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Effects Of Terrorism And Natural Calamities On Stock Market

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Abstract*: *The objective of the article is to reveal the consequences of Terrorism and Natural Calamities on the stock Markets. There are various risks associated with these events and most importantly no one can even forecast until and unless it occurs. This research enables us to understand that terrorism being a geopolitical event impacts the trade globally and natural calamities being region specific cause the damage to a confined area unless the area of devastation is a commercial center or a hub. It is observed that these two events bring high volatility in the market when they are either politically influenced and are responsible for great damage not only to humans but also to assets. The study used 10 events comprising of five terrorist events and five natural calamities. T test has been applied in order to understand the effect of the sample events. The study identified that these events demotivate the investors and force them to sell their investment in stock market. The effect of terrorism is significant whereas natural calamities did not have any significant effect on the stock market. But at this crucial moment any investor should not panic and shuffle the investments. Whereas speculators can take this as an opportunity to earn small gains after the occurrence of the event.

Keywords*: *Volatility, Natural Calamities, Terrorism, Devastation, Disaster

I. INTRODUCTION

Stock market provides prices of different stock of various industries. It indicates the volatility and uncertainty prevailing in the market. The volatility can be due to several reasons such as occurrence of any natural event or disaster, man-made events like terror attacks, political and economic events which not only affects the industry but also leads to disruption in the national and global economy (Abadie and Gardeazabal, 2003) [1]. In case of natural calamities, the business gets disrupted and the impact can be found on the stock market. On the other hand, man-made disaster's such as terrorism have proven to affect the stock indices with decrease in the prices (Drakos, 2009; Chen and Siems, 2004) [2]. Thus, both of them impact the market. It is indicated that there is a remarkable effect on the stability of market returns due to these activities (Enomoto and Nguyen, 2009) [3].

The present study has focused on two such events namely Terrorism and Natural calamities and tried to understand whether there is any effect on the stock market or not. The world is transient in nature and is interconnected which may affect our portfolio to great extent even if we are here in one part of the nation and the event has occurred in some other part of nation or any other country. Whereas it has pointed out that the events do not seem to influence local or international markets, thus suggesting that investors have learnt to better assess terror events and react more calmly to them. (Markoulis, Stelios and Katsikidis, Savvas, 2018) [4].

There can be a downturn in the market and investors may fear due to the negative impact on the stock prices. It is stated that event studies assessed the effect of both long-term and short-term time horizons on stock market (Corrado, 2011) [5]. Effects of ongoing terrorism on the economy of a country were assessed in numerous studies such as those by Alam (2013)[6], Suleman, 2012 [7], Arin et al. (2008) [8] ,Eckstein and Tsiddon (2004)[9] and Eldor and Melnick (2004) [10] , and most of them came up with a fact that they caused market fluctuations and effected market sentiments due to terrorism.

Therefore, the study will help the investors in understanding whether there is any chance of avoiding losses due to such events or not. It will also help the speculator to earn short term gains due to change in stock prices. Further, it will help the investors who are panic stricken by guiding them not to get influenced with the negative impacts of events and pull off their money from the market. Instead of being terrified they must wait and watch the market fluctuations and try to invest in certain sectors which are beneficial as per the current scenario.

II. LITERATURE REVIEW

The literature review has been divided into two parts. The first part discusses about terrorism and the second part discusses about the natural calamities.

Brounrn, Dirk and Derwall, Jeroen (2010) [11] in their study have examined the effects on market due to terrorism by collecting a data set that is responsible for significant effect on the market and are associated with major economies of the world. They have used event study and depicted that there is a mildly negative impact on market due to these negative unanticipated events and it has resulted into price effects. However, they even found that the market gained in the first week of aftermath. 31 terrorist attacks were considered in a panel to study the effect.

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They found that terror attacks have greater statistical and economic importance which brought price fluctuations.

These unanticipated or catastrophic events always bring downfall in the economy.

Suleman, Muhammad Tahir, (2012) [12] in his research paper has tried to analyze stock market reactions towards terrorist attacks. The has tried to evaluate that how financial markets have reacted in a consistent manner due to 9/11 attack in US Bali in 2002 and various other blasts and suicide attacks. He has concentrated on how these events have affected the return and volatility on the Karachi Stock Exchange. Employing GARCH model the study brought out the result that how bad and good news have impact on market volatility and how do they create a leverage effect.

Luo, Nannan, (2012) [13] has attempted to determine whether global stock markets react to the uncertain events like natural calamities and measure the impacts of these uncertain events. The paper studies 6 largest stock markets across the world. It is mainly focused on the Japanese Earthquake which had badly affected the industries and their stock prices. The data has been chosen from TSE and Tokyo Stock Price Index (TDPIX). The case study uses event study as its methodology and helps to study the market reaction within T= -10 to T= +10 days before and after the occurrence of event. It uses the statistical model, that is the market model to estimate and analyze the event. It even brings out the fact that industries like pharma sector, construction corporations have shown a positive impact as they are needed for reconstruction. This paper emphasizes to showcase the consequences of the catastrophe to the country and economy that is, Japanese Earthquake (2011). It has totally ruined the domestic market. The devastation brought a loss of $ 300 billion to the country. The result concluded that there was no significant impact on the overall performance of market but the stock market experienced a negative impact in daily average abnormal return due to earthquake.

Aslam and Kang (2013) [14] have evaluated the impact of 300 terrorist events on Karachi stock market over a period of 12 years. The study found that there is a significant negative impact on KSE-100 index returns. The more intense the terror attack, larger the negative impact on the stock market. The paper also brought out the fact that impact varies with respect to location and severity of the terrorist events.

Aslam, Faheem & et al (2015) [15] studied the impact of Terrorism on Financial markets by selecting a sample of 5 countries from the Asian Continent. The result states that the severity of the attack and the impact the stock market are positively correlated. They have used two types of data in which the first set includes daily prices of 5 Asian market indices and second data includes news on domestic terrorist events in respective countries. These countries not only have a developed stock market but have also faced relatively severe terrorist events. The empirical findings state that there is a significant impact of terrorism on the stock markets.

Muneeswaran R and Babu M (2017) [16] evaluates the impact of terrorism on Indian Capital Market. The paper studies 5 major events in India and their effect on economy. Statistical techniques like ADF and GARCH (1,1) have been used to describe it in detail. The study evaluated that the performance of stock market depends on the occurrence of external and internal factors as they are an important investment avenue. The study confirms that the attacks and terrorist events have adversely affected the market. The study inferred that short-term investors can make predictions about the reactions of the market and find investment solutions by investing in alternative stocks having low volatility.

Arif, Imtiaz & Suleman, Tahir (2017) [17] have done an empirical study on effect of Terrorism and Stock Market Linkage. The study investigated the impact of prolonged terrorist activities in different sectors in the KSE using Terrorism Impact Factor Index with 2011. Tools such as Normalised Cointegration Vector is used to find out the impact of terrorism on the prices of stock. The literature argues that stock market increases the economic growth by mobilizing savings, whereas, terrorism decreases the trust of the investors and prohibit the inflow of money. Long-term investments in terrorist prone countries is usually avoided by investors It brings a catastrophic effect on any nation's economy. Therefore, the study concludes that the market becomes insensitive to prolonged attacks.

Tavor, Tchai and Teitler-Regev Sharon (2019) [18] in their research paper have brought out the findings that negative events do have effect on the stock market. They stated that terrorism, artificial disasters and natural disasters cause volatility in the market and provide various profit opportunities. Using Pessimism Index, they studied around 344 events which caused great devastation and brought fluctuations in the stock market. It is found that artificial disasters exhibit lowest level of fluctuations whereas natural disasters bring higher severity. Further it is stated that investors can have arbitrage gains if they are keen-witted. Investors should short shell the shares on the day of event or the happening of disaster and hold it for the stipulated time period till the effect remains in the market. These disasters bring hazards to human life and cause major economic damage which is a great loss to any nation.

On the other hand, literature related to natural disaster and its effect on stock market in context to India and abroad has been reviewed. Benson, Charlotte and Clay, Edward (2003) [19] attempted to asses that how natural disasters effects stock prices and what are the options for mitigation. They have showcased the severe negative short-run economic impacts. These natural disasters cause significant budgetary pressures, they show short run impacts and wider long-term implications on the market. The study has employed an eclectic approach. This involves narration of historical data to study the event. The quantitative analysis involves regression analysis. The report concludes that these catastrophic events with high frequency require annual allocation of funds to meet the devastations and preparedness efforts in order to save oneself.

Loayza, N. V.; Olaberria, Rigolini, J.; & Christiaensen, L (2012) [20] used panel data to evaluate the effect of disasters on economic growth. It is found that natural disasters affect the economic growth but the effect can be either positive or negative. Any disaster can bring loss to specific sector and profit to few other.

The research concluded that developing nations have higher chances of devastation when compared to developed nations Wang, Lin & Kutan, M Ali (2013) [21] in their analysis have evaluated the impact of natural disasters on the stock market and insurance sector. GARCH model was used to identify the time- varying volatility. They brought out the fact of varying amplitude of stocks by using the techniques of ARCH family and also described it through descriptive statistics. It is evident from the study that there is a significant impact of the natural disaster on the stock market and insurance sector of Japan and US as they have affected the market returns and if the market is broad, then the impact can be diversified. The study concluded that US insurance market suffered great loss, whereas, there was a gain for the Japanese insurance sector.

Mahalingam et.al (2018) [22] have attempted to explore that how the catastrophic events have triggered the market shocks and led to subsequent economic downturns. They have considered six scenarios which included earthquake, tropical windstorm and volcanic eruptions and evaluated the magnitude of fluctuations and devastations in the market caused by these uncertain events.

III. NEED & OBJECTIVE OF THE STUDY

A. Need for the Study

The need of the study is to evaluate the effect of events such as terrorism and natural calamities on the Indian Stock Market. It aims to analyze the price reactions and investors ability to take risk due to unanticipated events. To understand and explain whether investors should be greedy or fearful in terms of investment during such events because it is wise to be '*fearful when others are greedy and greedy when others are fearful*'. It will help the investors and speculators to make wise decisions at the occurrence of uncertain events.

B. OBJECTIVES OF THE STUDY

1. To compare the pre and post-performance of stocks prices in BSE and NSE after the occurrence of unanticipated events such as terror attacks.
2. To compare the pre and post-performance of stock prices in BSE and NSE after the occurrence of unanticipated events such as natural calamities.

IV. RESEARCH METHODOLOGY

The study focuses on the short-term effect of events such as terrorism and natural calamities on the stock exchange of India. For this purpose, it is considering both the highly operated stock exchanges in India i.e., BSE and NSE. It is considering ten events comprising of five natural events such as floods and Tsunami and five man-made disaster i.e., terrorism. The sample comprises of four terrorist events occurred in Indian and one event occurred in abroad. It has also considered natural disaster that occurred only in India. The data is collected from BSE and NSE. To understand the effect of events on the stock prices the study considered the data of 10 days. Comprising five days prior to the event and five days succeeding the event. Statistical test such as T-test is used to validate the hypothesis whether there is a difference in the stock prices after the occurrence of an event.

V. RESULT AND DISCUSSION

There are many reasons for volatility in stock market. During the occurrence of natural disasters and man-made events such as terrorism, the behavior of investors changes due to fear of losing money. The study identifies the stock market volatility due to the change in reactions by the investors. T-test is used to compare the pre and post event stock prices in Indian stock market considering both BSE and NSE. The test has covered terror attacks and natural calamities which are responsible to bring fluctuations in the stock market.

A. Effect of Terrorism on BSE and NSE

The act of terrorism is a horrific incident wherein it effects the economy. The investors in most of the cases start selling their stock in distress depending on the degree of impact according to the location, distance from the stock market head office, number of deaths, political unrest, speculations etc. The study found that any act of terrorism will have higher impact depending on the distance and the effect of such things on national integrity and occurrence of such event at domestic level or international level. The Table 1 suggests that there is a significant difference in the stock prices of BSE and NSE due to terrorist attacks such as Pulwama attack, Indian Parliament attack, Hyderabad Blast and 9/11 attack in USA. In case of terrorist attack on Taj Mahal hotel it did not affect the stock prices of BSE and NSE.

In context to India, attack on Parliament, Pulwama and other attacks had higher impact as they were related to national integrity. In case of minor terrorist attacks lesser influence was depicted. The terrorist act on Taj mahal hotel did not find any significant impact on the BSE and NSE. It can be inferred that the events which are restricted to local areas do not show much influence on the stock market. On the other hands, terrorist attacks around the world like 9/11 in USA had a remarkable influence on the Indian stock market.

Table 1: Effect of Terrorism on BSE and NSE

		T	Df	Sig.
1	There is a significant effect of Pulwama attack on the BSE.	3.682	4	0.021
2	There is a significant effect of Pulwama attack on NSE.	3.114	4	0.036
3	There is a significant effect of Indian Parliament attack on the BSE.	6.677	4	0.003
4	There is a significant effect of Indian Parliament attack on the NSE.	6.213	4	0.003
5	There is a significant effect of US Terror attack on the BSE.	6.037	4	0.004
6	There is a significant effect of US Terror attack on the NSE.	6.046	4	0.004
7	There is a significant effect of Hyderabad Bombings on BSE.	-7.855	4	0.001
8	There is a significant effect of Hyderabad Bombings on NSE.	-6.234	4	0.003
9	There is significant effect of Mumbai Taj attack on BSE.	-1.245	4	0.281
10	There is significant effect of Mumbai Taj attack on NSE.	-1.405	4	0.233

It is evident that the investor reacts to such event either by buying or selling their respective investments in different stocks. The study suggests that the investors need not react to such events as they are generally short term in nature. But due to the fear of losing money they respond to any disruptions in financial markets and increase speculations as per their understanding. The investor should be hopeful and keen-witted while taking certain decisions and allow the market to auto correct itself. The study also suggests speculators to understand the dynamic effect of such event on the stock prices and they can obtain profit by selling the stock at the occurrence of terrorist attack and later on buy the same stock at a lower price after three to four days when the market is disrupted due to the effect of such event. The speculators must be vigilant, patient, optimistic and should not flow with market sentiments due to the movement of stocks and earn profits when rest of the world is in dilemma.

B. Effect of Natural Calamities on BSE & NSE

The Table 2 shows the effect of natural calamities on the BSE and NSE. All the research hypothesis were not accepted because the p-value is more than the significance level of 0.05%. The results states that there is no significance difference in the pre and post occurrence of natural disasters on the stock exchange except Tsunami.

The study found that most of the natural calamities were confined to the local areas but had larger impact on the lives of people and huge destruction and damages in monetary terms.

Table 2: Effect of Natural Calamities on BSE and NSE.

S. No		t	df	Sig. (2-tailed)
1	There is significant effect of Tsunami on BSE.	-1.202	4	.296
2	There is a significant effect of Tsunami on NSE.	-6.333	4	.003
3	There is significant effect of Mumbai Floods on BSE.	-.378	4	.725
4	There is significant effect of Mumbai Floods on NSE.	-1.348	4	.249
5	There is significant effect of South India Floods on BSE	1.161	4	.310
6	There is significant effect of South India Floods on NSE.	1.284	4	.268
7	There is significant effect of Kedarnath Floods on BSE.	.817	4	.460
8	There is significant effect of Kedarnath Floods on NSE.	.769	4	.485
9	There is significant effect of Kerala Floods on BSE.	-.150	4	.888
10	There is significant effect of Kerala Floods on NSE.	.430	4	.689

The study found that there is no significant effect of natural disasters on the stock market. In context to India, there is no statistical evidence to prove the effect of natural calamity on BSE and NSE. It is because the devastations were limited to a particular area and did not make a national or global impact. Therefore, the study suggests the investors to be optimistic and need not react to such natural calamities to avoid losses in stock market.

V. CONCLUSION

In India, we have witnessed both natural and man-made disaster in the recent years. Such events can have effect on the investments and economic growth of a country. Generally, the events have short term effect due to the reaction of investors in the stock market. The study concludes that the market is volatile in nature.

Any event happening at national or global level can the effect the sentiments of the investors investing in stock market. The study has attempted to evaluate the effect of both natural and man-made events on the stock market. The study found that terrorism has an effect on the stock market prices in short term whereas in the happening of terrorist attack, the investors may shuffle their portfolios either by purchasing or selling their stocks. The investor who wishes to make profit should be greedy, when the other investors are fearful. The investors investing in long term, need not react to such market sentiments because the effect of such act can be for very short duration ranging from 1-5 days on the other hand, the study suggests the speculators to react quickly and make buy or sell decision for short gains due to volatility in stock market. Lastly the study did not find any effect of natural calamities on stock market inferring that the investors need not fear in the occurrence of natural disaster such as floods and Tsunami because such events do not affect the stock market because they are confined to a specific region. The study concludes that this research results can have implication on both the speculators and investors investing in stock markets and further research can be carried out by using a larger sample consisting of events having larger magnitude and also by increasing the number of days.

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