THE IMPACT OF TERRORISM ON FINANCIAL MARKETS: EVIDENCE FROM ASIA

Faheem Aslam*
Department of Finance
Hanyang University Business School
222 Wangsimni-ro, Seongdong-gu
Seoul, Korea, 133-791
tel: +82.2.3148-0253
email: fahimparacha@gmail.com

Hyoung-Goo Kang
Department of Finance
Hanyang University Business School
222 Wangsimni-ro, Seongdong-gu
Seoul, Korea, 133-791
tel: +82.2.2220-2883, fax:+82.2.2220-0249
email: hyoungkang@hanyang.ac.kr

Abstract
This article uses the daily data from five Asian equity markets to analyze the effects of terrorist events on stock markets. The data distinguishes attack type, target type, weapon type and severity of the attack for 410 terrorist events between 1997 and 2011. An event-study analysis uncovers evidence of a varying impact of the terrorist events on Asian stock markets. Our empirical findings show that Dhaka and Colombo stock exchange recovers from such terror shocks in two days, Jakarta and Philippine stock exchange recovers in one day, while there is no significant effect on Bombay stock exchange. The results show that terrorist events targeting the business sector and security forces are particularly destructive for the stock markets. Terrorist attacks in the form of suicide squad and bomb blast generates a significant downward movement in the stock markets. Furthermore, the more severe terrorist events in terms of deaths and injuries have larger negative impact on market returns.

Keywords*: Asian Equity Markets, Terrorism, Geopolitical Risk, Event Study, Stock Market

JEL Codes: G10, G14

Correspondence concerning this article should be addressed to Faheem Aslam. Email: fahimparacha@gmail.com

1. INTRODUCTION

Terrorism is considered as the greatest safety threat to the world, and the extent has increased significantly over the last decade. There are innumerable terrorist events that create fear, vulnerability, uncertainty, panic and insecurity in the society. The effects of ongoing terrorism on financial markets have become heightened, after the 9/11 terrorist attacks. Lenain et al. (2002) reported that the New York Stock Exchange (NYSE) closed all trading until 17 September and the DJIA declined 14 percent in the intervening week. Karolyi and Martel (2010) found a significant negative stock price reaction of -0.83%, per firm per attack. The threats of terrorism decrease the foreign direct investment and trade by increasing the risks of conducting business in foreign countries, increasing the security consideration and increasing the transportation costs (Jain and Grosse, 2009). We contribute the existing literature by analyzing the impact of 410 terrorist events in five most effected Asian countries. We found that the terrorist events have varying effects on Asian stock market.

There have been several studies to explain the impacts of terrorism on economic performance (Abadie and Gardeazabal, 2008; Gaibulloev and Sandler, 2009; Buesa et al., 2007). A growing body of literature has focused on the impact of terrorism on financial markets. Several studies found a negative impact on stock market returns (Aslam and Kang, 2013; Kollias et al., 2011; Drakos, 2010; Eldor and Melnick 2004). Similarly, there is an agreement that terrorism significantly decreases the stock market returns and makes them volatile (Essaddam and Karagianis, 2014; Barros and Gil-Alana, 2009; Nguyen and Enomoto, 2009; Arin et al., 2008; Nikkinen et al., 2008). The terrorist events adversely affect the working environment of business sector environment (Larobina and Pate, 2009; Blomberg et al.; Frey, 2009). However, the existing research has predominantly focused on financial markets of US, Israel and Europe.

Furthermore, most of the studies focused on limited number of terrorist events and particularly the terrorist event of 9/11. The impact of terrorism on financial markets has not been straightforward or consistent. Therefore, it is vital to analyze the effects of terrorism financial markets for better understanding and international evidence across countries. Statistical evidence to understand the tactics of terrorists and its impact on financial markets is fundamental for investors, executives, traders, and policy makers to minimize the effects of such shocks on financial markets.

Our study is unique from prior research and make a fivefold contribution to the existing literature. Unlike previous research, we use high frequency daily data to analyze the impact of terrorist events, on five Asian stock markets over a period of 15 years i.e. 1997-2011. First, this study captures the impact of 410 relatively major terrorist events on stock market returns, over five-day event windows surround the events [-2, -1, 0, +1, +2]. Second, the impact is analyzed with respect to five distinct attack types namely Armed Assault, Assassination, Bombing/Explosion, Facility/Infrastruct (Facility/Infrastructure Attack) and Suicide. Third, we analyze the impact of terrorist events by dividing them into six main targets of Business, Government, Pvt. Cit. & Prop. (Private Citizens & Property), Rel. Fig./Ins. (Religious Figures/Institutions), Security Forces and Transportation. Fourth, we estimate the impact of different weapons used in terrorist events by dividing them into four categories of Explosive/Dynamite, Firearms, Incendiary and Melee. Fifth, we analyze the effects of the severity of the terrorist events in term of number of deaths and number of injuries caused by the attacks. (See Appendix 1 for the detail of all the variables used in this study).

The main findings includes, the terrorist events have short-term negative, but varying effects across Asian stock market. The terrorist events have significant negative impact on returns of

Dhaka stock exchange (DSE), Jakarta stock exchange (JKSE), Colombo stock exchange (CSE) and Philippine stock exchange (PSE), on the day of event (T=0). The terrorist events in Bangladesh and Sri Lanka have significant negative impact on DSE and CSE indices, one day after the event (T=+1). This result indicates that Suicide and Bombing/Explosion attacks are particularly devastating to Asian stock market. The Terrorist events targeting the business sector and security forces have significant negative impact on the performance of Asian stock market. Our empirical findings show that Explosive/Dynamite weapons are particularly destructive to Asian stock market, while terrorist activities using other weapons are not significantly important. The more severe the terrorist attack event (i.e. more deaths and injuries) is; the greater is the negative impact on stock market return. Such findings can be useful in different areas of business, economic and financial theory and practice, such as risk management, portfolio development and insurance planning etc. In the light of these findings, the timely response of business firms can be helpful to minimize the adverse effects of such events on business environment. The Government and other regulators can formulate the policies to strengthen the financial markets. Furthermore, an anti-terrorism policy can be formulated to abate the long-term disorders in the environment. These findings may also provide help to investors to diversify their portfolios across countries.

2. LITERATURE REVIEW

The world has witnessed a surge of terrorism over the past decade. Terrorism is one of the main international security threat today. Particularly, after the terrorist attacks of 9/11, several studies take up the issue of economic effects of terrorism with more detail. However, the literature about the impact of terrorist events on the performance of stock markets is still at developing stage. Karolyi (2006) concluded that there is yet little known about the financial consequences of the

terrorism. Most of the research focused on limited number of terrorist events in developed countries only. Recently, the focus is getting broader and few studies focused on series of terrorist events over time, for countries other the U.S. To the best of our knowledge, our study is the first to analyze the effects of wide range of terrorist events with respect to event day, attack type, target type, weapon type and the severity of terrorist event on Asian stock markets.

Several research studies analyzed the impact of terrorist events on the health of economy. For example, Abadie and Gardeazabal (2008), Gaibulloev and Sandler (2009) and Buesa et al. (2007), found a negative impact of terrorism on economic growth. A growing body of literature has focused on the possible effects of terrorist events on financial markets, both in terms of returns and volatility. For instance, Essaddam and Karagianis (2014), Eldor and Melnick (2004), Zussman and Zussman (2006), Drakos (2010), Karolyi and Martell (2010), Eldor et al. (2012) and Aslam and Kang (2013) found a negative impact of terrorism on stock market returns. Relatedly, several studies focused on both financial market returns and volatility simultaneously. For example, Arin et al. (2008), Aslam, Eom and Kang (2014), Barros and Gil-Alana (2009), Nikkinen et al. (2008), Nguyen and Enomoto (2009), Bautista (2003) and Fernandez (2007) found that terrorist events have negative impact on stock market returns and make them volatile. The studies of Kollias *et al.* (2011) and Berrebi and Klor (2005) found that terrorism have varying effect on different stock market. However, Coleman (2012), Christofis et al. (2013), Chen and Siems (2004) and Peleg et al. (2011) argued that financial markets are efficient, and absorb the effects very quickly. Relatedly, Johnston and Nedelescu (2006) concluded that response of the authorities is crucial to make the financial markets efficient, to absorb the impact of terrorism. On the other hand, Blomberg et al. (2009), Jain and Grosse (2009), Larobina and Pate (2009) and Frey (2009) estimated the effects of terrorism on the business sector and found

that such events increase the business risk and endure additional costs.

Several studies assessed the influence of terrorism on economic conditions. For instance, Abadie and Gardeazabal (2008) found that even terrorism represents a small fraction of the overall economic risk; it has a large impact on the allocation of productive capital across countries. Terrorism increase the uncertainty and reduces the expected return to investment. The changes in the intensity of terrorist events may cause significant movements of capital across countries, if international investors are able to diversify other types of country risks. Similarly, Gaibulloev and Sandler (2009) found that, on average, every additional terrorist event per million persons decreased the gross domestic product (GDP) per capita growth by 1.5% in a given year. Relatedly, Buesa et al. (2007) attempted to measure the direct economic costs of the Madrid terrorist event on March 11, 2004. The authors found that these terrorist events caused a minimum loss of 0.16% of the GIP of the Madrid Region o and 0.03% of the Spain national GDP. This loss is equivalent to € 211.584 million. In addition to huge economic loss, Madrid terrorist events caused 291 deaths and 1600 major injuries.

A number of studies used wide range of terrorist events and agreed on negative impacts of terrorism on stock market returns. For instance, Karolyi and Martell (2010) found that the terrorist events have a significant negative effect of 0.83 percent on stock prices, equivalent to an average loss of $401 million market capitalization per firm per attack. Likewise, Eldor and Melnick (2004) examines the impact of 639 terrorist events on Israel's stock market prices and exchange rates. They found that suicide attacks had a permanent effect on financial markets. The location of the event is not important and the financial markets is able to recover quickly. The impact varies with the role of seniority and wing membership. The stock market decline following the assassinations targeting the senior political leaders, while rises following the

assassinations of senior military leaders. In a similar study, Aslam and Kang (2013) used event study methodology to estimate the impact of 300 terrorist events on Karachi stock market over a period of twelve year. The authors found a significant negative impact of terrorism on KSE-100 index returns. They also found that the impact varies with respect to location, and severity of the terrorist events. The more intense the terror attack is (more people killed or suicide event), the larger is the negative impact on stock market (Eldor et al., 2012).

Several studies focus on the impacts of terrorism on stock market returns and volatility simultaneously. Most of the studies found that terrorist events have negative impact on stock market return and make them volatile. For instance, Nikkinen *et al*. (2008) used data from 53 equity markets found that terrorist event of 9/11 have short-run negative impact on stock returns and significantly increase the volatility across regions. However, stock markets were able to absorb the effects and recovered quickly. The impact of terrorist events on financial markets also varies from market to market across countries. Relatedly, Arin et al. (2008) investigated the effects of terrorist events on return and volatility of six different financial markets. They found that terrorism has significant effect on both stock market return and volatility, in all six countries. However, the impact is larger in emerging markets, while the European stock markets (Spain and UK) were less effected. The Iraq war and terrorist incidents in Indonesia, Madrid, and London negatively affect the stock market returns and make them volatile (Nguyen and Enomoto, 2009). A few studies compare the impact on different countries and found a varying effect across countries. For example, Kollias *et al*. (2011) examined the impact of bomb blasts in Madrid and London, on stock markets of UK and Spain. They found a significant negative impact on Spanish stock markets only, while the London stock exchange absorb the effects in one day. Similarly, terrorist events have a significant positive impact on security of Israeli companies, while a

7

negative effect Israeli companies (Berrebi and Klor, 2005).

Although most of the studies found a negative impact on stock market performance, a few have conflicting findings. For instance, Chen and Siems (2004) used the event study methodology to estimate the impact of 14 major terrorist events on U.S. capital market. They found that U.S. capital markets are more flexible, more resilient, and more flexible to recover quickly than other financial markets of the world. They also found that the impact of the 9/11 events was less severe than the terrorist events in past. Similarly, Peleg et al. (2011) examined the impact of 90 terrorist events on Israeli Tel Aviv stock market TA-100 Index over the period of six years. The authors found that Tel Aviv stock market influenced by both the severity and intensity of suicide bombings. However, the impact is short-term and a 'normalization of terror' is likely to occur. A recent study of Christofis et al. (2013) examined the impact of three major terrorist events on the Istanbul Stock Exchange. The authors found that that the impact of these events is significant but short-lived and the market recover quickly. However, these events have adverse effects on tourism industry. The comprehensive study of Johnston and Nedelescu (2006) analyzed the reaction of global financial markets to terrorist events. The author found that financial markets are efficient in absorbing the shocks of terrorist event and they remain functional. The precise, flexible and timely response of the regulatory authorities is crucial to make the financial markets efficient and more resilient against terrorist events.

3. DATA DESCRIPTION AND ECONOMETRIC METHODOLOGY

3.1 Data Description

For the purposes of this research, two types of data sets were used. The first data set includes daily prices of five Asian market indices and the second data set includes news on domestic terrorist events of respective countries. We selected five Asian countries, not only having a

developed stock market but also highest number of relatively severe terrorist events, causing largest number of people killed and injured. The five selected countries include Bangladesh, India, Indonesia, Philippine and Sri Lanka, based on these two criteria. The excluded countries either did not have a develop stock market or had very small number of severe terrorist attacks. For example, in Afghanistan, there are larger number of severe terrorist incidents, but there is no stock market. Similarly, the countries as Japan, china etc. have developed markets, however there are very few terrorist incidents. Therefore, we analyze the impact of large number of terrorist events on these five most effected countries in the Asian region.

The data include the characteristics of 410 terrorist events that took place in selected five Asian countries from January 1997 to December 2011. The daily closing prices of indices collected from yahoo finance (http://finance.yahoo.com/) and websites of the respective stock exchanges. We collected the event date, attack type, target types, weapon types and human loss (deaths plus injuries) from Global Terrorism Database (http://www.start.umd.edu/gtd/). Since a very large number of terrorist attacks took place in Asia, we choose 410 relatively major terrorist attacks based on number of deaths and injuries. If the stock market was close on event day, we consider its effect on next working day. Furthermore, if more than one terrorist event took place on the same day, the events were consider as a single event.

There is a surge of both domestic and international terrorism in Asia. Particularly, domestic terrorism in Asian counties has become very destructive phenomenon. Table 1 shows the country wise frequency distribution of 410 relatively major events that took place in five Asian countries, from year 1997 to year 2011.

******* Table 1 *******

We report that 101 relatively major terrorist events took place in India causing 2405 deaths and

3332 injuries. Similarly, in Sri Lanka, 2620 people killed and 4000 injured in 90 major terrorist events. In Bangladesh 81 major terrorist events, caused 246 deaths and 1431 injuries followed by Philippine, where 74 major terrorist events caused 950 deaths and 1408 injuries. Relatively less number of terrorist events were in Indonesia, where 64 terrorist events caused 360 deaths and 838 injuries. The "figure 1" depict the country wise number of terrorist incidents and human loss caused by them, from year 1997 to 2011.

******* Figure 1 *******

For in depth analysis, the terrorist events were distinguished with respect to attack type, target type and weapon type. In attack type, 162 Armed Assault, 136 Bombing/Explosion, 61 Suicide, 27 Assassination and 24 Facility/Infrastructure Attacks took place from 1997 to 2011. Similarly, in target type, 130 on Security Forces, 96 on Private Citizens & Property, 69 on Business, 50 on Government and 26 terrorist events targets the Religious Figures/Institutions. The most common weapon used in these events is Explosive/Dynamite (192), Firearms (152), while Incendiary (36) and Melee (30) were relatively less used weapons.

3.2 Econometric Methodology

The daily logarithmic daily percentage index returns ($R_{i,t}$) is calculated by using the "equation (1)", where (i) and (t) denote the country and day, respectively.

$$R_{i,t} = ln(I_{i,t} / I_{i,t-1}) \tag{1}$$

Where $R_{i,t}$ is the return on the index for period t, $I_{i,t}$ is the value of index at the end of period t, and $I_{i,t-1}$ is the value of the index at the end of period $t-1$.

For the purposes of this research, terrorist event (*TERRi,t*) is defined as "threatened or actual use of illegal force and violence to attain a political, economic, religious or social goal through fear, coercion or intimidation" (Global Terrorism Database). We used event study methodology to

estimate the impact of terrorist events on stock market. The terror dummy variables constructed from an observed terrorist event across countries and time as follows:

$$TERR_{i,t} = \begin{cases} 1, \text{if a terrorist event took place in country } i \text{ at time } t \\ 0, \text{otherwise} \end{cases} \quad (2)$$

Based on the "Equation (2)", we construct the binary series of terrorist events. We analyze the impact of terrorist attacks with respect to days around the event, target type, attack type, weapon type and human loss in any attack. For in-depth analysis, we define the following five groups of dichotomous variables to estimate the impact of different terrorist's tactics. A brief discussion of the methodology is given below.

3.2.1 Impact of Terrorism around the Event Day

First, we defined the following five dichotomous day's dummy variables, to capture the impact over five-day event windows surround the events.

$$DAY_{i,t} = \begin{cases} 1, \text{if the date is } i \text{ day from the terrorist event} \\ 0, \text{otherwise} \end{cases} \quad (3)$$

Where i = -2, -1, 0, +1, +2 and "0" is the event day.

We use the dummy variable regression approach, where the dependent variable is the index return of and independent variables are five defined days' dummy variables. All five days' dummy variables are regressed by examining the individual day index returns around the terrorist event, in the same regression model, separately for each country. The relationship is postulated in the "Equation (4)".

$$R_{i,t} = \alpha + \sum_{d=-2}^{2} \beta_i DAY_{i,t} + \varepsilon_i \quad (4)$$

Where, α, β are parameters to be estimated, ε_i is random error.

3.2.2 Impact of Terrorism With Respect To Attack Type

Second, the terrorist events divided into five types, namely Armed Assault, Assassination,

Bombing/Explosion, Facility/Infrastruct (Facility/Infrastructure Attack) and Suicide. We defined following five dichotomous dummy variables by using the 'Equation (5)'.

$$TYPE_{i,t} = \begin{cases} 1, \text{if the terrorist attack type is } i \\ 0, \text{otherwise} \end{cases} \qquad (5)$$

Where, i=Armed Assault, Assassination, Bombing/Explosion, Facility/Infrastruct (Facility/Infrastructure Attack), Suicide.

After defining the attack type dummy variables, the 'Equation (6)' is used for the estimation of terrorist events with respect to six types of attack on market returns.

$$R_{i,t} = \alpha + \sum_{d=1}^{5} \beta_i TYPE_{i,t} + \varepsilon_i \qquad (6)$$

3.2.3   Impact of Terrorism With Respect To Target Type

Third, terrorist events divided into six main categories with respect to the target of the attack. The distinct categories includes Business, Government, Pvt. Cit. & Prop. (Private Citizens & Property), Rel. Fig./Ins. (Religious Figures/Institutions), Security Forces and Transportation. Following six dichotomous dummy variables are defined by using the following equation.

$$TGT_{i,t} = \begin{cases} 1, \text{if the target of terrorist event is } i \\ 0, \text{otherwise} \end{cases} \qquad (7)$$

Where i = Business, Government, Pvt. Cit. & Prop. (Private Citizens & Property), Rel. Fig./Ins. (Religious Figures/Institutions), Security Forces and Transportation. The following dummy variable regression is used to estimate the impact of terrorist events with respect to target type on indices' returns.

$$R_{i,t} = \alpha + \sum_{d=1}^{6} \beta_i TGT_{i,t} + \varepsilon_i \qquad (8)$$

3.2.4 Impact of Terrorism With Respect To Weapon Type

Fourth, the terrorist events are divided into four weapon types used in the attacks. The four main weapons used in Asian countries includes Firearms, Explosive/Dynamite, Incendiary and Melee. Following four dichotomous dummy variables are defined to capture the impact of terrorist events with respect to the weapon used in the attack.

$$WPN_{i,t} = \begin{cases} 1, \text{if the weapon used in the terrorist event is } i \\ 0, \text{otherwise} \end{cases} \tag{9}$$

The 'Equation (10)' is used for the estimation of terrorist events with respect to weapon used in the terrorist activities.

$$R_{i,t} = \alpha + \sum_{d=1}^{4} \beta_i WPN_{i,t} + \varepsilon_i \tag{10}$$

3.2.5 Impact of Terrorism With Respect To Severity

Finally, we analyze the impact of human loss (deaths plus injuries) in a terrorist attack on the performance of stock market indices by using multiple regression. The dependent variable is indices' return and the independent variable are number of people killed and number of injuries in a terrorist event, separately for each county. The relationship between index return and Human loss is postulated as a linear model in "equation 11".

$$R_{i,t} = \alpha + \beta_1 (Deaths) + \beta_2 (Injuries) + \varepsilon_i \tag{11}$$

Where;

Deaths = number of people killed in a terrorist event

Injuries = number of people injured in a terrorist event

4. EMPIRICAL FINDINGS

4.1 Impact of Terrorism around the Event Day

In this section, there will be an examination of the reaction of five stock markets to the terrorist

events over five-day windows surround the events [-2, -1, 0, +1, +2]. In Table 2, we report the impact of 410 terrorist events on five stock markets indices around the events.

******* Table 2 *******

We perform the robustness check for the autocorrelation and heteroscedasticity. The estimated values of Durbin-Watson Statistic range from 1.62 to 1.87 in five models. This DW values indicates that there is no autocorrelation in the error terms. Similarly, all the values of F-statistic are significant in Breusch–Pagan test, which confirms the absence of heteroscedasticity. Our empirical findings show that terrorist events have significant negative effect on Asian stock market's returns, except Bombay stock exchange. The terrorist events attacks have a significant negative impact on the performance of DSE, JKSE, CSE and PSE, on the on the day of event (T=0). However, there is no effect on Bombay stock exchange of India on the day of event. Bombay stock exchange of India is the only market that shows resilient against the terrorist events. The terrorist events in Bangladesh and Sri Lanka have significant negative impact on DSE and CSE indices, one day after the event (T=+1). However, other markets recovers from such shocks in one day, as we did not found any significant effect, one day after the event (T=+1). Furthermore, all Asian markets have no significant impact after two days of the event and absorb the impact of terrorist events (T=+2). The coefficient for Jakarta stock exchange (β=-0.0067) indicates that every additional terrorist event in Indonesia is associated with a return of -0.67 percent on the day of the attack (T=0), significant at the .01 level. Similarly, on the day of event (T=0), the coefficient of Philippine stock exchange (β=-0.0049) indicates that every additional terrorist attack in Philippine has a negative effect of .49 percent on the returns of PSE-index, significant at .01 level. On event day (T=0), the coefficient for Dhaka stock exchange (β=-0.0046) and Colombo stock exchange (β=-0.0040) indicates that every additional terrorist event

in Bangladesh and Sri Lanka decrease the return of DSEG-index and CSE-index by .46 percent and .40 percent, significant at .01 level, respectively. We did not found any significant impact on Bombay stock exchange of India on event day [T=0]. The Dhaka Stock Exchange and Colombo Stock Exchange are not efficient to recover, even one day after the terrorist event. The terrorist events have significant negative impact on these stock markets, one day after the event. One day after the event (T=+1), the coefficient for Dhaka stock exchange (β=-0.0036) indicates that terrorist events decrease the DSEG-index return by .36 percent, one day after the attack, significant at .05 level. Similarly, one day after the event (T=+1), the coefficient of Colombo stock exchange (β=-0.0033) indicates that terrorist events have a negative impact of .33 percent on CSE-index, one day after the attack, significant at .05 level. However, there is no significant impact of terrorist events before the event day [T=-1,T=-2], and two days after the event [T=+2].

Terrorist events are destructive and affects the financial markets negatively. Reaction to terrorist events is often more emotional. Epstein and Wang (1994) and Mukerji and Tallon (2001) found that due to ambiguity and uncertainty in the financial markets, investors feel reluctance to trade. A specific aim of terrorist's is to create uncertainty and vulnerability in the environment. The investors do not feel secure in such vulnerable environment and shift their business to safer countries. Due to ambiguity, public fear and desire to avoid future loss, the individual investors becomes reluctant to trade, which affect the financial markets negatively (Levy and Galili, 2006). Karolyi (2006) argue that terrorist events have serious implications, because decisions to buy and sell are quickly, easily and inexpensively, be reversed. When information becomes available about a terrorist attack, investors often flee the market in search of safer financial instruments, affecting the market negatively. Furthermore, due to ongoing terrorist events, the companies, government, regulatory authorities and financial institutions may

not have a stable policy. They have to change the policies in response to these unexpected shocks to protect the financial system. Our findings are also consistent with the previous findings, in which stock market returns decreases after terrorist events (Aslam and Kang, 2013; Eldor et al., 2012).

4.2 Impact of Terrorism With Respect To Attack Type

In this section, we examined the effects of five different attack types on the returns of five Asian market indices. Here the independent variables are five distinct dummy variables and the dependent variable is the respective stock market index return. In Table 3, we report the results of five regressions addressing the impact of attack type on five stock market.

<center>******* Table 3 *******</center>

The estimated value of Durbin Watson Statistic range from 1.62 to 1.87, which indicates that there is no statistical evidence of autocorrelation in the error terms. The significant values of F-statistic in Breusch–Pagan test also confirms that there is no evidence of heteroscedasticity. This result indicates that Suicide and Bombing/Explosion attacks are particularly devastating to Asian stock market. The coefficient for Suicide in Bangladesh (β=-0.0170) indicates that every additional Suicide attack in Bangladesh is associated with a return of -1.70 percent on the returns of DSEG-index, significant at .01 level. Similarly, the Suicide coefficient of Philippine (β=-0.0104) and Sri Lanka (β=-0.0057) indicates that every additional Suicide attack has a negative effect of 1.04 percent and .57 percent on the returns of PSE-index and CSE-index, significant at .05 level, respectively. The terrorist events in the form of Bombing/Explosion are also extremely destructive and significantly affect the stock markets in Asia. The Bombing/Explosion coefficient of Indonesia (β=-0.0098) represents that every additional Bombing/Explosion event decrease the returns of JKSE-index by .98 percent, significant at .05 level. Similarly, every

additional Bombing/Explosion event in Philippine (β=-0.0079) is associated with a negative return of .79 percent, significant at .05 level. The Bombing/Explosion event in Bangladesh and Sri Lanka also have significant negative impact on the performance of stock market. Our results show that every additional Bombing/Explosion attack in Bangladesh (β=-0.0063) decrease the returns of DSEG-index by .63 percent, statistically significant at .05 level. We also found that every addition terrorist event in the form of Explosion/Bombing in Sri Lanka (β=-0.0050) have a negative effect of .50 percent on the returns of CSE-index, significant at .05 level. In case of Indonesia, terrorist events in the form of Armed Assault also have significant impact on the performance of stock market. Our result shows that every additional armed assault event (β=-0.0079) have a negative effect of .79 percent on JKSE-index, significant at .05 level. Terrorist events in the form of Assassination and Facility/Infrastruct (Facility/Infrastructure Attack) have non-significant impact on almost all the Asian stock markets.

We can safely concludes that the Suicide attacks and bomb blasts are particularly devastating for business environment, financial markets and economy. Due to upward trend in suicide attacks in the world, the business activities have significantly affected. The suicide attacks are particularly a constant threat to business community. The attacks have troublesome effects on economic, political, and the international relations of target country (Atran, 2004). The suicide attacks have permanent impact on the performance of financial markets (Eldor and Melnick, 2004). Similarly, Bombing/Explosion events are most destructive and cause huge damage both in term of infrastructure and precious human lives. Due to lethal effectiveness and ability to cause more fear, vulnerability and uncertainty, the suicide attacks and explosives had significant impact on the performance of Asian financial markets.

4.3   Impact of Terrorism With Respect To Target Type

In this section, we examined the impact of six target types of terrorist events, on five Asian stock market indices. The dependent variable is the stock markets return and independent variables are six target type dummy variables. Table 4 presents the results of dummy variable regressions addressing the impact of target type on five stock market.

<center>******* Table 4 *******</center>

The estimated value of Durbin Watson Statistics and significant F-statistics in the Breusch–Pagan test confirms that there is no problem of autocorrelation and heteroscedasticity. The Terrorist events targeting the business sector and security forces have significant negative impact on the performance of Asian stock market. Our results show that every additional terrorist attack targeting business sector in Philippine (β=-0.0115) decrease the PSEI returns by 1.15, statistically significant at .01 level. Similarly, the terrorist events targeting business sector in Bangladesh (β=-0.0104) have a negative effect of 1.04 percent on Dhaka stock exchange index, statistically significant at the .01 level. The attacks on business sector in Sri Lanka and Indonesia are also destructive for the stock markets. Our empirical findings show that attacks on business sector in Indonesia (β=-0.0088) decrease the JKSE-index return by .88 percent, significant at .05 level. Every addition attack targeting business sector in Sri Lanka (β=-0.0087) is associated with a return of -0.87 percent on the returns of CSE-index, significant at .05 level. Terrorist events on security forces (military and police), also have significant negative impact on Asian stock market indices. Our results show that terrorist events targeting security forces in Indonesia and Bangladesh have the largest negative impact on stock markets in Asia. Every additional terrorist event targeting security forces in Indonesia (β=-0.0136) is associated with a return of -1.36 percent on the returns of JKSE-index, significant at .01 level. Similarly, attack on security forces

<center>18</center>

of Bangladesh (β=-0.0124) decrease the DSEG-index return by 1.24 percent, significant at .01 level. The attacks targeting security forces in Sri Lanka also have significant negative impact on the performance of CSE-index; however, the magnitude is relatively low. Our results show that every additional every additional terrorist event targeting security forces in Sri Lanka (β=-0.0040) is associated with a return of -0.40 percent on the returns of CS-index, significant at .05 level. We also found that other target types do not have any significant impact on the performance of Asian stock markets.

Based on our empirical findings, we conclude that attacks on business sector and security forces have a negative effect on Asian stock markets; other types of attack do not. Terrorist events targeting business have vast economic and financial implications and ultimately affect the stock markets of the target country. Our findings are in agreement with Larobina and Pate (2009) in which they found a negative impact of terrorism on equity market, aviation, tourism, insurance and corporate society. Similarly, our findings are consistent with Jain and Grosse (2009) in which he argued that terrorism slow down the business process by increasing security concerns, discourage traveling, increase in cost of transportation and increase in international business risks. Relatedly Frey (2009) suggested that the business sector could cope with terrorist events, by decreasing the incentive to attack by decentralizing the business buildings, preparing for quick intervention and rapid reconstruction of physical capital after the terrorist attack. The security forces (Military plus Police) of any country are the backbone and serve as government-sponsored fighting organizations. Terrorist events targeting military, police and intelligence agencies raise serious security concern and shake the investor's confidence, and thus affects the business, financial markets and economy adversely.

4.4   Impact of Terrorism With Respect To Weapon Type

In this section, we examined the impact of terrorist events with respect to four dentist weapon types on five Asian stock market indices. The dependent variable is the stock markets return and independent variables are four distinct weapon type dummy variables. In Table 5, we presents the results of regression addressing the impact of weapon type on stock markets.

<div align="center">******* Table 5 *******</div>

Our empirical findings show that Explosive/Dynamite weapons are particularly destructive to Asian stock market, while terrorist activities using other weapons are not significantly important. Similar to event day analysis, the estimated values of Durbin-Watson Statistic range from 1.62 to 1.87, confirming the absence of autocorrelation in the error terms. The significant values of F-statistic in Breusch–Pagan test confirms the absence of heteroscedasticity. The terrorist events using Explosive/Dynamite weapons in Indonesia have the largest negative effect on the performance of Jakarta stock exchange. The coefficient of Explosive/Dynamite in Indonesia (β=-0.0125) indicates that every additional terrorist event using Explosive/Dynamite in Indonesia is associated with a negative return of 1.25 percent, significant at .01 level. Our results show that every additional terrorist events using Explosive/Dynamite in Bangladesh (β=-0.0068) decrease the DSEG-index return by .68 percent, significant at .01 level. Similarly, Explosive terrorist events in Philippine (β=-0.0066) has a negative impact of .66 percent on the returns of PSE-index, significant at .05 level. We also found a negative effect of terrorist events using Explosive/Dynamite in Sri Lanka by .49 percent (β=-0.0049) on CSE-index, significant at .01 level. The other weapon types have no significant impact on any of the Asian stock markets. Furthermore, we did not found any impact on Bombay stock market of India, regardless of the weapons type. Our findings are consistent with attack type, in which suicide and Bombing/Explosion have significant negative impact on stock market returns. The

Explosive/Dynamite weapons are particularly destructive and cause huge damage that affect the performance of stock markets.

4.5 Impact of Terrorism With Respect To Severity

In this section, we examine the effects of number of deaths and injuries in the terrorist attacks on stock market's returns. The dependent variable is stock market index return and the independent variable are number of deaths and number of injuries in any terrorist event. In Table 6, we reports the regression results.

******* Table 6 *******

The estimated values of Durbin-Watson statistics and F-value in Breusch–Pagan test confirms that there is no issue of autocorrelation and heteroscedasticity, respectively. Overall, the more severe the terrorist attack event (i.e. more deaths and injuries) is, the greater is the negative impact on stock market return. We found an inverse relationship between the number of deaths in a terrorist event and stock market return, keeping the number of wounds held constant. Similarly, in case of Bangladesh and Indonesia, there is negative relationship between the number of wounds in a terrorist event and the stock market retunes. Our results show that every additional death caused by terrorist event in Indonesia (β=-0.0014) decrease the JKSE-index return by .14 percent, significant at .01 level, keeping the number of injuries held constant. Similarly, the coefficient for Deaths in Bangladesh (β=-0.0008) indicates that every additional death in an event is associated with a decrease of .08 percent in DSEG-index, significant at .01 level. We found the same negative relationship between human loss and stock market returns in case of Philippine and Sri Lanka, however the magnitude of the effect is relatively low. We found that every additional death due to terrorist events in Philippine (β=-0.0003) is associated with a negative return on .03 percent, significant at .10 level. Similarly, the coefficients for death

in Sri Lanka, (β=-0.0002) indicates that increase in one death in any terrorist events decrease the CSE-index return by .02 percent, significant at .01 level, by keeping the number of injuries held constant. In case of Bangladesh and Indonesia, the number of injuries also have significant negative impact on stock market returns. The coefficient for Injured in Bangladesh (β=-0.0002) indicates that every additional injury in an event is associated with a decrease of .002 percent in DSEG-index, significant at .01 level, keeping the number of deaths held constant. Similarly, The coefficient for Injured in Indonesia (β=-0.0001) indicates that every additional injury in a terrorist event decrease the JKSE-index return by .001 percent, significant at .05 level. The proportion of number of deaths in Bangladesh and Indonesia is relative small in human loss (deaths plus injured) in the region, and number of injuries have significant impact on stock markets in these two countries. Keeney and Winterfeldt (2010) concluded that the main objectives of terrorists is to kill more people in order to disrupt and destabilize their economies, by installing fear and insecurity in their populations. The findings are also consistent with Peleg et al. (2011) and Aslam and Kang (2013) in which more severe attacks have larger impact on the performance of stock market. Aslam and Kang (2013) argue that more deaths and injuries creates widespread fear and causes uncertainty and vulnerability in the environment and such uncertain conditions affect financial markets negatively.

5. CONCLUSIONS AND RECOMMENDATIONS

Terrorism is considered as the greatest safety threat to the world, and the extent has increased significantly over the last decade. Particularly, domestic terrorism in Asian counties has become the very destructive phenomenon. There were 410 deadly terrorist events caused 6581 deaths and over 11000 injuries in five selected Asian countries. This study estimates the impact of terrorist events on five Asian stock markets by using the five days' event windows surrounding the

terrorist attack. Furthermore, the daily date distinguishes with respect to attack type, target type and weapon type for in depth analysis. Our empirical findings show that the terrorist events have short lived significant negative effect on Asian stock markets. The terrorist events attacks have significant negative impact on the performance of DSE, JKSE, CSE and PSEI on the on the day of event. The terrorist events in Bangladesh and Sri Lanka have significant negative impact on DSE and CSE indices, one day after the event. In attack type analysis, we found that Suicide and Bombing/Explosion attacks are particularly devastating to Asian stock market. The analysis reveals that the terrorist events targeting the business sector and security forces have significant negative impact on the performance of Asian stock market. In weapon type analysis, we found that only Explosive/Dynamite weapons are particularly destructive to Asian stock market. Furthermore, the more severe the terrorist attack event (i.e. more deaths and injuries) is, the greater is the negative impact on stock market return.

One limitation of this study is that we use only terrorist events. The study could be extend by adding the news related to financial, economic and political events. We also focus only on stock markets of Asia. The comparison with other financial markets, like foreign exchange and bond market can be the subject for future research. Despite these limitations, this research study can generate managerial and policy implications in different areas of economics and financial theory, such as risk management, portfolio development, insurance planning and national security. We found that the Asian stock markets absorb the impact of such shocks in one day. In the light of this finding, investors and traders could manage their investment-holding period. Similarly, terrorist events targeting the business sector are particularly destructive for stock markets, so the business firms should take extra measure to protect the business facilities. In the light of these findings, the timely response of business firms can be helpful to minimize the adverse effects of

terrorist events on business environment. The Government and other regulators can formulate the policies to protect the business sectors and to strengthen the financial markets. Furthermore, an anti-terrorism policy can be formulated which particularly focus on the prevention of suicide and explosive bomb blast to abate the long-term disorders in the environment. As we found that severe attacks in term of deaths and injuries have larger negative impact on the financial markets, we suggest that people should avoid large gathering to minimize the terrorist's incentive. These findings may also provide help to investors to diversify and manage their portfolio across countries.

References

Abadie, A. and J. Gardeazabal (2008). Terrorism and the world economy. European Economic Review, 52, pp. 1-27.

Arin, K.P., D. Ciferri, and N. Spagnolo (2008). The price of terror: The effects of terrorism on stock market returns and volatility. Economics Letters, 101, pp. 164-167.

Aslam, F. and H.-G. Kang (2013). HOW DIFFERENT TERRORIST ATTACKS AFFECT STOCK MARKETS. Defence and Peace Economics, pp. 1-15.

Aslam, F., C.Y. Eom, and H.G. Kang (2014). How Terrorist Attacks Affect the Volatility of the Pakistani Stock Market?. Journal of South Asian Studies*, 19*(3), pp. 151-181.

Atran, S. (2004). Mishandling suicide terrorism. The Washington Quarterly, 27, pp. 65-90.

Barros, C.P., G.M. Caporale, and L.A. Gil-Alana (2009). Basque terrorism: police action, political measures and the influence of violence on the stock market in the basque country. Defence and Peace Economics, 20, pp. 287-301.

Bautista, C.C. (2003). Stock market volatility in the Philippines. Applied Economics Letters, 10, pp. 315-318.

Berrebi, C. and E.F. Klor (2010). The Impact of Terrorism on the Defence Industry. Economica, 77, pp. 518-543.

Blomberg, B., G. Hess, and J.H. Jackson (2009). TERRORISM AND THE RETURNS TO OIL. Economics & Politics, 21, pp. 409-432.

Buesa, M., et al. (2007). The Economic Cost of March 11: Measuring the Direct Economic Cost of the Terrorist Attack on March 11, 2004 in Madrid. Terrorism and Political Violence, 19, pp. 489-509.

Chen, A.H. and T.F. Siems (2004). The effects of terrorism on global capital markets. European Journal of Political Economy, 20, pp. 349-366.

Christofis N., C. Kollias, S. Papadamou and A. Stagiannis (2013). ISTANBUL STOCK MARKET'S REACTION TO TERRORIST ATTACKS. Dogus University Journal, 14, pp. 153-164.

Coleman, L. (2011). Testing equity market efficiency around terrorist attacks. Applied Economics, 44, pp. 4087-4099.

Drakos, K. (2010). Terrorism activity, investor sentiment, and stock returns. Review of Financial Economics, 19, pp. 128-135.

Eldor, R. and R. Melnick (2004). Financial markets and terrorism. European Journal of Political Economy, 20, pp. 367-386.

Eldor, R., S. Hauser, Y. Kroll and S. Shoukair (2012). Financial Markets and Terrorism: The Perspective of the Two Sides of the Conflict. *Journal of Business Administration Research* 1, pp. 18-29.

Essaddam, N. and J.M. Karagianis (2014). Terrorism, country attributes, and the volatility of stock returns. Research in International Business and Finance, 31, pp. 87-100.

Fernandez, V. (2007). Stock Markets Turmoil: Worldwide Effects of Middle East Conflicts. Emerging Markets Finance and Trade, 43, pp. 58-102.

Frey, B.S. (2009). How can business cope with terrorism? Journal of Policy Modeling, 31, pp. 779-787.

Gaibulloev, K. and T. Sandler (2009). THE IMPACT OF TERRORISM AND CONFLICTS ON GROWTH IN ASIA. Economics & Politics, 21, pp. 359-383.

Global Terrorism Database (2012): Codebook: Inclusion Criteria and Variables, October 2012, National Consortium for the Study of Terrorism and Responses to Terrorism: University of Maryland.

Jain, S.C. and R. Grosse (2009). Impact of Terrorism and Security Measures on Global Business Transactions: Some International Business Guidelines. Journal of Transnational Management, 14, pp. 42-73.

Johnston, R.B. and O.M. Nedelescu (2006). The impact of terrorism on financial markets. Journal of Financial Crime, 13, pp. 7-25.

Karolyi, G. A. (2006). The Consequences of Terrorism for Financial Markets: What Do We Know? Ohio State University, Charles A. Dice Center for Research in Financial Economics.

Karolyi, G.A. and R. Martell (2010). Terrorism and the Stock Market. International Review of Applied Financial Issues and Economics, 2, pp. 285-314.

Keeney, G.L. and D.v. Winterfeldt (2010). Identifying and Structuring the Objectives of Terrorists. Risk Analysis, 30, pp. 1803-1816.

Kollias, C., S. Papadamou, and A. Stagiannis (2011). Terrorism and capital markets: The effects of the Madrid and London bomb attacks. International Review of Economics & Finance, 20, pp. 532-541.

Larobina, M.D. and R.L. Pate (2009). The Impact of Terrorism on Business. Journal of Global Business Issues, 3, pp. 147-156.

Larry, G. E. and T. Wang (1994) Intertemporal asset pricing under Knightian uncertainty. Econometrica, 62, pp. 283–322.

Lenain, P., M. Bonturi, and V. Koen (2002). The Economic Consequences of Terrorism, OECD Economics Department Working Papers, Organization for Economic Cooperation and Development, Paris CEDEX 16, Paris, France.

Levy, O. and I. Galili (2006). Terror and trade of individual investors. The Journal of Socio-Economics, 35, pp. 980-991.

Mukerji, S. and J.M. Tallon (2001). Ambiguity aversion and incompleteness of financial markets. Review of Economic Studies 68, pp. 883–904.

Nguyen, A.P. and C.E. Enomoto (2009). Acts Of Terrorism And Their Impacts On Stock Index Returns And Volatility: The Cases Of The Karachi And Tehran Stock Exchanges. International Business & Economics Research Journal 8, pp. 75-86.

Nikkinen, J., M. M. Omran, P. Sahlström and J. Äijö (2008). Stock returns and volatility following the September 11 attacks: Evidence from 53 equity markets. International Review of Financial Analysis, 17, pp. 27-46.

Peleg, K., J. L. Regens, J. T. Gunter and D. H. Jaffe (2011). The normalisation of terror: the response of Israel's stock market to long periods of terrorism. Disasters, 35, pp. 268-283.

Zussman, A. and N. Zussman (2006). Assassinations: Evaluating the Effectiveness of an Israeli Counterterrorism Policy Using Stock Market Data. The Journal of Economic Perspectives, 20, pp. 193-206.

TABLE 1: Country Wise Frequency Distribution of Terrorist Events and Human Loss, 1997-2011

This table shows the country wise number of terrorist events with respect to attack type, target type, weapon type and the extent of human loss from year 1997 to year 2011. There were 410 relatively major terrorist event took place in Bangladesh, India, Indonesia, Philippine and Sri Lanka. These 410 events caused 6581 deaths and more than 11000 injuries. More seventeen thousand people affected due to these major events.

	Bangladesh	India	Indonesia	Philippine	Sri Lanka
Attack Type					
Armed Assault	23	50	35	36	18
Assassination	8	4	5	4	6
Eombing/Explosion	34	36	14	20	32
Facility/Infrastructure Attack	4	6	4	4	6
Suicide	12	5	6	10	28
Target Type					
Business	20	7	16	13	13
Government	18	5	8	9	10
Private Citizens & Property	14	36	16	19	11
Religious Figures/Institutions	8	7	4	4	3
Security Forces	11	39	15	23	42
Transportation	10	7	5	6	11
Weapon Type					
Explosive/Dynamite	43	38	20	32	59
Firearms	24	47	29	35	17
Incendiary	6	7	10	3	10
Melee	8	9	5	4	4
Intensity					
Number of Incidents	81	101	64	74	90
Number of Injuries	1431	3332	838	1408	4000
Number of Deaths	246	2405	360	950	2620

TABLE 2: Impact of Terrorism around the Event Day

This table shows the results of dummy variable regressions to analyze the impact of 410 major terrorist events on the returns over five-day windows surround the events [-2, -1, 0, 1, 2]. Here, T=0 is the event day, or the first trading day immediately after the event; if the stock market is closed. The dependent variable is the continuous return of market index for Dhaka stock exchange, Bombay stock exchange, Jakarta stock exchange, and Philippine stock exchange and Colombo stock exchange. The independent variables are five distinct day's dummy variables. Event day's coefficient; *, **, *** denote significance at the 10%; 5%; and 1% level, respectively.

	DSE		BSE		JKSE		PSE		CSE	
Event Date	Coeff.	S.E.	Coeff.	S.E	Coeff.	S.E	Coeff.	S.E	Coeff.	S.E
Intercept	0.0005**	0.0003	0.0003***	0.0000	0.0005	0.0003	0.0003	0.0003	0.0008***	0.0002
T=-2	0.0002	0.0017	-0.0001	0.0001	0.0039*	0.0023	-0.0001	0.0019	-0.0005	0.0013
T=-1	-0.0003	0.0017	0.0001	0.0001	0.0010	0.0023	-0.0015	0.0019	-0.0012	0.0013
T=0	-0.0046***	0.0017	0.0000	0.0001	-0.0067***	0.0023	-0.0049***	0.0019	-0.0040***	0.0013
T=+1	-0.0036**	0.0017	0.0000	0.0001	0.0010	0.0023	-0.0005	0.0019	-0.0033**	0.0013
T=+2	0.0026	0.0017	-0.0001	0.0001	-0.0001	0.0023	-0.0005	0.0019	-0.0011	0.0013
Durbin-Watson test:										
DW		1.8700		1.8554		1.7070		1.7402		1.6140
Breusch–Pagan test:										
F-statistic		1.1516		1.0059		0.8820		0.5531		0.6622
N		3710		3583		3527		3475		3631

TABLE 3: Impact of Terrorism With Respect To Attack Type

This table shows the results of OLS regression models with index return as dependent variable and five distinct attack types' dummy variables as independent variables (separately for each country). Terrorist events distinguished into five distinct categories namely Assassination, Armed Assault, Facility/Infrastruct (Facility/Infrastructure Attack), Suicide and Bombing/Explosion (See the detail of all variables in appendix 1). Attack types coefficients; *, **, *** denote significance at the 10%; 5%; and 1% level, respectively.

Variable	DSE Coeff.	DSE S.E	BSE Coeff.	BSE S.E	JKSE Coeff.	JKSE S.E	PSE Coeff.	PSE S.E	CSE Coeff.	CSE S.E
Intercept	0.0005**	0.0003	0.0003***	0.0000	0.0006*	0.0003	0.0002	0.0003	0.0007***	0.0002
Armed Assault	0.0031	0.0032	0.0000	0.0001	-0.0079***	0.0030	-0.0024	0.0026	0.0014	0.0030
Suicide	-0.0170***	0.0044	-0.0001	0.0004	-0.0057	0.0073	-0.0104**	0.0050	-0.0057**	0.0024
Bombing/Explosion	-0.0063**	0.0026	-0.0001	0.0001	-0.0098**	0.0048	-0.0079**	0.0035	-0.0050**	0.0022
Facility/Infrastruct	0.0116	0.0077	0.0006*	0.0003	0.0075	0.0090	0.0037	0.0079	-0.0043	0.0051
Assassination	-0.0087	0.0054	-0.0002	0.0004	-0.0040	0.0080	-0.0055	0.0079	-0.0052	0.0051
Durbin-Watson test:										
DW		1.8702		1.8554		1.7085		1.7412		1.6154
Breusch–Pagan test:										
F-statistic		0.7244		0.8209		0.3795		0.4212		0.1056
N		3710		3583		3527		3475		3631

TABLE 4: Impact of Terrorism With Respect To Target Type

This table shows the results of OLS regression models in which dependent variable is country's stock market index return and independent variable are six distinct target types' dummy variables. The regressions are ran separately for each country. Terrorist events distinguished into six distinct categories of Business, Government, Pvt. Cit. & Prop. (Private Citizens & Property), Rel. Fig./Ins. (Religious Figures/Institutions), and Security Forces (See the detail of all variables in appendix 1). Target types coefficients; *, **, *** denote significance at the 10%; 5%; and 1% level, respectively.

Variable	DSE Coeff.	S.E	BSE Coeff.	S.E	JKSE Coeff.	S.E	PSE Coeff.	S.E	CSE Coeff.	S.E
Intercept	0.0005**	0.0003	0.0003***	0.0000	0.0006*	0.0003	0.0002	0.0003	0.0007***	0.0002
Pvt. Cit. & Prop.	-0.0040	0.0041	0.0000	0.0001	-0.0022	0.0045	-0.0059	0.0036	0.0019	0.0038
Government	0.0010	0.0036	-0.0001	0.0004	-0.0069	0.0063	-0.0004	0.0053	-0.0033	0.0040
Rel. Fig./Ins.	-0.0034	0.0054	-0.0002	0.0003	0.0004	0.0090	-0.0003	0.0079	-0.0037	0.0072
Business	-0.0104***	0.0034	-0.0001	0.0003	-0.0088**	0.0045	-0.0115***	0.0044	-0.0087**	0.0035
Security Forces	-0.0124***	0.0046	0.0001	0.0001	-0.0136***	0.0046	-0.0022	0.0033	-0.0040**	0.0019
Transportation	0.0037	0.0049	-0.0002	0.0003	-0.0006	0.0080	-0.0062	0.0064	-0.0041	0.0038
Durbin-Watson test:										
DW		1.8674		1.8554		1.7081		1.7403		1.6144
Breusch–Pagan test:										
F-statistic		1.2308		0.3600		0.2568		0.3094		0.0973
N		3710		3583		3527		3475		3631

TABLE 5: Impact of Terrorism With Respect To Weapon Type

This table shows the results of five OLS regression models. The dependent variable is country's stock market index return and independent variable are four weapon types' dummy variables. The regressions are ran separately for each country. Terrorist events distinguished into four Firearms, Explosive/Dynamite, Incendiary and Melee. (See the detail of all variables in appendix 1). Weapon types coefficients; *, **, *** denote significance at the 10%; 5%; and 1% level, respectively.
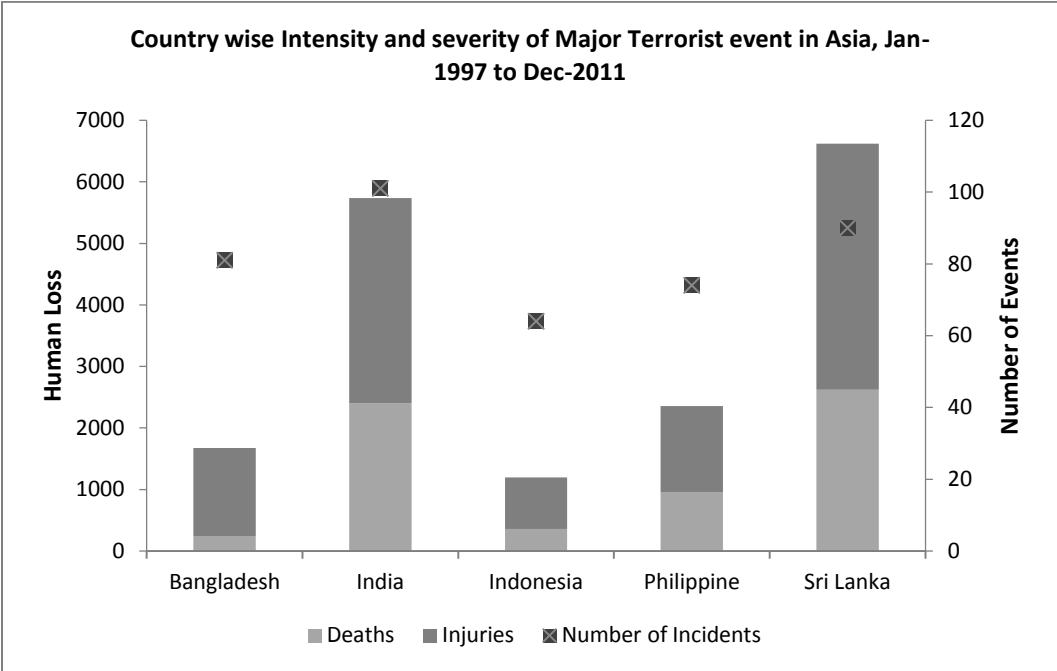
Variable	DSE Coeff.	DSE S.E	BSE Coeff.	BSE S.E	JKSE Coeff.	JKSE S.E	PSE Coeff.	PSE S.E	CSE Coeff.	CSE S.E
Intercept	0.0005**	0.0003	0.0003***	0.0000	0.0006*	0.0003	0.0002	0.0003	0.0007***	0.0002
Firearms	0.0007	0.0031	0.0000	0.0001	-0.0026	0.0033	-0.0032	0.0027	-0.0009	0.0031
Explosive/Dynamite	-0.0068***	0.0024	0.0000	0.0001	-0.0125***	0.0040	-0.0066**	0.0028	-0.0049***	0.0016
Incendiary	-0.0092	0.0063	0.0000	0.0003	-0.0070	0.0057	-0.0032	0.0091	-0.0054	0.0040
Melee	-0.0050	0.0054	0.0002	0.0003	-0.0082	0.0080	-0.0055	0.0079	0.0021	0.0063
Durbin-Watson test:										
DW		1.8666		1.8565		1.7056		1.7392		1.6145
Breusch–Pagan test:										
F-statistic		0.8803		0.2185		0.2410		0.3688		0.1316
N		3710		3583		3527		3475		3631

TABLE 6: Impact of Terrorism With Respect To Severity

This table shows the impact of the number of deaths and injuries on the perforce of stock markets. Here the dependent variable is stock index return and the independent variable are the number of deaths and number of injuries. The OLS regression is ran separately for each country. Event's severity coefficients; *, **, *** denote significance at the 10%; 5%; and 1% level, respectively.

	DSE		BSE		JKSE		PSE		CSE	
Variable	Coeff.	S.E	Coeff.	S.E	Coeff.	S.E	Coeff.	S.E	Coeff.	S.E
Intercept	0.0018	0.0023	0.0007	0.0030	0.0020	0.0019	-0.0006	0.0021	0.0007	0.0012
Deaths	-0.0008***	0.0003	-0.0001	0.0001	-0.0014***	0.0003	-0.0003*	0.0002	-0.0002***	0.0000
Injured	-0.0002***	0.0001	0.0000	0.0000	-0.0001**	0.0001	0.0000	0.0001	0.0000	0.0000
Durbin-Watson test:										
DW		1.7462		1.9838		2.3023		1.7620		1.9578
Breusch–Pagan test:										
F-statistic		0.0457		0.3298		1.5896		0.5240		0.8108
N		81		100		64		74		90

Figure 1: Country Wise Number of Events, Deaths and Injuries, Jan-1997 to Dec-2011

Appendix 1: List of Variables and Their Descriptions

Variable	Description
Assassination	An act whose primary objective is to kill one or more specific, prominent individuals. Usually carried out on persons of some note, such as high-ranking military officers, government officials, celebrities, etc. Not to include attacks on non-specific members of a targeted group. The killing of a police officer would be an armed assault unless there is reason to believe the attackers singled out a particularly prominent officer for assassination.
Armed Assault	An attack whose primary objective is to cause physical harm or death directly to human beings by use of a firearm, incendiary, or sharp instrument (knife, etc.). Also included under this attack type would be CBRN (chemical, biological, radiological, nuclear) weapons. Not to include acts of a purely personal or criminal nature, or acts in which people are incidentally harmed in pursuit of another primary objective. Not to include attacks involving the use of fists, rocks, sticks, or other handheld (less-than-lethal) weapons.
Bombing/Explosion	An attack where the primary effects are caused by an energetically unstable material undergoing rapid decomposition and releasing a pressure wave that causes physical damage to the surrounding environment. Can include either high or low explosives (including a dirty bomb) but does not include a nuclear explosive device that releases energy from fission and/or fusion, or an incendiary device where decomposition takes place at a much slower rate.
Facility / Infrastructure Attack	An act, excluding the use of an explosive, whose primary objective is to cause damage to a non-human target, such as a building, monument, train, pipeline, etc. Such attacks include arson and various forms of sabotage (e.g., sabotaging a train track is a facility/infrastructure attack, even if passengers are killed). Facility/infrastructure attacks can include acts which aim to harm an

	installation, yet also cause harm to people incidentally (e.g. an arson attack primarily aimed at damaging a building, but causes injuries or fatalities).
Suicide	Where there is evidence that the perpetrator did not intend to escape from the attack alive.
Business	Businesses are defined as individuals or organizations engaged in commercial or mercantile activity as a means of livelihood. Any attack on a business or private citizens patronizing a business such as a restaurant, gas station, music store, bar, café, etc. This includes attacks carried out against corporate offices or employees of firms like mining companies, or oil corporations. Furthermore, includes attacks conducted on business people or corporate officers. Included in this value as well are hospitals and chambers of commerce and cooperatives. Does not include attacks carried out in public or quasi-public areas such as "business district or commercial area", (these attacks are captured under "Private Citizens and Property", see below.)
Government	Any attack on a government building; government member, former members, including members of political parties in official capacities, their convoys, or events sponsored by political parties; political movements; or a government sponsored institution where the attack is expressly carried out to harm the government. This value includes attacks on judges, public attorneys (e.g., prosecutors), courts and court systems, politicians, royalty, head of state, government employees (unless police or military), election-related attacks, intelligence agencies and spies, or family members of government officials when the relationship is relevant to the motive of the attack.
Security Forces	This value includes attacks on members of the police force or police installations; this includes police boxes, patrols headquarters, academies, cars, checkpoints, etc. Includes attacks against jails or prison facilities, or jail or prison staff or guards. Includes attacks against army units, patrols, barracks, and convoys,

	jeeps, etc. Also includes attacks on recruiting sites, and soldiers engaged in internal policing functions such as at checkpoints and in anti-narcotics activities.
Private Citizens & Property	This value includes attacks on individuals, the public in general or attacks in public areas including markets, commercial streets, busy intersections and pedestrian malls. Also includes ambiguous cases where the target/victim was a named individual, or where the target/victim of an attack could be identified by name, age, occupation, gender or nationality. This value also includes ceremonial events, such as weddings and funerals. The GTD contains a number of attacks against students. If these attacks are not expressly against a school, university or other educational institution or are not carried out in an educational setting, these attacks are coded using this value. Also, includes incidents involving political supporters as private citizens and property, provided that these supporters are not part of a government-sponsored event. Finally, this value includes police informers.
Religious Figures/Institutions	This value includes attacks on religious leaders, (Imams, priests, bishops, etc.), religious institutions (mosques, churches), religious places or objects (shrines, relics, etc.). This value also includes attacks on organizations that are affiliated with religious entities that are not NGOs, businesses or schools. Attacks on religious pilgrims are considered "Private Citizens and Property;" attacks on missionaries are considered religious figures.
Transportation	Attacks on public transportation systems are included in this value. This can include efforts to assault public buses, minibuses, trains, metro/subways, highways (if the highway itself is the target of the attack), bridges, roads, etc. The GTD contains a number of attacks on generic terms such as "cars" or "vehicles." These attacks are assumed to be against "Private Citizens and Property" unless shown to be against public transportation systems.

	In this regard, buses are assumed to be public transportation unless otherwise noted.
Explosive/Dynamite	A weapon composed of energetically unstable material undergoing rapid decomposition and releasing a pressure wave that causes physical damage to the surrounding environment.
Firearms	A weapon which is capable of firing a projectile using an explosive charge as a propellant.
Incendiary	A weapon that is capable of catching fire, causing fire, or burning readily and produces intensely hot fire when exploded.
Melee	A weapon that does not involve a projectile in which the user and target are in contact with it simultaneously.
Deaths	This field stores the number of total confirmed fatalities for the incident. The number includes all victims and attackers who died as a direct result of the incident.
Injuries	This field records the number of confirmed non-fatal injuries to both perpetrators and victims

Source: Global Terrorism Database, University of Maryland