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Terrorism and Financial Markets: Evidence from SAARC Countries

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Abstract

While a lot of research works have been devoted on assessing the impact of terrorism on stock markets, little has been done to identify its influence on the forex markets. The study reinvestigates the conviction of undermining the effects of terrorism on foreign exchange and stock markets by analyzing data of SAARC countries. By employing the event study methodology and panel regression model, the finding reveals that the effect on foreign exchange markets is more intense than the stock markets, though the effect varies with the type of terrorist attacks. The bombing-type is a major attack that exerts a negative effect on both the markets. Further, the after-effect shocks are more pronounced and significant in foreign exchange markets. The results provide policy implications for regulators, investors, and policymakers.

Key Words: *Terrorism, Exchange Rate, Stock Market, SAARC.*

Introduction

The worldwide political uncertainty and disruptions driven by the terror attacks have been an intriguing issue to investigate. Despite the common notion that terrorist incidents adversely affect the economic indicators (trade, investments, financial markets), the policymakers and academicians have devoted much less attention to the impact of terror attacks on financial markets. The existing literature on the subject explores limited terror events, for example, the 9/11 US terror act, the 11/13 Paris attack, 3/4 Madrid, and 7/7 London bombing attacks. Further, most of the studies use traditional methodologies ignoring the Asian emerging economies. Moreover, the studies provide mixed results focusing more on the stock markets while ignoring the most liquid and largest financial market, i.e. foreign exchange market.

Since the 9/11 incident, Asian countries have been suffering from multiple master-planned terror attacks that have drastically influenced the economy as a whole.[1] Approximately, 40% of total terror attacks are

[1](Ahmar, 2015).

reported in South Asia and South-East Asia in 2017, which is the highest number followed by the Middle East and North African countries.[2] Afghanistan is the most severely affected countries whereas Pakistan and India are ranked 7th and 8th on the Global Terrorism Index (2020), respectively. Terrorism creates higher uncertainty, increased expenditure and costs, lower industrial output, and reduced level of foreign investments[3] in South Asian regional countries. Chaudhry et al., (2018) confirm the significant negative impact of attack day on stock market returns in high and less affected countries of SAARC.

Concerning the influence of terror attacks on macroeconomic indicators, the terror incidents result in descending trade, tourism, foreign direct investment (FDI), and an assessment of economic and market expectations thus lowering the demand for currency in the affected region. Blomberg et al., (2004) and Gaibulloev & Sandler, (2008) report that terrorism deteriorates growth prospects triggering a decrease in GDP and investments while increasing government spending. This raise in government spending leads to an appreciation in the exchange rate. In a similar vein, Balcilar et al., (2017) explain that according to the exchange rate monetary model, terror attacks exert a negative influence on consumption and output causing the exchange rate to depreciate. They find that terror attacks affect all quantiles of the conditional distribution of exchange rate volatility. The other channel through which terrorism impacts the exchange rate is international trade flows (Eckstein and Tsiddon, 2004; Nitsch & Schumacher, 2004; Pham & Doucouliagos, 2017). They find that terrorism adversely affects trade and exports for the sample of Israel and multiple countries. Consequently, frictional trading and insurance costs rise with tighter security impositions. Moreover, Bensassi and Martinez (2012) and Burlando et al., (2015) find the negative effect of hijackings on international maritime trade. Abadie & Gardeazabal, (2008) develop a regression model to understand the terror attacks-international capital flows nexus. They argue that terrorism changes the expected return on investments that ultimately follow heightened international capital flows. They assert that low-risk-averse investors in the affected country abruptly change their international investment decisions with a change in the expected return on investments. This capital reallocation is larger in case of higher integration among international capital markets.

The terror-based volatility contagions among international financial markets drive sharp fluctuations in the exchange rate. The evidence is supported by Hon et al (2004), who find strong correlations among international stock markets during the incident of September 11. Soriano et al., (2009) confirm the bidirectional stock market volatility spillover between the US and European Markets. Particularly, the US attack of September 11 affected the European stock market, however, the US market is unaffected by the London (March 11, 2004) and Madrid (July 7 2005) terror attacks. Hassapis et al., (2019) examine the impact of Eurozone terror incidents on the price of Euro using regression and event study methods. The study concludes that 9/11, and 7/7 incidents caused negative returns on the event day in the foreign exchange market. Maitah et al., (2017) authenticate that the influence of terror attacks in Turkey causes a small negative change in Turkish currency in the short and long run. Narayan et al., (2018) further documents varying degrees of reactions of currencies to terrorist attacks. Furthermore, Schneider et al., (2015) contemplate that frequent incidents of terror in a country restrict the inflows of external country resources.

Numerous studies address the impact of terror attacks on stock markets taking into account the common and known terror incidents. Chen & Siems, (2004) find that capital markets in the US have become resilient eventually offsetting the consequences of incidents. Johnston and Nedelescu (2005) scrutinize

[2] See, Table A-1 in the appendix.

[3] (Shah & Faiz, 2015).

the effect of 9/11 and 3/4 on the markets and point that markets are severely affected by the direct and indirect costs particularly the adverse effects of 9/11 are substantial. Further, Arin et al., (2008) analyze the effect of terror acts on the financial markets of the UK, Thailand, Spain, Turkey, Israel and Indonesia. They report that the intensity of the effects is stronger in emerging markets. Baumert (2009) focuses on the effect of 9/11, London, and Madrid bombing incidents on the stock markets of Japan, Europe, and the US. They conclude that the magnitude of the effect and duration lessens overtime due to investors' rationality in measuring risks associated with the events. Similarly, Kollias et al., (2011) investigate the effect of London and Madrid bombing attacks on equity sectors substantiating abnormally negative returns across sectors in Spain. However, the effect is not evident for the British markets. Markoulis, (2021) study the effect of major attacks in the 21st century on international stock markets. They find that negative returns are higher in the case of earlier incidents as compared to the recent incidents. Further, the researchers note that the negative returns persevere beyond the event dates but disappear swiftly. Moreover, Papakyriakou et al., (2019) examine the influence of terror attacks in G7 countries on stock markets of 66 economies. They find that the markets significantly decline on the event day and the next day following to the event.

Finally, the interrelation of stock and foreign exchange markets is imperative since the changes in the security markets have a greater impact on the currency throughout the diverse periods (Chkili & Nguyen, 2014). The positive and negative effect in one market is contagious and transferred to another market which signifies important economic and policy implications on international capital budgeting decisions. Liu & Wan, (2012) find a unidirectional relationship from exchange rates to stock price fluctuations. On the other side, Yang, (2004) conclude that stock price fluctuations exert pressure on currency volatility and signal information regarding the foreign exchange markets. Moreover, Pan et al., (2007) and Walid et al., (2011) find a positive bidirectional association between stock and foreign exchange markets. In addition, Lin, (2012) shows significant co-movement between stock price and exchange rate in Asian emerging economies during crises period. Furthermore, Park & Newaz, (2018) analyze the effect of various terror attacks on stock and foreign exchange markets of 36 economies. The findings reveal the negligible impact on stock markets and a slight effect on foreign exchange markets.

This study extends the work of Chaudhry et al., (2018) and re-examines the impact of terrorism on both foreign exchange and stock markets simultaneously in SAARC countries. Our study contributes in several ways. First, the study investigates the effect of terror incidents on stock and foreign exchange markets, concurrently. The significant interrelation between both the markets intrigues to examine whether the extent and nature of shocks are relatively the same. Second, since a large number of incidences of different types of terrorism are reported in SAARC countries over time, thus the study presents empirical evidence of the SAARC region assessing the response of high and low affected countries using a more recent dataset. Third, the findings reveal that the effect on foreign exchange markets is more intense than the stock markets in the SAARC region, though the effect varies with the type of terrorist attacks. Moreover, the bombing-type is a major attack that has unfavorable effects on both financial markets. Further, the after-effect shocks are more pronounced in foreign exchange markets than in stock markets. The rest of the paper is organized as follows. Section 2 discusses the methodology and estimation techniques. Section 3 describes the data and variables and presents the empirical analysis and discussion of results. Section 4 proceeds with the conclusion and implications of the study.

Literature Review

While considering the disruptions and uncertainty based on the geopolitical in various parts of terrorism affected countries, different empirical studies have been conducted to explore the influence of terrorism

on the Forex markets (Chesnay, Reshetar, & Karaman, 2011; Qaiser, Sohail, Liaqat, & Mumtaz, 2012). Similarly, in the majority of the studies, the researchers have attempted to establish the relationship of terrorism with stock markets. However, scant attention has been given to determining the influence of terrorism on both markets (Forex and stock markets) simultaneously. It is witnessed that terrorism and measures to counter it, do greatly affect economic indicators such as exchange rate, stock markets, and investments (Chen & Siems, 2004; Qaiser et al., 2012). From an economic perspective, the consequence of terrorism are explored, and concluded that the forex market and measures of the macroeconomic indicator have more volatile effects (Eckstein & Tsiddon, 2004b). Similarly, the negative results and unexpected random walk of the currency exchange rate are witnessed in another study (Mussa, 1979). Furthermore, non-parametric and non-linear models examined to measure the fluctuations of currency concluded with a negative result (Balcilar et al., 2017a).

Due to uncertainty, the country's economy destabilizes which affects the discount rate negatively. Moreover, the discount rate is reported to be indirectly proportional to appreciation (depreciation – opposite) of the exchange rate (Smirlock & Yawitz, 1985). Similarly, if the error-driven news is released from any of the specific-country, it would trigger volatility in financial markets. Besides that, media speculation also influences by putting politically unstable news due to terrorism (Calvo & Mendoza, 2000; Hons, Strauss, & Yong, 2004).

Moreover, in the context of the exchange rate-stock market nexus, numerous studies shed light on the relationship under two theoretical explanations. The first is the flow-oriented model which states that depreciation of local currency raises the exports and cash flows of the domestic industry which then leads to the increase in the stock prices (Dornbusch & Fischer, 1980). Liu and Wan (2012) find that a unidirectional relationship and shocks are observed from exchange rates to stock price fluctuations. The second is the portfolio balance/ stock-oriented model that directs the transmission effect from stock prices to exchange rates and explains that adjustments in exchange rate occur due to the changes in the local and foreign stock trading in international diversified investment (Frankel, 1992). Yang and Doong (2004) conclude that stock price fluctuations exert pressure on currency volatility and contain information regarding the foreign exchange markets. Pan, Fok, & Liu (2007) and Walid, Chaker, Masood, and Fry (2011) find that bidirectional positive associations between stock and foreign exchange markets are positively linked. Lin (2012) shows significant co-movement between stock price and exchange rate in Asian emerging economies during economic turbulent and crises period. This study investigates similar research questions to determine whether there is a similar significant shock observed in both forex and stock market with the terror attacks or not.

It is witnessed in previous literature (Mussa, 1979; Abadie & Gardeazabal, 2003a; Chen & Siems, 2004; Eckstein & Tsiddon, 2004b; Eldor & Melnick, 2004; Nitsch & Schumacher, 2004; Brounen & Derwall, 2010; Chesnay et al., 2011; Balcilar et al., 2016a) that terrorism has a great influence on financial markets, international trade, and economic stability. The effect of terrorist activities-related news is also witnessed in different studies (Walkenhorst & Dihel, 2002; Charles & Darne, 2006; Arin, Ciferri, & Spagnolo, 2008; Balcilar et al., 2016a). This study focuses on studying terrorist events and their impact on the exchange rate and stock market return. Besides, to what extent the effect on stock return would occur due to terrorist activities would be investigated in this study. Going through the literature review, it is found that very little research has been conducted on this topic especially, in the context of Asian developing regions (Maitah et al., 2017; Chaudhry, Roubaud, Akhter, & Shahbaz, 2018).

Material and Methods

The study collected three types of data: the exchange-rate return (the returns of the home country exchange rate relative to the U.S dollar, Home/USD currency) the stock indices of SAARC countries, and terrorist attack news. The study extracted daily exchange rates and stock return data of 18 years (2000-2017). The first-differenced of the natural log of exchange-rate and stock market returns are taken into account with the data extracted from the Thomson Reuter DataStream Database. Daily exchange rate and stock returns are dependent variables and terrorist attacks and their types are the independent variables. The details of terrorist events were collected from the Global Terrorism Database website (GTD 2019). The study uses stratified sampling following Chaudhry et al. (2018). The panel regression method is applied to determine the relationship between terrorism, exchange rate, and stock returns. The sample countries are Afghanistan Pakistan, India, Bangladesh, Sri Lanka, Bhutan, Maldives, and Nepal. The study makes use of two different sample data for separate analysis. First, to determine the combined effect of terrorism on both the stock exchange and exchange rate, the study considers the following four countries from the SAARC region in our study: Pakistan, India, Bangladesh, and Sri Lanka. However, to check the separate effect of terrorism on the exchange rate, the study considers all SAARC countries: Afghanistan Pakistan, India, Bangladesh, Sri Lanka, Bhutan, Maldives, and Nepal. It is done due to two main reasons. First, these countries are reported to have high-frequency terrorist events. And secondly due to the unavailability of stock market data in some countries (Afghanistan, Maldives, Bhutan, Nepal). For instance, Afghan financial markets are experiencing a transition phase due to war and fragile economic setup. Moreover, the Maldives and Bhutan can not be considered in this study because these countries had only 23 and 6 terrorist attacks, respectively between 2000 and 2017, and therefore can not be compared with countries having the high- frequency of Terrorist events. Finally, Nepal is excluded from sample due to unavailability of data related to stock market.

Political-related news data is taken from multiple sources including Bloomberg and various websites.[4] Data related to budget news have been taken from the Central banks' websites of each country; Reserve bank of India, State bank of Pakistan, Da Afghanistan Bank, Royal monetary authority of Bhutan, Maldives Monetary Authority, Central bank of Sri Lanka, Bangladesh Bank, Nepal Rastra Bank.

Table 1: Total number of events in Sample countries

Sample Period	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka
2000-2013	5824	351	5	5183	7	827	7574	789
2014-2017	6783	728	1	3735	16	346	4977	70
Total	12607	1079	6	8918	23	1173	12551	859

Table 1 shows the total number of terror events that occurred in each country of the Sample from 2000 to 2017.

The study estimates the separate effect of the exchange rate on all sample countries. It is evident that all SAARC countries have suffered from terrorism, especially after the 9/11 attacks (Ahmer, 2015). Table 1 depicts the total number of terror events occurred in each country of the Sample from 2000 to 2017. Afghanistan received the largest number of terrorist attacks in this timeframe (total incidents reported were 12607, see Table 1).

[4] https://www.cnbc.com/asia-politics/, https://www.bloombergquint.com/, https://economictimes.indiatimes.com/

The event study methodology is applied following Corrado (2011) to examine the impact of the terrorist attack on exchange rates and stock market return. Duration is subcategorized into three segments i) pre-event, ii) day of the event, and iii) post-event. Thus, this study captures the effect of significant terrorist activities by investigating the single-day exchange rate and stock market returns from 'day − 1' to 'day + 1' of the terrorist attack following Chaudhry, Roubaud, Akhter, & Shahbaz (2018). With event study methodology, data related to stock returns and exchange rates are constructed on an event basis, one day/week before and after the discussed event to anticipate the extent of volatility in the exchange rate and market returns.

This present study is designed to investigate the dependency of the exchange rate and stock market return on terrorist activities. To observe fluctuations occurring in the currency exchange and stock market due to terrorist activity, data of seven days (one day/week) is taken, (daily-1, 0, 1/ weekly, -7, 0, 7). Terrorism activities are measured on the dates when the event occurs.
As per the below equations, the impact is examined of the terror attack on the exchange rate and stock return.

$$\mathrm{Ex}_{it} = \alpha + \beta_1 TA_t + \beta_2 \text{Political news}_t + \beta_3 \text{Budget news}_t + \epsilon_i \text{ (1)}$$
$$Re_{it} = \alpha + \beta_1 \mathrm{TA}_t + \beta_2 \text{Political news}_t + \beta_3 \text{Budget news}_t + \epsilon_i \text{ (2)}$$

Where, Ex stands for exchange rate (home to USD), TA is terrorism activities (Terror Attack t= 1 if there is any terrorist attack on day t; and 0 otherwise.), Political news= 1 if there is any political change on day t; and 0 otherwise, Budget news= 1 if there is any budget news on day t; and 0 otherwise and Re stands for Stock Return. α & β= are parameters to be anticipated and e_i is a random error.

Following Chaudhry et al. (2018), the study divides terrorist attacks into four types i.e, Bombing, Armed Assault, assassination, hostage-taking. Dummy is assigned as 1 if type I of terrorist attack occurs, and 0 otherwise.

The impact of the terror attack is examined on the exchange rate and stock return is depicted in the following Equations.

$$\mathrm{Ex}_{it} = \alpha + \beta_1 Bombing_t + \beta_2 \text{Armed assault}_t + \beta_3 Assassination_t + +\beta_4 Hostage\ taking_t + +\beta_5 Political\ news_t + +\beta_4 Budget\ news_t + \epsilon_i \text{ (3)}$$

$$Re_{it} = \alpha + \beta_1 Bombing_t + \beta_2 \text{Armed assault}_t + \beta_3 Assassination_t + +\beta_4 Hostage\ taking_t + +\beta_5 Political\ news_t + +\beta_4 Budget\ news_t + \epsilon_i \text{ (4)}$$

Where α and β are parameters to be anticipated, and ei is a random error.

Result and Discussion

The study employs a Panel model to examine the impact of terror attacks on the exchange rate and stock market returns. The Breusch-pagan Lagrange Multiplier test and Hausman test results show that the fixed-effect model is appropriate. The pre-diagnostic check results suggest that there is no autocorrelation, cross-sectional dependence, and heteroscedasticity.[5]

[5] The result of pre-diagnostic test are not reported for brevity purpose and will be provided on request.

Table 2 shows the estimation results of four countries i.e. Pakistan, India, Bangladesh, and Sri Lanka. The study makes use of these countries for analysis of terror attacks on both the stock market and exchange rate returns because of data availability. However, the separate analysis is shown of all SAARC countries in Tables 3 and 4 to determine the impact of attacks on the economy using the proxy of the exchange rate. In Table 2, the results show that bombing-type attacks negatively affect both the exchange rate and stock market returns. This implies that bombings are the only type of attack that has particularly adverse effects on both markets in the SAARC region. The coefficients for bombing-type attacks (Ex, $\beta = -0.0124362$; Re, $\beta = -0.0093510$) indicate that the exchange rate and stock market returns decline by 1.234% and 0.935% respectively for every additional attack of this type, which is significant at the 1% level. These findings are consistent with the findings by Chaudhry et al. (2018) that bombing has an inverse effect on the stock market. Conversely, the positive impact on the exchange rate is observed for other types of attacks which indicates that exchange rate returns are more affected by bombing-type terrorist shocks than other types such as assassination and hostage-taking type attacks. This may imply that the exchange rate transactions of these countries are determined based on foreign trade i.e. exports and imports which are mainly get affected by massive terror attacks like bombing and shelling than other relatively low-level terror attacks. On the other hand, stock returns are witnessed to get affected by assassination and hostage-taking type attacks which implies that stock market returns are more vulnerable to the news on assassination and hostage-taking type attacks than the forex market. Killing-type attacks remain insignificant for both variables. Moreover, it is observed that the exchange rate has a significant post-event impact of terrorist attacks and the effect prevails for almost a week (Post-day D+1, D+7). This finding is in contrast with the findings of Chaudhry et al. (2018) in which no significant post-period effects are witnessed. Conversely, stock market returns have no significant impact on post-days-event but respond immediately on the event day i.e., Attack-day (D0). The finding also suggests that political news has a negative impact on both exchange rate and stock market returns which implies that the financial markets of these countries are highly exposed to unstable political and governance disputes. Finally, results do show any impact of budget news on both markets.

Table 2: Estimation Results of Terrorism, Exchange rate, and Stock market returns

	Ex	Re
Pre-day (D-1)	-0.000824	-0.000614
Attack-day (D0)	-0.012488***	-0.010371***
Post-day (D+1)	-0.0002401**	-0.0001431
Pre-day (D-7)	-0.005224	-0.0003154
Post-day (D+7)	-0.0001208*	-0.0001431
Bombing	-0.0124362***	-0.0093510***
Assassination	0.0013249*	-0.0011679*
Armed assault	0.013195*	0.011071**
Hostage-taking	0.0137727*	-0.0134401*
Killing	-0.0000208	-0.0000301
Political news	-0.0000198**	-0.001259**
Budget news	0.0000663	0.0008568
cons	0.0009561	0.0002368

Note *, **, and *** demonstrate that p-values are significant at the 10%, 5%, and 1% levels, respectively. Ex stands for Δ Exchange rate and Re stands for Δ Stock market returns. The data sample consist of four countries; Pakistan, India, Bangladesh, and Sri Lanka.

Table 3 depicts the separate impact of terrorism on the exchange rate of all SAARC countries except Afghanistan.[6] The study finds similar results in Table 3. The exchange rate is negatively affected by bombing-type attacks and no such behavior is observed with other types of terror attacks. In addition, the post-event effects are more pronounced as compared to the event day.

Table 3: Estimation result of Terrorism and Exchange rate

	Ex
Pre-day (D-1)	-0.000932
Attack-day (D0)	-0.013571**
Post-day (D+1)	-0.003511***
Pre-day (D-7)	-0.06734
Post-day (D+7)	-0.002007**
Bombing	-0.014062***
Assassination	0.0015169*
Armed assault	0.020135*
Hostage-taking	0.0163861*
Killing	-0.0000138
Political news	-0.0003380**
Budget news	0.0001453
Cons	0.01324

Note *, **, and *** demonstrate that p-values are significant at the 10%, 5%, and 1% levels, respectively. Ex stands for Δ Exchange rate. The sample countries consist of all SAARC countries (Pakistan, India, Bangladesh, Sri Lanka, Maldives, and Bhutan) except Afghanistan.

Table 4: Estimation result of Terrorism and Exchange rate in Afghanistan

	Ex
Pre-day (D-1)	-0.000312
Attack-day (D0)	-0.009374***
Post-day (D+1)	-0.002301***
Pre-day (D-7)	-0.02114
Post-day (D+7)	-0.001202**
Bombing	-0.008022***
Assassination	-0.0007029*
Armed assault	-0.011153**
Hostage-taking	-0.0105661*
Killing	-0.000081**
Political news	-0.001210***
Budget news	0.00003
Cons	0.01019

Note *, **, and *** demonstrate that p-values are significant at the 10%, 5%, and 1% levels, respectively. Ex stands for Δ Exchange rate. The sample country is Afghanistan.

[6]Separate test on the sample of Afghanistan is conducted because Afghanistan is war-torn, security deteriorated, and state- of- crises country as compared to other countries (Rubin, 2000; Karell, 2017). The analysis is run to avoid the biased estimates.

This implies that terrorism has a damaging impact on foreign transactions and trade in SAARC countries which persists for almost a week. This may be a plausible reason for reduced foreign direct investment and tourism. Moreover, political news has a significant negative impact on the forex markets of countries which indicates that the financial markets of these developing countries have fragile economic structure and are more vulnerable to the shocks of political instability and poor governance. Furthermore, the results depict an insignificant effect in the case of killing-type attacks and budget news on both variables.

Table 4 shows the estimation results of terrorism and the exchange rate of Afghanistan. This separate test is conducted to avoid extreme results due to the reason that Afghanistan is a war-torn country and has fragmented economic structure as compared to other SAARC countries. Moreover, Afghanistan has reportedly the highest number of terror events compared to other SAARC countries.[7] The results are almost the same as witnessed in previous estimations except that all other types of attacks (Assassination, Armed assault, Hostage-taking, and killings) have a significant negative impact on the exchange rate. Moreover, this effect persists for a week as post-event days are significant. (D+1, D+7) This implies that Afghanistan has a higher negative impact of all types of terrorist events on its forex market. It is understood due to Afghanistan as a war-stricken country. The coefficients of other variables are similar but different in magnitude. The coefficients for Afghanistan are less than those for the complete sample countries.

Conclusion

This study contributes to academic literature in examining the impact of terrorist activities on currency and stock markets. While a lot of research has been done on measuring the effects of terrorism on stock market, little has been done to know its impacts on the forex market. Our study fills this research gap. In this research, terror attacks during the period of 2000 to 2017 are captured and their impacts are examined on both currency and stock markets using event study methodology and fixed regression model following Chaudhry et al. (2018). It is evident that terrorism has adverse effects on both the forex and stock markets of the SAARC countries. However, the forex market is discerned to be less resilient than the stock market. Bombing-type is a major attack type that has an inverse effect on both markets. The after-effect shocks are more pronounced and significant in forex markets than stock markets. This entails that terrorism influences foreign investments and trade which are key determinants of exchange rates. Moreover, the study finds the forex market of Afghanistan is a highly affected country from all types of terror attacks.

Our results have important implications not only for academicians but also for practitioners. The results suggest that the impact of terror attacks should be simultaneously tested on both exchange rates and stock market returns as both are found to be the barometer of an economy The study provides policy implications to regulatory authorities to improve intelligence and regulatory measures to create stability, reduce uncertainty and boost confidence among investors. The result entails that investors should formulate their investment decisions based on the potential gains and losses of foreign investments and exchange-based transactions in turbulent times. The findings provide policymakers the incentives to solve the deep-rooted economic hemorrhages that occur due to terrorism and unstable political and government setup. The governments of SAARC countries have to take strenuous endeavors to shore up the flattering economies of the SAARC region by tightening its security measures. Remedial actions need to be taken to save the turbulent economies from further chaos and jeopardy. It is witnessed that the forex and stock markets show dismal performance because of extremism and fanaticism which may be

[7] See Table 1

countered with stringent foreign policy and security measures. The data availability of terror events in recent times is one of the limitations of the current study. Future research could be conducted on extended data in other emerging economies. Moreover, future research may consider the factors that bring rise to terrorism and indirectly affect the financial markets of vulnerable economies. Furthermore, this work can be expanded by carrying a detailed analysis of the effect of terror attacks on abnormal returns and CARs of financial assets.

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. https://doi.org/10.1016/j.euroecorev.2007.08.005

Ahmar, M. (2015). *South Asian Response To the War on Terror*. 1–10.

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

Amano, R. A., & Van Norden, S. (1995). Terms of trade and real exchange rates: The Canadian evidence. *Journal of International Money and Finance, 14*(1), 83-104.

Arin, K. P., Ciferri, D., & Spagnolo, N. (2008). The price of terror: The effects of terrorism on stock market returns and volatility. *Economics Letters, 1010*, 67-164.

Balcilar, M., Bekiros, S., & Gupta, R. (2016a). The role of news-based uncertainty indices in predicting oil markets: A hybrid nonparametric quantile causality method. *Empirical Economics, 4(2)*, 40-70.

Balcilar, M., Gupta, R., Pierdzioch, C., & Wohar, M. E. (2017). Do terror attacks affect the dollar-pound exchange rate? A nonparametric causality-in-quantiles analysis. *North American Journal of Economics and Finance, 41*, 44-56.

Bensassi, S., & Martinez-Zarzoso, I. (2012). How costly is modern maritime piracy to the international community? *Review of International Economics, 20*, 869-883.

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

Brounen, D., & Derwall, J. (2010). The impact of terrorist attacks on international stock markets. *European Financial Management, 16*, 98-585.

Brock, S., & Gregory, D. (2004). *www.econstor.eu*.

Burlando, A., Cristea, A. D., & Lee, L. M. (2015). The Trade Consequences of Maritime Insecurity: Evidence from Somali Piracy. *Review of International Economics*, *23*(3), 525–557. https://doi.org/10.1111/roie.12183

Calvo, G. A., & Mendoza, E. G. (2000). Rational contagion and the globalization of securities markets. *Journal of International Economics, 51*, 79-113.

Charles, A., & Darne, O. (2006). Large shocks and the September 11th terrorist attacks on international stock markets. *Economic Modelling, 23*, 98-683.

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. (2004). The effects of terrorism on global capital markets. *European Journal of Political Economy, 20*, 66-349.

Chesnay, M., Reshetar, G., & Karaman, M. (2011). The impact of terrorism on financial markets: An empirical study. *Journal of Banking & Finance, 35*, 67-253.

Chkili, W., & Nguyen, D. K. (2014). Exchange rate movements and stock market returns in a regime-switching environment: Evidence for BRICS countries. *Research in International Business and Finance, 31*, 46-56.

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

Delgado, N. A. B., Delgado, E. B., & Saucedo, E. (2018). The relationship between oil prices, the stock market and the exchange rate: Evidence from Mexico. *The North American Journal of Economics and Finance, 45*, 266-275.

Dornbusch, R., & Fischer, S. (1980). Exchange rates and the current account. *The American Economic Review, 70*(5), 960-971.

Eckstein, Z., & Tsiddon, D. (2004a). Macroeconomic consequences of terror: Theory and the case of Israel. *Journal of monetary economics, 51*(5), 971-1002.

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

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

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.

Frankel, J. A. (1992). Monetary and portfolio-balance models of exchange rate determination *International economic policies and their theoretical foundations* (pp. 793-832): Elsevier.

Gaibulloev, K., & Sandler, T. (2008). Growth consequences of terrorism in western Europe. *Kyklos*, *61*(3), 411–424. https://doi.org/10.1111/j.1467-6435.2008.00409.x

GTD (2019)., National consortium for the study of terrorism and responses to terrorism, global terrorism database. Accessed September 25, 2019. (www.start.umd.edu/gtd)

Hassapis, C., Katsikides, S., & Markoulis, S. (2019). Terror Attacks, Foreign Exchange Markets and Class Dynamics. *Classes - From National to Global Class Formation*. https://doi.org/10.5772/intechopen.76607

Hons, M. T., Strauss, J., & Yong, S. Y. (2004). Contagion in financial markets after September 11: Myth or reality? *Journal of Financial Research, 27*(95), 24-45.

Karell, D. (2017). Local peace and contemporary conflict: Constructing commonality and exclusion during the war in Afghanistan. *Social science research, 61*, 75-97.

Karolyi, G. A., & Martell, R. (2010). Terrorism and the stock market. *International Review of Applied Financial Issues & Economics, 2*(2).

Kollias, C., Papadamou, S., & Stagiannis, A. (2011). Terrorism and capital markets: The effects of the Madrid and London bomb attacks. *International Review of Economics and Finance*, *20*(4), 532–541. https://doi.org/10.1016/j.iref.2010.09.004

Kumar, S., & Liu, J. (2013). Impact of terrorism on international stock markets. *Journal of Applied Business and Economics, 14*(4), 42-60.

Lin, C.-H. (2012). The comovement between exchange rates and stock prices in the Asian emerging markets. *International Review of Economics & Finance, 22*(1), 161-172.

Liu, L., & Wan, J. (2012). The relationships between shanghai stock market and CNY/USD exchange rate: New evidence based on cross-correlation analysis, structural cointegration and nonlinear causality test. *Physica A: Statistical Mechanics and its Applications, 391*(23), 6051-6059.

Maitah, M., Mustofa, J., & Ugur, G. (2017). The impact of terrorist attack on the foreign exchange rate: Case study of Turkish lira versus pound sterling. *Journal of Development Economics and Macroeconomics*.

Meese, R. A., & Rose, A. K. (1991). An empirical assessment of non-linearities in models of exchange rate determination. *Review of Economic Studies, 58*, 603-619.

Mussa, M. (1979). Macroeconomic interdependence and the exchange rate regime. In international economic policy: Theory and evidence. *The Johns Hopkins University Press: London, UK*, 160-199.

Markoulis, S. (2021). Do Terror Attacks Affect the Euro? Evidence from the 21st Century. *Journal of Risk and Financial Management*, *14*(8), 349. https://doi.org/10.3390/jrfm14080349

Nitsch, V., & Schumacher, D. (2004). Terrorism and international trade: An empirical investigation. *European Journal of Political Economy, 20*, 423-433.

Narayan, P. K., Narayan, S., Khademalomoom, S., & Phan, D. H. B. (2018). Do Terrorist Attacks Impact Exchange Rate Behavior? New International Evidence. *Economic Inquiry*, *56*(1), 547–561. https://doi.org/10.1111/ecin.12447

Pan, M.-S., Fok, R. C.-W., & Liu, Y. A. (2007). Dynamic linkages between exchange rates and stock prices: Evidence from East Asian markets. *International Review of Economics & Finance, 16*(4), 503-520.

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. https://doi.org/10.1016/j.intfin.2019.03.001

Park, J. S., & Newaz, M. K. (2018). Do terrorist attacks harm financial markets? A meta-analysis of event studies and the determinants of adverse impact. *Global Finance Journal*, *37*(June), 227–247. https://doi.org/10.1016/j.gfj.2018.06.003

Pham, C. S., & Doucouliagos, H. (2017). *Discussion PaPer series An Injury to One Is an Injury to All: Terrorism's Spillover Effects on Bilateral Trade*. www.iza.org

Qaiser, I., Sohail, D. N., Liaqat, M., & Mumtaz, A. (2012). Impact of terrorism on the forex market and Karachi stock exchange: Evidence from Pakistan. *European Journal of Business and Management, 4*(9).

Rubin, B. R. (2000). The political economy of war and peace in Afghanistan. *World Development, 28*(10), 1789-1803.

Schneider, F., Brück, T., & Meierrieks, D. (2015). The economics of counterterrorism: A survey. *Journal of Economic Surveys*, *29*(1), 131–157. https://doi.org/10.1111/joes.12060

Shah, M., & Faiz, M. (2015). Terrorism and Foreign Direct Investment: An Empirical Analysis of SAARC Countries. *City University Research Journal*, *5*(2), 219–233.

Soriano, P., Chulia, H., Climent, F. J., & Torro, H. (2009). Volatility transmission patterns and terrorist attacks r P Fo r R w On ly. In *Quantitative Finance*.

Smirlock, M., & Yawitz, J. (1985). Asset returns, discount rate changes, and market efficiency. *Journal of Finance, 40 (4)*, 1141-1158.

Stiglitz, J. E. (2003). Terrorism: There's no future in it. *Los Angeles Times, 31*.

Tavares, J. (2004). The open society assesses its enemies: Shocks, disasters, and terrorist attacks. *Journal of monetary economics, 51*(5), 1039-1070.

Tule, M., Dogo, M., & Uzonwanne, G. (2018). The volatility of stock market returns and the naira exchange rate. *Global Finance Journal, 35*, 97-105.

Walid, C., Chaker, A., Masood, O., & Fry, J. (2011). Stock market volatility and exchange rates in emerging countries: A Markov-state switching approach. *Emerging Markets Review, 12*(3), 272-292.

Walkenhorst, P., & Dihel, N. (2002). The impact of attacks of 11 September 2001 on international trading and transport activities. *OECD Working Paper TD/TC/WP*.

Yang, S.-Y., & Doong, S.-C. (2004). Price and volatility spillovers between stock prices and exchange rates: Empirical evidence from the G-7 countries. *International Journal of Business and Economics, 3*(2), 139.

Appendix

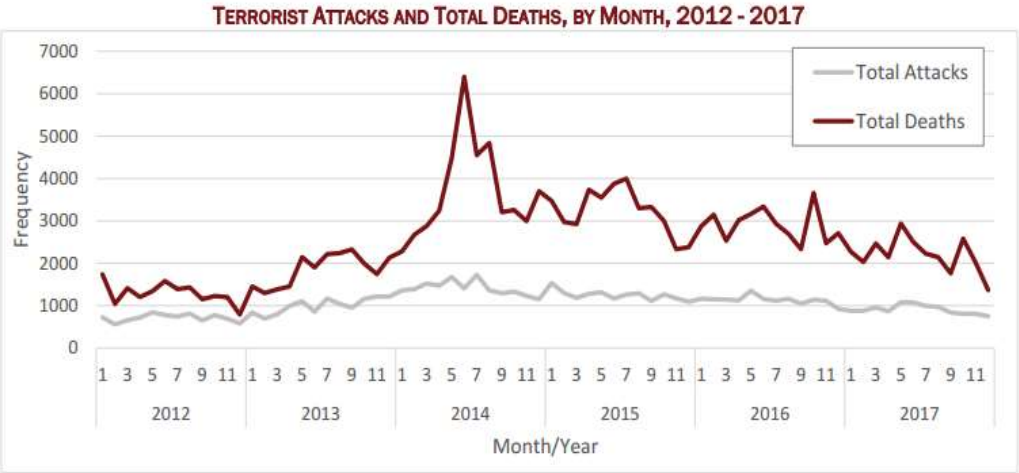

Figure A-1: Terrorist attacks at World level
Source: Global terrorism Database report, 2019 (www.start.umd.edu/gtd)

Table A-1: Terrorist Attacks and Total deaths in 2017 (By region)

Region	Total Attacks	% of Total	% Change from 2016	Total Deaths	% of Total	% Change from 2016
Middle East & North Africa	3780	35%	-38%	10819	41%	-44%
South Asia	3430	31%	-6%	7664	29%	-2%
Sub-Saharan Africa	1970	18%	-5%	6712	25%	1%
Southeast Asia	1020	9%	-5%	811	3%	27%
Western Europe	291	3%	7%	83	0%	-65%
South America	172	2%	8%	101	0%	16%
Eastern Europe	110	1%	-18%	101	0%	-10%
North America	97	1%	29%	124	0%	70%
Australasia & Oceania	12	0%	20%	4	0%	
Central Asia	7	0%	-59%	6	0%	-71%
East Asia	7	0%	-13%	16	0%	-50%
Central America & Caribbean	4	0%	33%	4	0%	-56%
Worldwide Total	**10900**	**100%**	**-20%**	**26445**	**100%**	**-24%**

Source: Global terrorism Database report, 2019 (www.start.umd.edu/gtd)