Impact of Terrorism on Stock Market: Evidence from Developed and Developing markets

Abstract

This study examines the impact of terrorism on stock market returns through an extensive dataset of 23 countries over the period of 2001-2017. Stock market returns are examined in the context of different aspects of terrorist attacks such as number of suicide attack, number of people killed in terrorist attacks, attacks in major and capital city, the distance of terrorist attack from capital city, property damaged due to terrorist attack and nationality of the victims being killed in a terrorist attack. Consistent with previous studies, our regression analysis reveals that assaults in capital city and severity of attacks negatively influence the index returns. Particularly, the results provide some new insights, with respect to terrorist attacks intended for targeting specific locations with strategic advantages, and assaults in close proximity of capital are found to have more pronounced and devastating effect on the stock market returns. Moreover, foreigners are strategically more valuable targets for terrorists in order to disrupt the smooth functioning of capital markets. The analyses of sub samples, reveal that developing economies are more fragile and developed markets are more resilient to terrorism. Our robust analysis through event methodology confirms our main findings and reveal that negative response of stock market to terrorist attacks is more prominent in developing countries and developed capital markets are more resilient to the negative shocks of terrorist attacks.

1. Introduction

Terrorist attacks wreaked havoc to the capital markets across the globe. The terrorist attack of September 11, 2001 dented investors' confidence and caused panic selling (Chaudhry, Roubaud, Akhter, & Shahbaz, 2018; Seabra, Reis, & Abrantes, 2020). Consequently, the losses of Dow Jones exceeded 7% even after the resumption of regular trade six days later and a sharp decline of 4.5% in MSCI returns. Similarly, the terrorist attacks of March 11, 2004 on Madrid dropped the MSCI by 1.72 % (Papakyriakou, Sakkas, & Taoushianis, 2019).

The overreaction of market participants to terrorist attacks makes the capital markets' more fragile. Theoretically, Prospect theory justified that the overreaction to such unprecedented incongruities is emotional rather than rational (Tversky & Kahneman, 1979). Investors generally feel stronger impulse to avoid losses than to acquire gains (Seabra et al., 2020). Hence, when investors perceive the existence of any risk of terrorism, they become reluctant to trade in such vulnerable environment and tend to adopt risk-reducing strategies thereby shifting their investments to safer places, which further exacerbate economic stability (Gok, Demirdogen, & Topuz, 2020). Johnston and Nedelescu (2005) categorized the economic repercussions of terrorism into three categories such as direct costs, indirect costs and productivity costs. The direct costs include humans' killings, destruction of property and infrastructure. The confidence's loss of market participants and higher transaction costs are included in indirect and productivity cost respectively.

Several empirical studies have analyzed the financial and economic aspects of terrorism. For instance, Enders & Sandler (1996); Eckstein & Tsiddon (2004); and Abadie & Gardeazabal (2008) determined the impact of terrorist assaults on foreign direct investment, consumption and gross domestic product (GDP) and reported a positive association of terrorism with transaction costs and military expenditure[1]. Further, the literature also investigated the repercussions of terrorism over the capital markets. The common findings revealed that terrorist attacks have been negatively (positively) associated with stock returns (volatility)[2]. Arin, Ciferri and Spagnolo (2008) argued that shocks of terrorism towards capital markets are more pronounced in emerging vis-à-vis developed markets. Charles and Darné (2006) found that US capital markets were less affected

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[1] Enders and Sandler (1996); Eckstein and Tsiddon (2004); Enders and Sandler (1996); Levy and Galili (2006)

[2] Corbet, Gurdgiev, and Meegan (2018); Goel, Cagle, and Shawky (2017); Kollias, Manou, Papadamou, and Stagiannis (2011); Arin, Ciferri, and Spagnolo (2008); Hussain, Shah, and Ahmad (2017)

than European and Tokyo stock markets due to deadly 9/11 terrorist attack. The findings of Kollias, Papadamou and Stagiannis (2011) revealed that Athens' stock market was more fragile to terrorist attacks than London stock exchange. They argued that the fragility of stock market to terrorism is primarily attributed to the market's size and maturity. Goel, Cagle and Shawky (2017) found a persistent negative effect of 9/11 attacks on S&P 500 index during the analysis of 49 terrorist attacks.

The current research contributes to literature in several ways. Several research studies suggest that the relationship between terrorism and stock market must be corroborated by empirical evidence (Drakos, 2010; R. Eldor & Melnick, 2004; MengYun et al., 2018; Peleg, Regens, Gunter, & Jaffe, 2011). Following this line of reasoning, Gok et al. (2020) determined a negative effect of terrorism on stock return in Turkey; Chaudhry et al. (2018) in SAARC region; Bevilacqua, Morelli, and Uzan (2019) in developed countries; Corbet et al. (2018) in Europe; and Khan & Ahmed (2019) in Pakistan. Furthermore, the literature also established the association of terrorist attacks with market volatility[3]. Although, the findings of these studies contribute useful insight to the contemporary literature on the investigation between terrorism and stock market, however, very little attention has been paid to consider a large global sample. Therefore, our study considered a large of sample of 23 countries which covers different regions such as developed, developing, and Middle Eastern and North African (MENA) countries to examine the effects of terrorism on overall stock markets returns. The sample is further segregated into developed and developing countries in order to test whether the effects of terrorist attacks are persistent across regions.

Secondly, we categorize the terrorists' attacks across various lines such as terrorist attacks in specific location with number of strategic advantages such as populated urban area, areas of significant economic activity, and iconic sites. During and after the terrorist attacks these areas usually grab media coverage quickly and enable the militants to spread their ideology more easily (Marineau, Pascoe, Braithwaite, Findley, & Young, 2018). The Al Shabab's attacks on the Westgate shopping center in Nairobi (September, 2013), and terrorists' attacks in Brussels (May, 2014), Paris (November 2015), Dhaka (July 2016), and Kabul (January 2018) shared much in common. The results of Aslam and Kang (2015) also supported the notion that the effects of terrorist attacks on stock market varies across locations. However, Eldor and Melnick (2004)

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[3] Mnasri and Nechi (2016); Nguyen and Enomoto (2009)

reported that terrorist attacks based on location were irrelevant for the financial markets in Israel. Hence, we construct three variables such as terrorist attacks in major cities, terrorist attacks in capital city and terrorist attacks which happened within the close proximity of a capital city to examine any heterogeneous effect of terrorism on capital markets with respect to the location of terrorist assaults.

Thirdly, foreigners are strategically more valuable targets vis-à-vis attacking local citizens. Neumayer and Plümper (2011) argued that terrorist groups may easily label the foreigners from detested countries as infidels and suppressors. Furthermore, countries largely dependent upon foreign aid may be influenced by these foreign governments to adopt policies and measures that may be immensely unpopular in the host countries and may lead to unrest among the local masses and in extreme cases may lead to devastating terrorist assaults on foreigners belonging to these countries. Hence, terrorist groups directly attack the foreigners and their supporter of home government with the hope of triggering a decline in foreign support for the home government or even their complete withdrawal from the home country (Crenshaw, 1981; Kydd & Walter, 2006; Plümper & Neumayer, 2010). In line with these arguments the current study extends its investigation to explore the effect of attack on foreign nationals on major stock markets.

The findings of this study reveal that stock market returns are negatively affected by the severity of attacks, terrorist assaults in capital city, and attacks within close proximity of capital city. The results are in line with prospects theory. Furthermore, consistent with notion of rational theory of terrorism, the results reveal that an attack on foreign national negatively influence the index return. Robust with previous empirical studies, we also confirm that impact of terrorist assaults is more prominent in developing economies than developed markets.

Remainder of the paper is arranged as follows; Section 2 corresponds to review of prior literature; Section 3 highlights the research method employed; Section 4 provides detailed analysis and discussion and in section 5 we conclude the study and also provide several theoratical and policy implications and future research directions.

2. Literature Review

2.1 Different aspects of terrorist attacks

The surge in terrorism has been considered an imminent threat to the economic stability and security across the globe (Hobbs, Schaupp, & Gingrich, 2015). Terrorism is conceptualized as an illegitimate use of force or violence to attain specific objectives such as a political, economic, religious, or social objectives through fear, intimidation and coercion by the non-state actors (Lutz & Lutz, 2020). Terrorist strive to achieve their objectives by inflicting losses across different aspects of the social fabric of a country ranging from loss of human lives to destruction of valuable physical infrastructure. The pervious literature established the relationship of different economic and financial aspects such as FDI, foreign trade, economic development, economic policies, stock market, and stock price crash risk with terrorism (Kong, Xiong, & Xiang, 2021; Meierrieks & Schneider, 2021; Zakaria, Jun, & Ahmed, 2019). For instance, Enders and Sandler (1996) observed a downfall in FDI by 13.5% in Spain and 11.9% in Greece in relation to terrorist risks. Similarly, Abadie and Gardeazabal (2003) observed that terrorist attacks lowered the GDP of Basque region by 10%.

One possible justification of capital outflow could be that developed economies have sustainable economic growth since revolutions and wars are rare in developed countries (Blomberg & Mody, 2005). On the other hand, the developing economies are featured with socio-political turmoil, which creates a chaotic environment for the investors. Hence, the outflow of capital intensified from developing economies to safer developed countries. Empirical results are consistent with the notion of the prospect theory, which states that investors generally feel a stronger impulse to avoid losses than to acquire gains. Due to this higher sensitivity towards losses, investors strive to take their investment to safer places. Furthermore, terrorism also has negative consequences for the multilateral trades among countries, because terrorist attacks increase costs of doing business, transaction cost for acquisition of assets and risk of destruction of traded goods (Frey et al., 2007). Moreover, Llussá and Tavares (2011) reported on a negative effect of terrorism on economic growth. Crain and Crain (2006) also reported that terrorist attacks negatively affect the economic growth in consistency with the studies of Blomberg, Hess; Orphanides (2004); Blomberg and Hess (2008); and Walkenhorst and Dihel (2002)

Following this strand of research, literature also provided empirical support on how terrorism affects financial markets such as equity, bond, foreign exchange and commodity markets (Gok et al., 2020). The empirical studies analyzing capital markets, revealed the common finding that

terrorist attacks cause direct losses to capital markets, since stock prices respond negatively to terrorist attacks thereby making the terrorism affected countries more fragile to potential terrorists' intimidation (Aksoy, 2014; Ciferri, & Spagnolo 2008; Brounen & Derwall, 2010; Charles & Darné, 2006; Eruygur & Omay, 2014; Nikkinen & Vähämaa, 2010). Brounen and Derwall (2010) reported on the negative impact of terrorist attacks on stock returns of eight developed countries. They observed that in the aftermath of deadly terrorist incidents, these capital markets recovered within a week. Chaudhry, Roubaud, Akhter and Shahbaz (2018) examined the impact of terrorism on stock returns of SAARC countries by employing static model and event methodology on subsamples such as high and less terrorism affected countries. They concluded that attack's types such as bombing has been more pronounced to cause negative stock returns in high terrorism affected members states. Whereas, negative response of stock prices has been reported in relation to terrorist incidents such as assassination and hostage crises in less affected countries. The study of Goel et al. (2017), considered 49 terrorist attacks to examine the impact of terrorism on S&P500 index and concluded on short lived impact of terrorist attacks on S&P Index except 9/11 during the sample of 1991-2010. Kollias et al. (2011) argued that the negative response of equity prices to terrorist attacks is determined on the basis of market's size and maturity. They reported that London stock exchange was less responsive vis-à-vis Athens stock market. The resilience of LSE has been attributed to presence of strong institutional specificities and strong discipline mechanism.

Furthermore, Eldor, Hauser, Kroll, and Shoukair (2012) supported the notion that impact of terrorist attacks varies across the severity of attacks. They reported that higher (lower) intensity of terrorist attacks yield larger (smaller) negative impact on stock returns. The study of Aslam and Kang (2015), revealed that different terrorist attacks such as suicide and bombing/explosion have disastrous impact over the Asian markets. The analysis further reported that severity of terrorist incidents determined the magnitude of impact of terrorist incidents on stock market return. The higher level of severity led to greater impact on stock market performance. Similarly, Eldor and Melnick (2004) examined the relationship of terrorism with stock market and exchange rate in Israel. The study found a permanent impact of suicide attacks on financial markets. They also reported that terrorist attacks based on location were least relevant for the financial markets' behavior during the sample period. Further, the results suggested that the arrival of favorable news such as the assassinations of senior terrorist leaders positively contributed to equity prices.

Whereas, negative equity price response was observed following the assassination of senior political leaders.

Numerous research studies have explored terrorism and stock volatility. For instance, Corbet, Gurdgiev and Meegan (2018) observed that domestic and international terrorist attacks triggered volatility in major European capital markets and specifically, terrorist attacks from the Islamic State in Iraq and the Levant (ISIL) were found to have a prominent impact on stock market since 2011. Likewise, Mnasri and Nechi (2016) reported that the significant impact of terrorist attacks on stock markets' volatility persisted for 20 trading days that occurred during the sample period of 2003-2015 in Middle East and North African countries. Nguyen and Enomoto (2009) examined the impact of terrorism on capital markets in Indonesia, London, Madrid, and Iraq and reported on a negative impact of these anomalies (terrorist attacks) on equity prices. Arin et al. (2008) reported that the significant impact of terrorist attacks on stock returns and volatility in developed and emerging economies. However, the impact of terrorism was more pronounced in emerging economies than developed markets. In addition, empirical literature also reports on the relationship of terrorism with sector-based indices. For instance, Kolaric and Schiereck (2016) and Chesney, Reshetar, and Karaman (2011) empirically found that equity prices of airline and insurance sectors were negatively associated with terrorist attacks, whereas, stocks in defense sector were found to be positively influenced by terrorist activities.

Moreover, a number of empirical studies reported on the negative effects of terrorist attacks on infrastructures which in turn hamper financial and economic development. Specifically, the terrorist groups target infrastructure which carries strategic, symbolic and economic importance (Koknar, 2009). Makarenko (2004) categorized these terrorist intimidations on infrastructure particularly in energy sector into different categories based on the method of the assault. For instance, terrorists employ bombing attacks and/or sabotage the pivotal oil and gas pipeline to disrupt the supply of oil and gas for exerting substantial political pressure and provoking corporate concession, consequently damaging the national exchequer. The second form of terrorist attacks is symbolic in nature, in which terrorists attack the easily accessible office of oil companies situated in the large cities. Such assaults are strategically carried out to grab media attention thereby creating chaos, which enable the terrorists to easily spread their radical ideologies. Johnston and Nedelescu (2005) considered the destruction of infrastructure as direct cost of

terrorism. Orbaneja, Iyer, and Simkins (2018) empirically found a negative relationship between crude oil prices and terrorist attacks on oil infrastructure.

Besides, the locations with strategic, symbolic and economic significance are more fragile to terrorist attacks. Terrorist attacks on these locations are more attractive for terrorists as it is an obvious way to be covered by the global news which enables the terrorist groups to spread their ideology more easily. For example, terrorist attacks of Al Shabab operatives attacking the Westgate shopping center in Nairobi (September, 2013), terrorist attacks in Brussels (May 2014), Paris (November 2015), Dhaka (July 2016), and in Afghanistan (January 2018) shared much in common (Aslam & Kang, 2015; Enders & Sandler, 2006; Li & Schaub, 2004; Marineau et al., 2018; Piazza, 2008). The study of Aslam and Kang (2015) revealed that the effects of these terrorist assaults vary across location. Marineau et al. (2018) argued that five factors such as security of a target location, accessibility, symbolism, material harm, and exclusion contribute to the likelihood of terrorist attacks.

2.2 Nationality

The rational theory of international terrorism (Neumayer & Plümper, 2011) advocates that foreign nationals are strategically significant targets for terrorist compared to the local residents. In the context of this theory Crenshaw, (1981), Crenshaw (2001) , Kydd & Walter, (2006) and Pape, (2003) put forward three reasons to explain the attacking foreign nationals will result in more strategic benefits for terrorist organization.

Firstly, nationality of the victims can determine the extent of media attention given to a specific terrorist attacks. For example global media network and media houses (CNN, FOX News etc) are dominated by companies in the Western Countries. Thus attacks on nationals of Western Countries can cause a huge uproar across these media networks and this will enable the terrorists to propagate their fright and ideology with greater ease and attention. Thus compared to local nationals foreign national becomes more strategically important for inflicting successful terrorist attacks.

Secondly terrorist groups achieve reputation among its peer outfits by attacking foreign nationals especially if the foreign citizens belong to countries which openly antagonize terrorism and its outfits. Further, citizens of the countries that support and sympathize with the victim countries are

also under the hit list of terrorist groups. The citizens of these hated countries are brutalized on the pretexts of being infidels, suppressors and exploiters.

Thirdly some governments are hugely supported by foreign countries especially for their funds requirements. Such governments' policies are influenced by their foreign supporters and may compel these governments to formulate and implement unpopular policies that will aggravate the relationship of these governments with domestic terrorist outfits. In line with this argument terrorist attacks become more probable against the citizens of the countries that provide any political, financial and military assistance to domestic governments. The military support in particular is quite significant in curtailing and mitigating the risk of terrorist attacks which is the ultimate goal of terrorist organization. Thus in order to cope with this constraint of carrying out terrorist attacks because of foreign aid, it is more likely that terrorist groups attacks citizens from these foreign countries that may trigger a decline in the support from foreign countries and may also result in the complete withdrawal of their forces.

There are contemporary empirical studies which provide evidence regarding the stock market performance and economic growth, however, there is scant literature about the role of several significant aspect of terrorist attacks such as attacks on strategic location and victims' nationality is still debatable and the evidence regarding their role in shaping stock market behavior still remains inconclusive. In this context this research endeavors to fill this gap in contemporary research literature by investigating the influence of different heterogeneous aspects of terrorist attacks (terrorist assaults on strategically important location, attacks on capital city and cities in close proximity of the capital city and terrorist assaults against foreign nationals) on stock market returns.

Secondly our contribution derives from the fact that this study employs an extensive dataset of 23 countries covering different regions such as developed and underdeveloped countries. Previous literature encompasses empirical literature which is either focused one country or their investigation was limited to a single region. In this context this study will provide useful implications based on the comparison of developed and underdeveloped regions. The sub sampling of countries into developed and developing countries provides authenticity on the persistence of our results across these two samples.

Thirdly, the utilization of subsamples, and data posit various challenges for comparing research completed by different scholars. In line with this, our work relates to a small number of studies that examine the terrorism and stock returns nexus through advanced statistical techniques and the results are further tested in event methodology framework for robustness.

3. Methodology

3.1. Data Description

This research study investigates the impact of terrorism on stock market. For this purpose, two datasets were used. First dataset is related to daily index returns of 23 stock markets both from developed and developing countries and the second dataset include the terrorism data. Selected countries included developed and developing economies such as United States, United Kingdom, Russia, France, Turkey, Pakistan, Sri Lanka, India and Philippines among many others. The list of 23 countries is reported in table 01. The excluded countries either did not had developed stock market or had very small number of terrorist attacks. For instance, Afghanistan does not have any stock exchange despite the fact that it has sustained huge losses due to large number of terrorist attacks. The two sub samples for developing and developed countries were created using the Human Development Index (HDI). Any country having an HDI of 0.8 or higher was categorized as developed country (Arto et al., 2016). HDI is a better measure than per capita income or any other development indicator to distinguish between developing and developed countries. HDI is more holistic measure as compared to others economic measure of development because it is based on a multivariate methodology of education, health and living standards. It is well documented in literature that terrorism is related to economic inequality (Estrada et al., 2015), education level (Durodie, 2016) and poverty (Brockhoff et al., 2015).

The data include 38,083 terrorist events that took place from January 2001 to December 2017. Further, we restricted our sample to only those attacks which resulted in at-least one death. The reason for limiting the sample was to only focus on prominent attacks. The daily closing prices of indices were collected from Compustat Database and websites of the respective stock exchanges.

The terrorism data was collected from Global Terrorism Database (GTD)[4]. Further the risk-free rate data was downloaded from International Monetary Fund Database.

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[4] Comparative studies of different data sources do have found certain biases related to GTD. While comparing the terrorist incidents in Andhra Pradesh, India, from GTD and police reports, the study of Behlendorf et al's (2016) found that GTD underestimates the terrorist attacks as compared to police reports. Similarly, the study of Cubukcu and Forst's (2017) compared the terrorist incidents in GTD and Turkish National Police Database. They concluded that more severe attacks are likely to be included in GTD.

Table 01: List of countries in the Study Sample

Developed Countries (07)

Chile, France, Greece, Israel, Spain, United Kingdom, United States

Developing Countries (16)

Bangladesh, Brazil, Colombia, Egypt, India, Indonesia, Iraq, Mexico, Nigeria, Pakistan, Peru, Philippines, Russia, Sri Lanka, Thailand, Turkey

3.2. Operationalization

3.2.1 Terrorism

Terrorism was divided into eight main categories such as total number of attacks, number of suicide attacks, total number of people killed in terrorist attacks, attacks in major and capital city, attacks within close vicinity of capital city, number of attacks that caused property damage and lastly number of attacks on foregn nationals. The measurment of each type of attack is presented in table 1.

Table 02: Measurement of Terrorist Attacks

Type of Attack	Description
Attack	Total number of terrorist attack on specific date for each country.
Suicide Attack	Total number of suicide attacks
Kill	Total number of people killed in terrorist attack(s)
Major City	Number of terrorist attacks in top 10 cities with highest population in each country on a specific date (excluding the attack in capital city).
Capital City	Number of terrorist attacks in capital city
Capital City Distance	Number of terrorist attacks within 100 km radius of the capital city
Property Damage	Total number of attacks that resulted in damage to property

Nationality	Number of attacks on foreign nationals. For instance, a terrorist attack on U.S. citizen in Pakistan is considered as an attack on foreign nationals.

3.2.3 Econometric Model

The study analyzes the relationship between terrorism and index returns in static panel data framework. Hsiao (1986) argued that panel regression estimation has several benefits. Firstly, the panel estimation accounts for unobserved heterogeneity. Secondly, large numbers of observations provide more degree of freedom. Thirdly, panel data addresses the issue of collinearity among explanatory variables.

The daily logarithmic index returns (R_{it}) are calculated by using the Equation (1), where (i) and (t) denote the country and day, respectively.

$$R_{it} = \text{Ln}(\frac{I_{(i,t)}}{I_{i(t-1)}}) \dots (1)$$

In equation (1) R_{it} is the return on the index for period t, I_{it} is the value of index at the end of period t, $I_{i(t-1)}$ is the value of the index at the end of period t – 1. After calculating index return, we regress it on the variables of interest.

$$y_{it} = \alpha_1 + \alpha_2 x_{it} + \varepsilon_{it} \dots (2)$$

In equation (2), Y_{it} denotes the index returns for country i at time t. while X_t corresponds to the explanatory variable i.e., terrorism. In equation (2) α_1 represents the constant term of the regression line. Furthermore, owing to the discrete nature of the dependent variable we collect the timing of the terrorist attacks, so that the impact of a terror attack can be incorporated in prices either on the same day of the attack or the day after without violating market efficiency. Further to overcome this problem, we include the first lag of each proxy of terrorism in following econometric model. The autoregressive term is also included to cater for the auto and serial correlation problem.

$$R_{it} = \beta_0 + \beta_1 R_{it-1} + \beta_2 Attack_{it-1} + \beta_3 \text{Suicide } Attack_{it-1} + \beta_4 \text{Kill}_{it-1} + \beta_5 \text{Major City}_{it-1} +$$
$$\beta_6 \text{Capital City}_{it-1} + \beta_7 \text{Capital City Distance}_{it-1} + \beta_8 \text{Property Damage}_{it-1} +$$
$$\beta_9 \text{Nationality}_{it-1} + \alpha_i + \varepsilon_{it} \dots (3)$$

In equation (3), R_{it} is the index return for period t and country i, R_{it-1} denotes the lag index returns, $Attack_{it-1}$ stands for total number of terrorist attacks for country i in time t-1. Suicide $Attack_{it-1}$ is lag of suicide attacks, Kill_{it-1} represents the number of persons killed in terrorist attacks at t-1, Major City$_{it-1}$ is lag of terrorist attacks on major city, Capital City$_{it-1}$ denotes the lag of terrorist attacks on capital city, Capital City Distance$_{it-1}$ is lag of terrorist assaults within 100 kilometer radius from the capital city, Property Damage$_{it-1}$ represents the lag terrorist attacks on property, Nationality$_{it-1}$ corresponds to the lag of terrorist attacks on foreign nationals and finally α_i represents the intercept of each cross-section.

3.2.2 Event Study Methodology

In addition to regression analysis, this study also applies event study methodology to explore that how much time an aspect of terrorism takes to affect the market. For the purpose of event methodology abnormal returns are estimated. Firstly, excess returns are calculated by deducting risk free rate from raw return. Then we estimate the Capital Asset Pricing Model (CAPM) using country stock market returns as the dependent variable and the world market returns as the independent variable using following equation:

$$R_{itj} = \alpha_{ij} + \beta_{ij}(R_{Dtj}) + \varepsilon_{itj}$$

Where, R_{itj} stands for market return of country i at time t and for event j. R_{Dtj} is the return of world index return for time t and event j. We choose the estimation period to cover the interval of (-120, -11) trading days, relative to event day 0. If event had happened on a non-working day, then the immediate working day following the event is chosen. The beta coefficient from CAPM equation is then used to estimate abnormal return using following equation:

$$AR_{itj} = R_{itj} - \widehat{R_{itj}}$$

Cumulative abnormal return (CAR) was calculated for different event windows. Then we estimated equally weighted average of (ACAR) of cumulative return across all events and

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countries. To account for event induced variance and to estimate our test statistics, we use the standardized abnormal returns method suggested by Boehmer, Masumeci, and Poulsen (1991).

4. Results and Discussion

4.1 Descriptive Statistics

The descriptive statistics of various types of terrorist attacks are reported in table 03. The total assaults that took place during 2001-2017 are 38,083. These terrorist attacks caused 73,984 deaths and 126,814 injuries. The highest numbers of attacks are reported in Pakistan followed by India, Iraq and Philippines. Whereas, the lowest number of assaults of 18 were reported in Brazil. It must be noted that Iraq had highest number of terrorist attacks in whole dataset, but because for the major part of those attacks, Iraq did not had an active stock exchange, therefore, those attacks were not included in the sample dataset. The results are robust with previous findings of Chaudhry et al. (2018), which also ranked Pakistan and India as highly affected by terrorist assaults. It is further reported that highest number of deaths occurred in Iraq (18,051) followed by Pakistan (15031) and India (6210). It implies terrorist incidents were more severe in Iraq than Pakistan and India.

Moreover, terrorist attacks were segregated into six categories based on attack type, target location and target type. In attack type, 1,561 suicide attacks were reported. Whereas, in target location, 4,909 attacks occurred in major cities, 2,670 in capital city, and 3,376 attacks occurred in proximity to the capital. The descriptive stats of target type revealed that 1,455 attacks were on foreign nationals and 15,576 attacks involved damage to property. Furthermore, the correlation matrix is presented in table 04. We reported that assaults are negatively associated with index returns in 23 countries during sample period. The terrorist attacks which were closer to capital city are negatively associated with stock returns and statistically significant at 1% level of significance. Furthermore, the various types of terrorist attacks are positively correlated with each other.

Table 03: Descriptive Statistics

Country	Number of Terrorist Events	Number of Deaths	Number of People Injured	Number of Suicide Attacks	Number of Attacks in Major Cities	Number of Attacks in Capital City	Number of Attacks Closer to Capital	Number of Attacks on Foreign National	Number of Property Damaged
Bangladesh	586	183	704	4	77	204	74	8	223
Brazil	18	7	11	0	7	1	0	1	6
Chile	79	5	37	0	1	45	1	5	61
Colombia	832	605	1201	0	26	31	12	10	416
Egypt	1414	2122	2895	46	126	105	232	27	451
France	273	267	984	6	16	33	16	37	187
Greece	428	72	40	0	64	305	23	49	341
India	5811	6210	11265	39	84	13	25	26	1900
Indonesia	331	313	848	12	20	37	10	13	153
Iraq	5647	18051	29119	538	821	1361	1708	23	1991
Israel	814	683	3263	83	110	74	590	14	303
Mexico	83	130	281	1	7	14	3	2	30
Nigeria	2475	16091	6625	275	512	18	28	102	1233
Pakistan	8907	15031	26311	391	2501	70	285	271	4081
Peru	49	93	144	0	1	6	2	0	15
Philippines	3434	3120	5184	6	160	41	254	58	1184
Russia	1326	2658	4787	64	21	39	10	19	544
Spain	176	237	2265	2	20	27	2	4	124
Sri Lanka	571	1737	3215	33	19	58	47	11	187
Thailand	2492	1558	4424	0	31	106	32	11	1100
Turkey	1292	1536	4814	45	237	37	1	40	552
United Kingdom	724	112	1189	5	21	33	21	711	286
United States	321	3163	17208	11	27	12	0	13	208
Total	**38083**	**73984**	**126814**	**1561**	**4909**	**2670**	**3376**	**1455**	**15576**

Table 04: Correlation Matrix

	Index	Attacks	Suicide	Kill	Major City	Capital City	Capital City Distance	Property Damage	Nationality
Index	1								
Attacks	-0.003	1							
Suicide	-0.004	0.230***	1						
Kill	-0.005	0.275***	0.153***	1					
Major City	-0.002	0.300***	0.227***	0.081***	1				
Capital City	-0.011***	0.308***	0.161***	0.095***	0.020***	1			
Capital City Distance	-0.004	0.327***	0.188***	0.084***	0.133***	0.108***	1		
Property Damage	-0.002	0.408***	0.290***	0.171***	0.252***	0.152***	0.184***	1	
Nationality	-0.001	0.081***	0.054***	0.020***	0.102***	0.072***	0.026***	0.083***	1

4.2 Regression Results

This study examined the relationship between terrorism and index returns through static panel estimation model. For in-depth analysis, the full sample was divided into sub categories such as developing and developed countries in accordance with world bank classification in order to examine the persistency of terrorist attacks across sub sample (developed and developing countries)[5]. Hausman (1978) specification test is applied to choose the most suitable estimation model between fixed and random effect. Results of Hausman test (see table 12 in appendix) support the fixed effect model (The results also holds when random effect is applied). However, we also estimated our model using random effect model for robustness.

In table 05, the regression coefficient of Kill (β = -0.001) for the sample of 23 countries, indicates that stock market returns decline by 0.1% for every additional fatality due to terrorist assaults. However, our analysis reports a higher coefficient value of kill (β = -0.002) in developing countries vis-à-vis full sample, which is significant at 1% level. These results are consistent with the findings of Eldor et al. (2012); Aslam and Kang (2015). These studies established that the higher (lower) intensity of terrorist attacks yield larger (smaller) negative impact on stock returns. In other words, the severity of terrorist assaults determined the economic and financial repercussions of these attacks (Alqahtani et al., 2020; Kong, Xiong, & Xiang, 2021; Zakaria, Jun, & Ahmed, 2019). However, the coefficient is insignificant in developed countries (see table 5). The results are robust with the findings of Kollias et al. (2011) and Arin et al. (2008) who argue that developed markets are less responsive to terrorist assaults vis-à-vis developing economies due to the presence of strong institutional base and market discipline. Moreover, Kollias et al. (2011) observed that London Stock Exchange (LSE) was less reponsive to terrorist assults than Athens Stock Exchange.

Furthermore, the fixed effect regression coefficient of capital city (β = -0.249, see table 5) reveals that equity prices respond negatively by 24.9% to each additional terrorist attack in capital city in full sample. Similarly, the coefficient of this type of terrorist attacks (β = -0.229, see table 5) is also statistically significant at 1 percent in developing countries. It implies that terrorist attacks in capital cities adversely affect index return. Similarly, the coefficient of capital city distance is negative and statistically significant, which reveals that assaults in the proximity of capital city

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[5] For the purpose of robustness, instead of dividing our sample into subsamples of developed and developing countries, we performed interaction of HDI with explanatory variables and the results were in line with our main findings.

have negative effect on capital market performance, consistent with the justification that terrorist target specific locations with strategic advantages such as populated urban area, areas of significant economic activity, and iconic sites in order to grab the media coverage quickly and enable the militants to spread their ideology more easily (Aslam & Kang, 2015; Enders & Sandler, 2006; Li & Schaub, 2004; Marineau et al., 2018; Piazza, 2008). The deadly assaults of Nairobi (September, 2013), in Brussels (May 2014), Paris (November 2015), and Dhaka (July 2016), and Kabul (January 2018) shared the same nature and resulted in abnormal decline in index points. The study of Aslam and Kang (2015), also revealed that index return varies across location. However, our findings are in contradiction with the finding of Eldor and Melnick (2004) who reported that the impact of terrorist attacks doesn't vary across different locations in the financial markets of Israel.

Moreover, the coefficient of victims' nationality (foreign nationals) is negative and statistically significant at 5% level of significance (see table 5). Notably, the coefficient of nationality (β = -0.243) in developing countries is higher than full sample, which shows that equity prices are more sensitive to the assault on foreign nationals in developing countries. The empirical studies of Neumayer and Plümper (2011); Pillar (2001) argued that the foreigners are strategically more valuable targets. For instance, some countries which are largely dependent upon the financial support of foreign countries, may heavily be influenced by terrorist in terms of government's policies and may induce these countries to take immensely unpopular measures, which may in turn results in heightening of the conflict with the domestic terrorists. Hence, terrorist group directly attack the foreign supporter of the home government. The terrorist leadership strive to trigger a decline in foreign support for the home government through terrorist assaults. The overall results are in line with the widely reported negative relationship of terrorism with stock returns around the world (Chaudhry et al., 2018; Corbet et al., 2018; Khan & Ahmed, 2019; MengYun et al., 2018; Narayan et al., 2018; Papakyriakou et al., 2019; Seabra et al., 2020). Similarly, our findings are consistent with the Prospect Theory of Kahneman and Tversky (1979), who provides solid justification for the emotional bias with respect to investors' expectations. They argued that investors generally feel a stronger impulse to avoid losses than to acquire gains which would considerably reduce the market risk premium. Due to this fear of uncertainty, the investor avoids trading specially in the stock markets to avoid future loss and transfer their wealth to other countries (Levy & Galili, 2006).

Table 05: Regression Analysis

Variable	Full sample	Developed countries	Developing countries
L.Index	0.050***	0.033***	0.056***
	(0.003)	(0.005)	(0.004)
Attacks	0.002	-0.105	0.006
	(0.008)	(0.094)	(0.008)
Suicide	-0.035	0.066	-0.030
	(0.063)	(0.202)	(0.069)
Kill	-0.001**	0.000	-0.002***
	(0.000)	(0.000)	(0.001)
Major City	0.049	0.322	0.038
	(0.048)	(0.221)	(0.051)
Capital City	-0.249***	-0.227	-0.229**
	(0.086)	(0.208)	(0.099)
Capital City Distance	-0.124*	-0.215	-0.095
	(0.072)	(0.181)	(0.085)
Property Damage	-0.004	-0.016	0.002
	(0.032)	(0.168)	(0.034)
Nationality	-0.233**	0.269	-0.243**
	(0.103)	(0.221)	(0.121)
Constant	0.031***	0.007	0.043***
	(0.004)	(0.007)	(0.006)
Year Fixed Effect	Yes	Yes	Yes
Observations	103,813	33,720	70,093
R-all	0.00279	0.00143	0.00356
R-between	0.478	0.0101	0.826
R-within	0.00272	0.00144	0.00348
Statistic F	33.98	4.71	34.34

Furthermore, it is worth mentioning that all types of terrorist assaults report an insignificant relationship with stock market returns (see table 05) in case of developed countries. These findings are consistent with the studies of Chen and Siems (2007); Kollias et al. (2011) who argue that negative response of equity prices is determined on basis of stock market's size and maturity. These studies also revealed that developed economies are featured with stable banking/financial sector that provides adequate liquidity to encourage market stability and minimize panic.

Moreover, market participants in developed countries possess higher confidence in the government in taking immediate and right course of action in order to ensure market stability in the aftermath of terrorist attacks.

4.3 Robust Analysis through Event Methodology

Our main analysis confirmed the negative impact of terrorist attacks on stock market; however, for the purpose of robustness we apply event methodology to confirm the consistency and reliability of our main findings. Analysis based on event methodlogy has the ability to study the impact of a phenonmena across short and long term horizons. Furthermore, to assess the short term or long-term effect of terrorist events across subsamples of developed and developing countries and to capture the effect of terrorism on stock return with precision this study has formed 6 event windows based 'day of event', and 'post-event' for each type of terrorist attacks.

Table 06 reports the effect of suicide attacks on market returns based on event methodology. Average Cumulative Abnormal Returns (ACAR) across different time windows are statistically and economically significant in whole sample and developing economies for most of the time windows (see table 06). These results reveal an immediate, long-lived and statistically significant response of stock market to terrorist events across all the windows ranging from trading day to a time window of t+30 (a thirty days window). The results suggest that, on average, the response of international stock markets to terrorism acts in developing countries is immediate but also long-lived as majority of the windows starting on trading day +1 or later is significant with few exceptions. Besides significant, the losses are also persistent as they continue to accumulate without signs of reversal for at least 30 trading days post-event. These results are consistent with the arguments of Eldor and Melnick (2004) that terrorist attacks have long lasting effect on the stock market returns.

Table 06: Analysis of Suicide terrorist attacks

Event Window	Full Sample	Developed	Developing
CAR (0, 1)	-0.106% ***	-0.260% *	-0.084% ***
CAR (0, 2)	-0.069% **	-0.158%	-0.057% **
CAR (0, 5)	-0.192% ***	-0.128%	-0.201% ***
CAR (0, 10)	-0.018% *	-0.304%	0.024%

CAR (0, 15)	0.072%	-0.732% **	0.188%
CAR (0, 30)	0.120% **	-0.275%	0.178% *

Table 7 corresponds to the findings related to terrorist attacks in the major city and its effect on stock market returns. Results indicate that majority of event windows exhibit significant and negative stock market reaction in whole sample. The analysis of sub samples reveals that negative equity response to terrorist assaults in major city is more pronounced in low income countries vis-à-vis developed economies. Further these results reveal the negative relationship between stock returns and terrorist attacks in major city persists over longer time horizon.

Table 07: Analysis of Events in Major City

Event Window	Full Sample		Developed		Developing	
CAR (0, 1)	-0.066%	***	-0.301%	**	-0.052%	**
CAR (0, 2)	-0.054%	**	-0.307%	*	-0.038%	**
CAR (0, 5)	-0.119%	***	-0.127%		-0.119%	***
CAR (0, 10)	-0.186%	***	-0.282%		-0.180%	***
CAR (0, 15)	-0.203%	***	-0.067%		-0.212%	***
CAR (0, 30)	-0.244%	***	0.256%		-0.275%	***

Results in table 08 correspond to how stock market returns respond to terrorist attacks in a capital city. Results reveal a significant negative relationship between abnormal cumulative market returns and terrorist attacks in a capital city. This relationship holds for all event windows in full sample and for developing countries. For developing countries such relationship holds across few time windows and is short lived. Further in table 09 we report results regarding the proximity of terrorist attacks to capital city and its effect on stock market returns. The results reveal a negative and statistically significant relationship across all of the time windows for full sample as well as for the subsample of developing countries. Furthermore, the results indicated that the effect of terrorist activity in the proximity of the capital city on stock returns is immediate and long lasting since this relationship holds for all the time windows which are either equal to or greater than t+5 time horizon. These findings are consistent with the notion that terrorists strive to target areas which are of strategic and economic importance to spread the ideology swiftly through widespread

media presence (Piazza, 2008).For developed countries we report an insignificant relationship for all event windows.

On similar note, table 10 reports the ACAR for event day and post-event day with respect to terrorist activity that involve damage of property. The findings reveal a statistically significant result for most of the time windows. Further the findings confirm that the adverse effect of damage to property due to terrorist attacks is more prevalent in developing countries as compared to the developed countries as it can be observed that all event windows of ACAR are statistically and economically significant for developing countries (see table 10). These results are consistent with the findings of Orbaneja, Iyer, and Simkins (2018), who reported a negative crude oil prices' response to the terrorist attacks on oil infrastructure.

Table 08: Analysis of Events in Capital City

Event Window	Full Sample		Developed		Developing	
CAR (0, 1)	-0.171%	***	-0.631%	***	-0.114%	**
CAR (0, 2)	-0.193%	***	-0.663%	***	-0.135%	***
CAR (0, 5)	-0.207%	***	-0.489%	*	-0.172%	***
CAR (0, 10)	-0.403%	***	-0.869%	**	-0.345%	***
CAR (0, 15)	-0.507%	***	-0.499%		-0.508%	***
CAR (0, 30)	-0.649%	***	-0.542%		-0.663%	***

Table 09: Analysis of Events within 100 KM radius of Capital City

Event Window	Full Sample		Developed		Developing	
CAR (0, 1)	-0.054%	***	-0.108%		-0.047%	**
CAR (0, 2)	-0.033%	**	0.067%		-0.047%	**
CAR (0, 5)	-0.082%	***	0.162%		-0.115%	***
CAR (0, 10)	-0.168%	***	0.346%		-0.238%	***
CAR (0, 15)	-0.206%	***	-0.118%		-0.218%	***
CAR (0, 30)	-0.484%	***	0.106%		-0.564%	***

Table 10: Analysis of Terrorist attacks that damaged the property

Event Window	Full Sample		Developed		Developing	
CAR (0, 1)	-0.037%	***	-0.223%	**	-0.020%	**
CAR (0, 2)	-0.043%	***	-0.211%		-0.027%	**
CAR (0, 5)	-0.060%	***	-0.114%		-0.055%	***
CAR (0, 10)	-0.067%	***	-0.357%	*	-0.039%	***
CAR (0, 15)	-0.095%	***	-0.471%	**	-0.060%	***
CAR (0, 30)	-0.196%	***	-0.798%	***	-0.139%	***

Table 11 reveals a weak relationship between terrorist attacks on foreign nationals and stock market returns for developed countries. Ironically, the post event windows such as [0, +30] have statistically significant, negative CAR values and its significance level barely made the 0.10 cutoff, revealing a weak long-lived response of Average Cumulative Abnormal Returns to terrorist attack on foreign nationals in developed countries (see table 11). This adverse effect of terrorist attacks on foreign nationals is attributed to the fact that foreign nationals are strategically more important and by targeting foreign national terrorist can achieve significant political influence which have drastic political and social implications for the home country. These findings are in consistency with rational theory of terrorism which argues that foreign national are significant targets of terrorist groups to create sociopolitical instability which in turn hampers economic growth (Pillar, 2001; Crenshaw, 2000).

Table 11: Analysis of Terrorist attacks on Foreign Nationals

Event Window	Full Sample	Developed		Developing
CAR (0, 1)	0.045%	0.225%		0.013%
CAR (0, 2)	0.157%	0.364%		0.120%
CAR (0, 5)	0.189%	0.320%		0.166%
CAR (0, 10)	0.253%	0.212%		0.260%
CAR (0, 15)	0.223%	0.008%		0.261%
CAR (0, 30)	0.311%	-0.906%	*	0.523%

Our overall findings reveal a heterogeneous response of stock market returns to different types of terrorist attacks across developing and developed countries (Aslam et al., 2015). Different types of terrorist attack such as suicide bombings, attacks on strategic location and properties, attacks on foreign nationals and attacks on major cities and capital cities negatively affect the stock markets. This effect is more pronounced in developing countries as compared to developed countries. Our findings are supported by various research studies. Our findings reveal that terrorist attack location and type of terrorist attacks were important contributors to negative shocks in stock market returns in line with Hassan and Hashmi (2015). On a similar note, Aslam and Kang (2013) argue that strategic importance of the terrorism affected location and the targeted people were significant attributes which hamper the stock market performance of a country.

Our robust analysis validates our main findings that developed markets are more resilient to terrorist attacks in line with the findings of Papakyriakou et al., (2019). Further we report that stock markets in developed countries are not only resilient to terrorist attacks but also stock markets in developed countries recover speedily from the adverse effects of terrorist assaults than developing countries. This resilience can be attributed to the fact that developed countries have sophisticated financial and banking sector which can easily inject liquidity into financial markets of developed countries to quash away the negative shocks that result from terrorist assaults (Brounen & Derwall, 2010). While, higher sensitivity of market returns to different types of terrorist assaults can be attributed to the fact that developing countries are characterized by weak and volatile financial markets, and also lack the capacity to inject liquidity to financial markets in turbulent time caused

by terrorist activities (Enders & Sander, 2006). Thus, stock market returns vary heterogeneously in response to terrorist attacks across developing and developed countries which is in line with the findings of Arin et al. (2008) and in contradiction with the findings of several studies such as Goel et al. (2017); Essaddam and Mnasri(2015); and Chesney et al. (2011).

5. Conclusion

This study examines the impact of terrorism on index return of 23 countries through static panel estimation model. This study also analyzed the persistence in the mispricing of securities in capital market caused by terrorist assaults across sub samples of developed and developing countries.

Our results reveal that the impact of terrorist attacks varies across the severity of attacks. Terrorist attacks of higher intensity and causing significant strategic human, physical and damage, rendered greater adverse effects over the stock market returns than less sever assaults. Consistent with previous literature, our results suggest that terrorist assaults in capital city and in close proximity of capital city hamper the performance of capital markets. In line with notion that foreign nationals have greater strategic value, the negative reaction of equity prices has been found due to the terrorist assaults on the foreign nationals in full sample as well as in the sub samples (developing countries). However, the results suggested that developed capital markets are resilient to all stated categories of terrorist assaults. The resilience is attributed to the presence of strong financial institutional which provides sufficient liquidity to stock market and thus hinder panic selling. Our robust analysis through event study methodology suggest that stock market performance greatly deteriorates due to terrorist attacks and this negative effect is more distinct on event day and the economic losses persist along subsequent trading days after the terrorist assaults. This continuous decline in stock market performance subsides gradually and trend reversion usually takes up to 30 trading days in the aftermath of terrorist assaults in our subsample of developing countries. The same reversal of stock market performance take place more speedily in developed markets compared to developing markets.

Our findings have multifaceted implications for investors, governments and policy makers of different funds management companies in the context of portfolio diversification, secure trading and national security planning. Our study posits important implications for the investors in managing their portfolio as we report on the heterogeneous response of stock market returns to different tactics adopted by terrorist groups such as type of terrorist attack, location of terrorist

attacks and number of causalities. Further in developing countries the the impact of terrorist attacks on stock market did not lasts for more than 30 days. While in developed countries this impact lasts longer. In line with this finding, investors can plan and manage their holding period of investment in capital markets.

Moreover terrorist attacks on capital cities and cities in close proximity have significant effect on stock market returns, thus governments should ensure the security of such cities for a stable investment environment for investors. Government can use the findings of this study to formulate anti-terrorism policies that will lessen the effects of terrorist assaults.

Keeping aside the reliability and relevance of this study we acknowledge that these findings are put forward with some limitations. First for more rigorous insight future studies can adopt numerous other proxies of terrorist activities and explore the casual link of these proxies with other economic indicators within the context of UN sustainable development goals (UN-SDGs). Secondly, future studies can extend our analysis to a broader dataset by including more countries from developing, emerging and developed countries to provide a global insight to economic planners, investors, funds' managers and other relevant stakeholders. Our analysis may be applied across different sectors and industries to grasp micro level comprehension on how different sectors, industries and markets behave to different types of terrorist assaults.

References

Abadie, A., & Gardeazabal, J. (2003). The economic costs of conflict: A case study of the Basque Country. *American economic review, 93*(1), 113-132.

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

Aksoy, M. (2014). The effects of terrorism on Turkish stock market. *Ege Akademik Bakış Dergisi, 14*(1), 31-41.

Alqahtani, A., Bouri, E., & Vo, X. V. (2020). Predictability of GCC stock returns: The role of geopolitical risk and crude oil returns. *Economic Analysis and Policy, 68*(01), 239-249.

Arin, K. P., Ciferri, D., & Spagnolo, N. (2008). The price of terror: The effects of terrorism on stock market returns and volatility. Economics Letters, 101(3), 164-167.

Arto, I., Capellán-Pérez, I., Lago, R., Bueno, G., & Bermejo, R. (2016). The energy requirements of a developed world. *Energy for Sustainable Development, 33*, 1-13.

Aslam, F., & Kang, H.-G. (2015). How different terrorist attacks affect stock markets. *Defence and Peace Economics, 26*(6), 634-648.

Bevilacqua, M., Morelli, D., & Uzan, P. S. R. (2019). Asymmetric implied market volatility and terrorist attacks. *International Review of Financial Analysis*, 101417.

Blomberg, S. B., & Hess, G. D. (2008). From (no) butter to guns? Understanding the economic role in transnational terrorism. *Terrorism, economic development, and political openness*, 83-115.

Blomberg, S. B., & Mody, A. (2005). How severely does violence deter international investment? *Claremont Colleges Economics Departments Working Paper*(2005-01).

Blomberg, S. B., Hess, G. D., & Orphanides, A. (2004). The macroeconomic consequences of terrorism. *Journal of Monetary Economics, 51*(5), 1007-1032.

Brockhoff, S., Krieger, T., & Meierrieks, D. (2015). Great expectations and hard times: The (nontrivial) impact of education on domestic terrorism. *Journal of Conflict Resolution*, 59(7), 1186-1215

Brounen, D., & Derwall, J. (2010). The impact of terrorist attacks on international stock markets. *European Financial Management, 16*(4), 585-598.

Charles, A., & Darné, O. (2006). Large shocks and the September 11th terrorist attacks on international stock markets. Economic *Modelling, 23*(4), 683-698.

Chaudhry, N., Roubaud, D., Akhter, W., & Shahbaz, M. (2018). Impact of terrorism on stock markets: Empirical evidence from the SAARC region. *Finance Research Letters, 26*, 230-234.

Chen, A. H., & Siems, T. F. (2007). The effects of terrorism on global capital markets *The Economic Analysis of Terrorism* (pp. 99-122): Routledge.

Chesney, M., Reshetar, G., & Karaman, M. (2011). The impact of terrorism on financial markets: An empirical study. *Journal of Banking & Finance, 35*(2), 253-267.

Çınar, M. (2017). The effects of terrorism on economic growth: Panel data approach. *Zbornik radova Ekonomskog fakulteta u Rijeci: časopis za ekonomsku teoriju i praksu/Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business, 35*(1), 97-121.

Corbet, S., Gurdgiev, C., & Meegan, A. (2018). Long-term stock market volatility and the influence of terrorist attacks in Europe. *The Quarterly Review of Economics and Finance, 68*, 118-131.

Crain, N. V., & Crain, W. M. (2006). Terrorized economies. *Public Choice, 128*(1-2), 317-349.

Crenshaw, M. (1981). The causes of terrorism. *Comparative politics, 13*(4), 379-399.

Crenshaw, M. (2001). Counterterrorism policy and the political process. *Studies in conflict and terrorism, 24*(5), 329-337.

Drakos, K. (2010). Terrorism activity, investor sentiment, and stock returns. *Review of financial economics, 19*(3), 128-135.

Durodie, Bill. "Securitising education to prevent terrorism or losing direction?." *British Journal of Educational Studies* 64.1 (2016): 21-35.

Eckstein, Z., & Tsiddon, D. (2004). Macroeconomic consequences of terror: theory and the case of Israel. *Journal of Monetary Economics, 51*(5), 971-1002.

El Ouadghiri, I., & Peillex, J. (2018). Public attention to "Islamic terrorism" and stock market returns. *Journal of Comparative Economics, 46*(4), 936-946.

Eldor, R. R., Hauser, S., Kroll, Y., & Shoukair, S. (2012). Financial markets and terrorism: The perspective of the two sides of the conflict. *Journal of Business Administration Research, 1*, 18-29.

Eldor, R., & Melnick, R. (2004). Financial markets and terrorism. *European Journal of Political Economy, 20*(2), 367-386.

Enders, W., & Sandler, T. (1996). Terrorism and foreign direct investment in Spain and Greece. *Kyklos, 49*(3), 331-352.

Enders, W., & Sandler, T. (2006). Distribution of transnational terrorism among countries by income class and geography after 9/11. *International Studies Quarterly, 50*(2), 367-393.

Eruygur, A. Ç., & Omay, T. (2014). Terrorism and the stock market: a case study for Turkey using STR models. *Journal of Reviews on Global Economics, 3*, 220-227.

Estrada, M. A. R., Park, D., Kim, J. S., & Khan, A. (2015). The economic impact of terrorism: a new model and its application to Pakistan. *Journal of Policy Modeling*, 37(6), 1065-1080.

Frey, B. S., Luechinger, S., & Stutzer, A. (2007). Calculating tragedy: Assessing the costs of terrorism. *Journal of Economic Surveys, 21*(1), 1-24.

Goel, S., Cagle, S., & Shawky, H. (2017). How vulnerable are international financial markets to terrorism? An empirical study based on terrorist incidents worldwide. *Journal of Financial Stability, 33*, 120-132.

Gok, I. Y., Demirdogen, Y., & Topuz, S. (2020). The impacts of terrorism on Turkish equity market: An investigation using intraday data. *Physica A: Statistical Mechanics and its Applications, 540*, 123484.

Hobbs, J., Schaupp, L. C., & Gingrich, J. (2015). Terrorism, militarism, and stock returns. *Journal of Financial Crime, 23,*(01), 70-86.

Hussain, S., Shah, S. M. A., & Ahmad, T. (2017). Systematic Risk and Socio-Political Factors: The Case of Pakistan Stock Exchange. *International Journal of Multidisciplinary and Current Research, 5*.

Johnston, R. B., & Nedelescu, O. M. (2005). IMF Working paper: The Impact of Terrorism on Financial Markets: IMF WP/05/60.

Khan, M., & Ahmed, T. (2019). Terrorism, military operations and farmer's income in Waziristan (Pakistan). *Journal of Policy Modeling, 41*(4), 623-635.

Koknar, A. M. (2009). The epidemic of energy terrorism. *Gal Luft ve Anne Korina (Der.), Energy Security Challenges for the 21st Century: A Reference Handbook, California, Praeger*, 23-27.

Kolaric, S., & Schiereck, D. (2016). Are stock markets efficient in the face of fear? Evidence from the terrorist attacks in Paris and Brussels. *Finance Research Letters, 18*, 306-310.

Kollias, C., Manou, E., Papadamou, S., & Stagiannis, A. (2011). Stock markets and terrorist attacks: Comparative evidence from a large and a small capitalization market. *European Journal of Political Economy, 27*, S64-S77.

Kong, D., Xiong, M., & Xiang, J. (2021). Terrorist attacks and energy firms' crash risk in stock markets: Evidence from China. *Energy Economics, 102*(1088-1100), 105474.

Kydd, A. H., & Walter, B. F. (2006). The strategies of terrorism. *International security, 31*(1), 49-80.

Levy, O., & Galili, I. (2006). Terror and trade of individual investors. *The Journal of Socio-Economics, 35*(6), 980-991.

Li, Q., & Schaub, D. (2004). Economic globalization and transnational terrorism: A pooled time-series analysis. *Journal of conflict resolution, 48*(2), 230-258.

Llussá, F., & Tavares, J. (2011). Which terror at which cost? On the economic consequences of terrorist attacks. *Economics Letters, 110*(1), 52-55.

Lutz, B. J., & Lutz, J. M. (2020). Terrorism and tourism in the Caribbean: a regional analysis. *Behavioral Sciences of Terrorism and Political Aggression, 12*(1), 55-71.

Makarenko, T. (2004). The crime-terror continuum: tracing the interplay between transnational organised crime and terrorism. *Global crime, 6*(1), 129-145.

Marineau, J., Pascoe, H., Braithwaite, A., Findley, M., & Young, J. (2018). The local geography of transnational terrorism. *Conflict Management and Peace Science*, 0738894218789356.

Meierrieks, D., & Schneider, F. (2021). Terrorism and international economic policy. *European Journal of Political Economy, 69*(01), 01-15.

MengYun, W., Imran, M., Zakaria, M., Linrong, Z., Farooq, M. U., & Muhammad, S. K. (2018). Impact of terrorism and political instability on equity premium: Evidence from Pakistan. *Physica A: Statistical Mechanics and its Applications, 492*, 1753-1762.

Mnasri, A., & Nechi, S. (2016). Impact of terrorist attacks on stock market volatility in emerging markets. *Emerging Markets Review, 28*, 184-202.

Narayan, S., Le, T.-H., & Sriananthakumar, S. (2018). The influence of terrorism risk on stock market integration: Evidence from eight OECD countries. *International Review of Financial Analysis, 58*, 247-259.

Neumayer, E., & Plümper, T. (2011). Foreign terror on Americans. *Journal of Peace Research, 48*(1), 3-17.

Nguyen, A. P., & Enomoto, C. E. (2009). Acts of terrorism and their impacts on stock index returns and volatility: The cases of the Karachi and Tehran stock exchanges. *International Business & Economics Research Journal (IBER), 8*(12).

Nikkinen, J., & Vähämaa, S. (2010). Terrorism and stock market sentiment. *Financial Review, 45*(2), 263-275.

Orbaneja, J. R. V., Iyer, S. R., & Simkins, B. J. (2018). Terrorism and oil markets: A cross-sectional evaluation. *Finance Research Letters, 24*, 42-48.

Papakyriakou, P., Sakkas, A., & Taoushianis, Z. (2019). The impact of terrorist attacks in G7 countries on international stock markets and the role of investor sentiment. *Journal of International Financial Markets, Institutions and Money, 61*, 143-160.

Pape, R. A. (2003). The strategic logic of suicide terrorism. *American political science review, 97*(3), 343-361.

Peleg, K., Regens, J. L., Gunter, J. T., & Jaffe, D. H. (2011). The normalisation of terror: the response of Israel's stock market to long periods of terrorism. *Disasters, 35*(1), 268-283.

Piazza, J. A. (2008). Incubators of terror: Do failed and failing states promote transnational terrorism? *International Studies Quarterly, 52*(3), 469-488.

Pillar, P. R. (2001). Terrorism goes global: Extremist groups extend their reach worldwide. *The Brookings Review, 19*(4), 34-37.

Plümper, T., & Neumayer, E. (2010). The friend of my enemy is my enemy: International alliances and international terrorism. *European Journal of Political Research, 49*(1), 75-96.

Seabra, C., Reis, P., & Abrantes, J. L. (2020). The influence of terrorism in tourism arrivals: A longitudinal approach in a Mediterranean country. *Annals of Tourism Research, 80*, 102811.

Tversky, A., & Kahneman, D. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47*(2), 263-291.

Walkenhorst, P., & Dihel, N. (2002). *Trade impacts of the terrorist attacks of 11 September 2001: a quantitative assessment.* Paper presented at the workshop on the economic consequences of global terrorism, Berlin.

Zakaria, M., Jun, W., & Ahmed, H. (2019). Effect of terrorism on economic growth in Pakistan: an empirical analysis. *Economic research-Ekonomska istraživanja,32*(1), 1794-1812.

Appendix

Table 12 Results of Hausman Test

Test Summary	Chi-Sq. Statistics	Chi-Sq. d.f.	Prob.
Cross-section random	38.67	9	0.000

Table 13 Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Description	Values
chi2(1)	13461.22
Prob > chi2	0.0000

Table 14: Regression Analysis

Variable	Full sample	Developed countries	Developing countries
L.Index	0.044***	0.018***	0.061***
	(0.003)	(0.004)	(0.004)
Attacks	0.001	-0.048	0.005
	(0.008)	(0.047)	(0.008)
Suicide	-0.025	-0.056	0.006
	(0.062)	(0.140)	(0.070)
Kill	-0.001**	-0.000	-0.002***
	(0.000)	(0.000)	(0.001)
Major City	0.045	0.074	0.043
	(0.048)	(0.183)	(0.050)
Capital City	-0.259***	-0.300*	-0.228**
	(0.086)	(0.165)	(0.098)
Capital City Distance	-0.094	-0.134	-0.057
	(0.071)	(0.146)	(0.083)
Property Damage	-0.003	-0.016	0.008
	(0.032)	(0.096)	(0.034)
Nationality	-0.220**	0.242	-0.225*
	(0.099)	(0.180)	(0.117)
Constant	0.025***	0.012**	0.037***
	(0.004)	(0.005)	(0.005)
Year Fixed Effect	Yes	Yes	Yes
Observations	144,293	67,292	72,242

Table 13 presents the results of 30 countries. In addition to countries mentioned in table 1, Germany, Italy, Japan, Malaysia, South Africa, Australia and China are also included