

12

Terror Attack and Indian Stock Market: An event Analysis

Mahesh Dahal* & Joy Das**

Abstract

The study examined the influence of terror attack on the Indian stock market by considering firms constituted under BSE 100 Index. Using event study methodology on daily price data collected from BSE India, the study observed overreaction of the market during the post event days. On event day although the market was on positive side, but a significant negative reaction is observed on immediate next days. The return kept changing showcasing the confused mindset of investors leading to overreaction of the market to the events as a whole.

Introduction

Terrorism is the unlawful use of force or violence against persons or property to intimidate a government or its citizen to further certain political or social objectives. The 8th report on terrorism in India published in 2008 defined terrorism as the peacetime

* Assistant Professor Department of Commerce, Pandit Deendayal Upadhyaya Adarsha Mahavidyalaya, Tulungia

** Professor, Department of Commerce, Nagaland University, Kohima Campus Meriema, Nagaland

equivalent of war crime. An act of terror in India includes any intentional act of violence that causes death, injury or property damage, induces fear, and is targeted against any group of people identified by their political, philosophical, ideological, racial, ethnic, religious or any other nature (Government of India, 2008).

India's tryst with terrorism and violent extremism can be traced back partly to the religion-based partition in 1947, which ripped the sub-continent into two nations. The sub-continent remained witness to the most horrifying ethnic riots in modern history, which were marked by extreme violence and acts of terrorism.

India, being a developing country, is facing different types of challenges in comparison to many of the other developed countries (Kumar, 2021). Among others, the threat that is the most menacing of all is that of terrorism. There was a time when terrorism was a distant concept wrapped with political motives and cross-border motivations, and to some extent was confined to the state of Jammu and Kashmir. Then it started spreading. Alarming, due to externally-sponsored Jihadi terrorism from Pakistan, India bled when the 2008 Mumbai attacks took place. Terrorist attacks result in many economic and social consequences. It damages to the infrastructure, biological loss, environmental damages, loss of confidence in the market and government, social disruption, failure of banking, trade and supply system.

Overview of the Terrorist Attacks happened in India during the last 5 years

Government of India, under the leadership of prime Minister of India in the last eight years, has achieved a huge success in finding a permanent solution the problems of terrorism in Kashmir and Armed Groups in the North East which had been a threat to internal security for many years (Institute for Conflict Management, 22-April-2022).

However, still the cases of terror attack can be witnessed within the Territory of India. Among other the terror attack on Amarnath Pilgrims is one of the worst attack which killed several pilgrims (Business standard, 2017). Another attack on CRPF in Chhattisgarh's Sukma district (Deccan Chronical, 2018) shocked the nation. The Pulwama attack of J&K where around

44 CRPF personnel were killed and several injured was one of the deadliest terror attacks (Karnad, Chellaney, Saran et al., 2019). The encounter in Chhattisgarh between police officials and maoist is also one of the deadliest attack on Indian forces, which took around 22 life police personal (The Indian Express, 2021).

Considering the India's position as one of the fastest growing nation and emerging hub for investment hotspot, it becomes important to examine the reaction of investors towards such incident. The result of the study showcases the confident of investors toward Indian market and economy despite such infamous incidents.

Literature Review

A few studies are found to be discussing the overall consequences of terrorism on world economies. However, there is not much evidence about the quantifications of the impact of terrorist activities on financial markets and with special reference to India. Thus, the researcher looks into the existing literature to form a better understanding of the destruction effects of terrorist attacks on the stock market and the findings are presented below.

Karolyi & Martell (2005) observe the effect of terror attack using event study methodology and found significant negative effect on stock market in US Stock Exchange Market. Christofis et al, (2013) examined the effect of the three Major Incidents on Istanbul Stock Exchange and reported only short-lived effects since the market rebound was fairly quick however, the tourist industry was found to be more adversely affected by these events. Liargovas & Repousis (2010) investigates the reaction of Greek banks to three major international terrorist events. And found that out of three major terrorist attacks only one resulted in significant abnormal return in Greek bank stocks. The study also indicated the overreaction of exchange to the terrorist attacks. Papakyriakou et al., (2019) on examining the reflect of terrorism acts on stock exchanges of G7 countries, resulted that there is significantly decline in stock market on the event day as well as on the next trading day. The investor's sentiment affects according to the country level news stories and social media sources. It is also found that there is sharp decline in indices after the event in the countries that leads to economic losses. Aksok (2014) found no statistically significant abnormal returns for the event day, the

market further declined in the post-event days and the analysis shows that Turkish stock market is sensitive to terrorism. Nguyen et al,(2021) studies the effect of terrorism on corporate investment in Indonesia and found negative reaction of corporate investment in the combined group. Kumar & Liu,(2013) investigates the effect of terrorist attacks on International Stock Markets and found negative impact of the event. Chaudhry et al,(2018) examines the effect of terrorism on stock markets in SAARC region and found that terrorism negatively affects the stock market returns of both highly affected and less affected countries Kousar et al,(2019) inspected the impact of terrorism on Stock Markets of South Asian countries and found negative effect on stock market return on Pakistan, India, and Bangladesh but insignificant impact in Sri Lankan stock market. Shoham et al, (2011) analyzed the effect of the attacks on abnormal returns on the Israel Stock Market and observed terrorist attack in the center of Israel has a negative effect for several days and when the attack takes place in the periphery, it has a less significant effect & no lasting impact after the first day. Aslam et al, (2020) examined the impact of terrorist incident and revealed that attacks targeted the security forces and commercial business places which have a significant unfavourable impact on the stock returns. Maitah et al (2017) analyzed the impact of terrorist attacks on exchange rate in Turkey and reveals that a negative impact on the exchange rate in both short run and long run. Markoulis & Neofytou (2019) examined the effect of major attacks in the US and Europe on industry- specific indices and the result shows the significant negative abnormal return on the day of attack. Gul et al (2010) assessed the impact of terrorist activities on the financial markets in Pakistan and found the terrorist activities negatively influence the financial market but the significant differ depending the market.

The existing literature consist of several studies on the impact of terror attack in different parts of the world which reveal that the occurrence of the event had both negative and positive impact on the stock markets. Also, it is found that emerging / developing nations are highly exposed to terrorism as compared to developed nations. However, the literature also showed some exceptions also. Further, it is found that the majority of the studies have been conducted in developed nations and only a few studies have

focused on emerging countries like India. Owing to lack of studies and inconclusive evidence the present study has been initiated to examine impact of terrorist attack on the Indian stock market. The study will provide valuable insights for policymakers, investors, and market participants, helping them to form informed decisions in uncertain and volatile times.

Research Methodology

Objective of the study

This study is undertaken to examine the impact of terror attack (terrorism) on the Indian stock market.

Data

In the present study, firms constituting BSE 100 index is taken into consideration for examining the impact of the terror attack on the Indian stock market.

Data source

The present study is based on secondary source of data. The stock prices of the respective firms are collected from the official website of BSE India. And the information and dates relating to the different terror attack has been collected from various news articles such as *The Times of India*, *The Hindu*, *Hindustan Times*, *The Economic Times*, *Money control news* for cross verification and authenticity and accuracy of the dates so collected.

Tools and Techniques:

Event Study Methodology:

The present study is an empirical work which relies on event study methodology to analyze the impact of terrorist attack on the Indian stock market. The event study methodology developed by (Fama et al, 1969) is considered as one of the most popular and suitable method to study the impact of an event on security returns for a particular period.

Calculation of return: To calculate the daily returns, a log return is used so as to minimize the skewness and to maintain the normality of the data.

Calculation of Expected Return: Using the Ordinary Least Square (OLS) market model developed by Sharpe (1963), the expected returns are calculated.

$$E(R_{j,t}) = \alpha_j + \beta_j R_{m,t}$$

Calculation of abnormal returns: Now the abnormal returns are calculated using the following formula-

$$AR_{j,t} = R_{j,t} - E(R_{j,t})$$

Calculation of average abnormal return: The Average Abnormal Return (AAR) are calculated by cross-sectional aggregation of the abnormal returns to understand the impact of the event on endorsed firms and it's competing firms

Calculation of cumulative average abnormal returns

In order to observe the impact of the event over multiple days, the cumulative average abnormal returns are calculated.

And finally, T-test is utilised to check if the statistical significance of the return so calculated.

Results and Findings

The figure 1 displays the behavior of AAR of BSE 100 companies during the announcement of terror attack. It is seen from the figure that the announcement has conveyed certain information into the market causing movement in the return series. The AAR prior to announcement day has shown a little volatility as the AAR on the day (-10) to (-5) shows positive return, on day (-4) it shows negative decline and again on day (-3) (-2) it shows sharp positive upraise and on day (-1) it has seen negative return. On event day (0) average return has shown positive upward shift. During the post- announcement period a certain decline in the return series on day (1) is witnessed. However, an upward shift in the market is observed on day (2) and again it started to decline slightly on day (3) but on day (4) an upward shift in the market is observed. While from day (5) to day (6) market witnessed upward shifts. Again, a significant decline on day (7) which remained extremely negative is seen. While a downward shift in the market has seen from day (8) to day (9) and upraise on day (10). Such fluctuation can be attributed to the investor's, non-acceptance, unwillingness

and confused mindset in processing the information released through the announcement of the events.

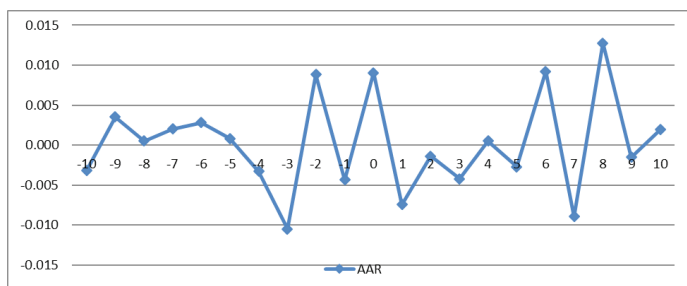


Figure 1: Average Abnormal returns of Firms around the Terror Attacks

Source: Author's calculation

The Average Abnormal Returns shows the impact of the event under BSE100 Companies around the Terror Attack for the event window. In the table 1, the average abnormal return that which is statistically tested by employing T-statistic along with their proportional P-values for the event window are summarized.

Table 1 Average Abnormal returns of Firms around the Terror Attacks

Days	AAR	p-value
-10	-0.003	0.51
-9	0.004	0.46
-8	0.001	0.91
-7	0.002	0.67
-6	0.003	0.56
-5	0.001	0.87
-4	-0.003	0.49
-3	-0.010	0.03**
-2	0.009	0.06*
-1	-0.004	0.37
0	0.009	0.06*
1	-0.007	0.12

2	-0.001	0.77
3	-0.004	0.38
4	0.001	0.91
5	-0.003	0.57
6	0.009	0.05*
7	-0.009	0.06*
8	0.013	0.01**
9	-0.002	0.75
10	0.002	0.69

Source: Author's calculation

Significant at: ***p-value<0.01, **p-value < 0.05, *p-value < 0.1

From Table 1, it is observed during the pre-announcement period there is negative return on day (-10) and it is seen a continuous positive for next five days from (-9) to (-5) and again negative for two days, on day (-3) average abnormal return has seen negative and significant and on day (-2) it is seen positive and significant at 10% level.

However, it is observed that the Average Abnormal Return on the day of the event is positively significant. Followed by insignificant negative abnormal return on day (+1), (+2) and (+3). On the day (+6) the market shows positively significant at 5% level and on day (+7) it shows negatively significant at 10% level, again on day (+8) the market has shown positive significant during the post-announcement period. From the behaviour of the average abnormal return in the post announcement period it can be inferred that the investors are confused regarding the information released and the market continue to fluctuate causing significantly volatility average abnormal return series.

Table 2: Cumulative Average Abnormal returns of Firms around the Terror Attacks

CAARs Windows	CAARs	P-values
(-2,2)	0.005	0.66
(-2,0)	0.014	0.10*

(0,2)	0.000	0.98
(-10,10)	0.005	0.85
(-1,0)	0.005	0.49
(0,1)	0.002	0.81
(-1,1)	-0.003	0.74

Source: Author's calculation

Significant at: ***p-value<0.01, **p-value < 0.05, *p-value < 0.1

Further the CAAR is present in table 2 shows positive and significant return for window (-2, 0) implying a positive market sentiment prior to the events. However in post event window the market seems to be insignificant indicating no significant impact of the event on stock returns.

Conclusion

The present study is an attempt to examine the impact of the terror attack on the Indian Stock market represented by the firms constituting BSE 100 index. The study has been carried by employing Event study Methodology on daily stock prices collected from the official website of BSE India.

The study has found that the impact in the stock market on the occurrences of the terror attacks for the last five years, are both negative and positive in the stock market. It has seen from the overall AAR of firms around the terror attack that the stock prices are negatively significant prior to the event. However, on the event day the market has responded positively with significant return. Such positive reaction of the market can also be seen during the Kargil conflict of 1999, the Sensex and Nifty gained 33 percent each. During the 3 months conflicts, Sensex collected 1,115 points and Nifty rushed 319 points and similarly, during the attacks in Mumbai in 2008, the Sensex surged 400 points in two-day trading. The Nifty rallied 100 points even when Mumbai was burning (Money Control, 2019). Such positive reaction of the market indicates the positive sentiment and confidence of the investors in the Indian Stock Market.

Bibliography

- AKSOY, M. (2014). The Effects of Terrorism on Turkish Stock Market. *Ege Academic Review*, 14(1), 31-41.
- Alam, A. (2013). Terrorism and Stock Market Developmend: Causality Evidence from Pakistan. *Journal of Financial Crime*, Vol. 20 Iss: 1 , 116-128.
- Aslam, F., Rasheed, A., & Hassan, M. (2020). Effect of Terrorism on Capital Market Returns: An Empirical Analysis of Emerging Market. *Accelerating the Worlds Research*, Vol. SI, No. 1, 39-46.
- Business standard. (2017, july 11). *business standard.com*. Retrieved from Business standard.
- Chaudhry, N., Roubaud, D., Akhter, W., & Shahbaz, M. (2018). Impact of terrorism on stock markets:Emoirical Evidence from the SSARC region. *Finance Research Letters*, 26, 230-234.
- Deccan Chronical. (2018, March 13). *Deccan Chronical*. Retrieved from Deccan Chronical.
- Ghani, M. (2016). Impact of Terrorism on Stock Market: Evidence from Pakistan Banking Sector. *International Journal of Management sciences and Business Research*, 5(11), 96-99.
- Gul, T., Hussain, A., Bangash, S., & Khattak, S. W. (2010). Impact of Terrorism on the Financial Market of Pakistan . *European Journal of Social Sciences*, volume 18, no. 1, 98-108.
- Institute for Conflict Management. (22-April-2022). overview of terror attack in india. Bhopal, Madhya pradesh.
- Karnad, B., Chellaney, B., Saran, S., & Parthasarathy, G. (2019, Feb 19). Responding to the Pulwama Terror Attack. Centre for Policy Research. Retrieved from Mint.
- Karolyi, G., & Martell, R. (2005). Terrorism and the Stock Market. *FBI Academy, Quantico, Virginia*, 25.
- Khalil, F., & Akhtar, W. (2017). Impact of Terrorist Attacks Stock Market Performance: A case of Pakistan. *Asian Journal of Economic Modelling*, Vol. 5, No.2, 208-222.
- Kousar, R., Imran, Z., Khan, Q. M., & Khurram, H. (2019). Impact of Terrorism on Stock Market: A case of South Asian Stock Markets. *Journal of Accounting and Finance in Emerging Economics*, vol.5, No 2, 2019(Issue 2 December 2019), 215-242.
- Kumar, J. (2021). Economics Impact of Terrorism in India. *Journal of Political Science & Public Affairs*.

- Kumar, S., & Liu, J. (2013). Impact of Terrorism on International Stock Markets. *Journal of Applied Business and Economics*, 42-60.
- Liargovas, P., & Repousis, S. (2010). The Impact of Terrorist on Greek Bank's Stocks: An Event Study. *International Research Journal of Finance and Economics*(51), 88-96.
- Linda. (2022, May 14). The cents of money. Retrieved August 17, 2022, from thecentsofmoney.com: <https://thecentsofmoney.com>
- Maitah, M., Mustofa, J., & Ugur, G. (2017). Impact of Terrorist Attack on Foreign Exchange Rate: Case Study of Turkish Lira VS Pound Sterling. *Economic Journal*, 2-8.
- Markoulis, S., & Neofytou, N. (2019). The Impact of Terror Attacks on Global Sectoral Capital Markets: An Empirical Study. *The Economics of Peace and Security Journal*, Vol.14, No. 1, 46-59.
- Money Control. (2019, February 27). Money control. Retrieved from Money control.com: <https://www.moneycontrol.com>
- 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*, 143-160.
- Qaisar, I., Sohail, D., Liaqat, M., & Mumtaz, A. (2012). Impact of Terrorism on Forex Market & Karachi Stock Exchange. *European Journal of Business and Management*, Vol 4, No. 19, 2012, 124-128.
- Rehman, S., Khilji, J. A., Kashif, M., & Rehan, R. (2018). The Impact of Major Terrorist Attacks on Stock Prices: The case of Karachi Stock Exchange. *Asian Economic and Financial Review*, Vol. 8, No.3, 394-405.
- Shoham, A., Rosenboim, M., Malul, M., & Saadon, Y. (2011). Core and Periphery- The Dual effect of Terror. *Peace Economics, Peace Science, and Public Policy*, Volume 17, issue 1, 1-13.
- The Indian Express. (2021, April 04). The Indian Express. Retrieved from The Indian Express.
- Trade Brains. (2022, July 7). Economic Investment Basics. Retrieved August 17, 2022, from tradebrains.in: <https://tradebrains.in>