development of the data analysis, literature review and write up. HH provided support in data collection and analysis. RYH provided support in organization of study and proofreading of the draft.

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Notes:

[1] According to Al-Ississ (2015), during Muharram, there are significant negative returns which are associated to bad/negative mood of investors. However, this finding is depending to the proportion of Shia (Shia is one of the branch in Islam whereby another branch is known as Sunni) in a country. From the Shia perspective, Muharram is a month of mourning due to the death of Prophet Muhammad's grandson, Hussein ibn Ali, who was killed in the Battle of Karbala. The commemoration of the mourning event starts from the first of Muharram to twentieth of Safar, which is the Ashura day. The current population in Pakistan is estimated around 196 million and, there is approximately 16 to 30 million people of Shia population in Pakistan.