Impact of Terrorism on Stock Market: Evidence from Pakistan Banking Sector

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Abstract— this study aimed to investigate the impact of terrorism on stock market. The two major terrorist attack's impact on stock market in 2014, the attack on army public school Peshawar and attack in Jinnah international airport Karachi. Event study approach is used to find the effect of these terrorist attack on stock market by constructing the estimation window of 250 days prior to event and event window of 31 days 15 days before the event 15 days after event and one event day. The population of study is all commercial bank in Pakistan by taking sample of 14 listed commercial banks in KSE100 index. Market model is use to find the expected return and abnormal returns determined by taking difference of actual and expected returns. The abnormal returns and cumulative abnormal returns show significant impact of army public school Peshawar attack, while there is insignificant impact of Jinnah international airport Karachi on bank's stock returns.

Keywords— Terrorism, Stock Returns, Event Study, Banking Sector, KSE 100 Index

Introduction

Terrorism is curse, and have adverse effect on national and international economy. Different economies are effected by terrorism directly and indirectly Kumar and Liu (2013). Direct cost include loss of lives, financial loss, impaired of infrastructure while indirect loss is long run effect of terrorism, decline in businesses, loss of foreign investment toward specific country. From past few year the terrorism is mainly focused by scholar after the incident of Sep, 2001 in New York. The geopolitical event of 9/11 effect the global financial markets and change the picture of entire world. Developing countries are also highly effected from terrorism due massive financial loss, destruction of infrastructure and decline in ongoing economic activities. In Pakistan terrorism has become a major and highly critical phenomenon from few years .According to economic survey of 2013-2014 Pakistan face massive loss of 8264.4 billion from 14 years.

From few year Pakistan financial market greatly affected by major terrorist activities, Lal masjid operation, and operation in Waziristan against terrorism, ex-prime minister Benazir Butto assassination Qaiser et al (2012).In Pakistan Dec, 2014 attack on army public school Peshawar 141 people dead most of them were children and 28 people dead in another major incident of Jinnah international airport Karachi in June 2014. The present study tend to find the effect of these two terrorist attacks, (the attack on army public school Peshawar and attack of Jinnah international airport Karachi) in banks stock returns for years 2014 by using event study approach.

Research Objective

To determine the behavior of banks stock prices in response of terrorism in Pakistan

Research Question

How do banks stock prices response of terrorism in Pakistan?

Limitation of Study

This study is limited to two terrorism attack (Army public school Peshawar and attack on Jinnah international airport Karachi) on banks stock prices in Pakistan for short time period but there are many other factors can affect the stock prices which are beyond the scope of this study. This study conducted on banking sector so result could not be generalized for all other sector of economy.

Literature Review

Literature shows a lot of work regarding to event studies. Event studies are used to find the stock market response to different event like, dividend announcements, bailout announcement, and different corporate event, merger and acquisition announcements, and earning announcement MacKinlay (1997) .Various studies conducted on terrorism attack to find their impact on different financial markets. Event study based on the efficient market hypothesis proposed by professor Fama (1969). According to this ''stock market is efficient if the prices fully reflected available information. Efficient market hypothesis divided into three forms weak form, strong form and semi strong form efficient.

The study of Barett, Heuson, Kolb, R., and Schropp (1987) also determined the impact of Fatal commercial airline crash event on stock market. The results shows airline crash event immediately effect on the stock market but after event stock prices had no reaction of fatal airline crash event. Liargovas and Reprusis (2010) examined the effect of terrorism on banks stock in Greek. Three major event Sep 11, 2001 attack in world trade center, March 11, 2004 Madrid train bombing and event of London train bombing event are taken to find the impact of terrorism on stock return. Event study approach is use to find the effect of these event on stock returns of banks. The results shows world trade center event had significant effect on bank's stock return while the event of train bombing had negative significant impact and third event of Madrid train bombing had no impact on the Banks's stock return in Greek.

Elder and Melnick (2004) investigated the impact of Palestine terrorist attack on exchange rate and stock prices in Israel. The impact analyzed by using daily time series data from the period of 1990 to 2003.the results indicate in long term both market equally effected by terror attack. The study of Drakos (2004) also analyzed the impact of 11 Sep, 2001 world trade center attack event on the stock prices of airline which are listed in different international stock markets.

The study of Chen and Siem (2004) determined the effect terrorism on global capital market by using event study methodology. US capital market response measured from 14 terrorist attack from 1915 and global capital market reaction determined by two major recent terrorist attacks of September 11, 2001 and Iraq's invasion of Kuwait in 1990.

Haroon (2012) tests the stock market efficiency of Karachi stock exchange. The behaviour of stock market analyzed for the period 1991 to 2011. Different test used to check the market efficiency and make the reliability in the results. The evidence show KSE is not weak form efficient. The results also show technical analysis past prices and return helpful to make investment decision in Karachi stock exchange.

Gul et al (2010) study determined the impact of terrorism on financial market in Pakistan for the period of 2006 -2008. The study find out the relation magnitude and direction of terrorism activities and financial markets includes Karachi stock exchange KIBOR and forex market. Both primary and secondary data used in the study. The impact of different terrorist activities on financial market is determined by using ordinary least square model. The study find terrorist activities badly effect the financial market but their impact varies from different market.

Hassan, Mahmood and Abbas (2014) examined three major terrorism attack, Benazir Bhutto attack, Marriott hotel and Dara Adam Khel attacks impact on the KSE 100 index in Pakistan. Event study approach is used to determine the effect of these terror attack on KSE 100 index. The results show immediate decline in KSE 100 index due to Benazir Bhutto attack while Marriott hotel event had negative impact during estimation period and Dara Adam Khel event had little impact on KSE 100 index.

As the evident from survey of literature no of studies have been conducted on terrorism impact on stock prices. This study is addition to literature to find the impact of two recent terrorist attack in 2014, attack in Army public school Peshawar and Jinnah international airport attack Karachi by using daily stock prices of banks which are listed in KSE 100 index

Conceptual Frame Work

In this study terrorism is independent variable and stock prices is dependent variable to which determine the effect of terrorist attack on banks stock prices. The behavior of banks stock prices in response of terrorist attack on Army public school Peshawar and attack on Jinnah international airport Karachi by using event study approach.

3. Methodology

The impact of terrorism on the banks stock prices in Pakistan is find by using event study. Event study is the method use to find the impact of specific event Mackinley (1997) The estimation window of 250 days before the event and event window of 31 days constructed 15 pre- event days 1 event day and 15 post event day to determine the impact of two major terrorist attack on stock market.

Market model is use to find the expected returns to find the abnormal returns around the event terrorist attack. Market model suggested by Sharp in (1963), it determined the linear relation between security returns and market portfolio return. Market model is powerful tool to determine the abnormal returns as compared to other method like capital asset pricing model, market index model it also free from criticism Chavali*, Zahid (2011).

The average abnormal return and cumulative average abnormal to find out the impact of two terrorist attack on banks stock prices in Pakistan. The abnormal returns is the difference between actual and expected returns and cumulative abnormal returns is the sum of abnormal returns. Mathematically it can be expressed as:

Abnormal returns=actual returns-expected returns

$AR_{it} = R_{it} - E(R_{it})$

Where

AR_{it}= Abnormal return of " i"security in time period t

$E(R_{it})$=expected return

R_{it} = Actual returns on security

The abnormal returns for individual security are averaged for each day surrounding the terrorist attack taken as event day 15 days before and -15 days after the terrorist attack. The AAR is the average deviation in actual return of security from expected return of security. The following model is used for calculating average abnormal returns AARs:

$$AAR_{it} = \frac{\sum_{i=1}^{N} AR_{it}}{N}$$

Where,

i= no of securities in the study

N= total no of securities in portfolio

t= the days surrounding the event day

The abnormal return around the all event widow calculated by taking difference of actual returns and return and expected return.

Cumulative Abnormal Returns

Cumulative average abnormal returns is sum of all average abnormal returns, it is used to observed the effect of terrorist attack in small runs because the response of stock returns cannot capture immediately it can be calculated by using CAR cumulative abnormal return.

The model used to compute the CAAR is:

$CAAR = \sum AAR_{it}$

Then t test is use to determine the impact of terrorism on stock returns at significance level of 1.96 if the t values greater then it show significance of terrorism and if less then show insignificance mean terrorism have no impact on bank stock prices. The average abnormal return, cumulative average abnormal returns and t values during the event of terrorist attack on army public school Peshawar during the event window of 31 days -15 days before the event +15 days after event day and one event day.

A.*Table 01*

B. *Table*

A. *Average Abnormal Returns, Cumulative Average Abnormal Returns t-values& results*

Average Abnormal Returns, Cumulative Average Abnormal Returns t-values& results

Days	AAR	CAAR	t values	Results
-15	-0.151	-0.151	-8.367	SIG
-14	-0.15	-0.301	-16.67	SIG
-13	-0.155	-0.456	-25.29	SIG
-12	-0.148	-0.605	-33.54	SIG
-11	-0.146	-0.751	-41.64	SIG
-10	-0.146	-0.898	-49.74	SIG
-9	-0.148	-1.046	-57.97	SIG
-8	-0.146	-1.193	-66.09	SIG
-7	-0.153	-1.346	-74.60	SIG
-6	-0.15	-1.496	-82.91	SIG
-5	-0.155	-1.652	-91.55	SIG
-4	-0.151	-1.803	-99.91	SIG
-3	-0.148	-1.951	-108.1	SIG
-2	-0.149	-2.101	-116.4	SIG
-1	-0.146	-2.248	-124.5	SIG
0	-0.148	-2.397	-132.7	SIG
1	-0.143	-2.541	-140.7	SIG
2	-0.157	-2.698	-149.5	SIG
3	-0.146	-2.845	-157.5	SIG
4	-0.140	-2.985	-165.3	SIG
5	-0.144	-3.130	-173.4	SIG
6	-0.152	-3.283	-181.8	SIG
7	-0.154	-3.437	-190.4	SIG
8	-0.139	-3.577	-198.1	SIG
9	-0.150	-3.727	-206.5	SIG
10	-0.154	-3.882	-215.0	SIG
11	-0.143	-4.026	-223.0	SIG
12	-0.146	-4.172	-231.1	SIG
13	-0.150	-4.322	-239.4	SIG
14	-0.147	-4.47	-247.6	SIG
15	-0.142	-4.612	-255.5	SIG

Days	AAR	CAAR	t values	Results
-15	-0.004	-0.005	-0.226	INSIG
-14	0.0049	0.0003	0.0146	INSIG
-13	-0.002	-0.002	-0.117	INSIG
-12	0.001	-0.001	-0.066	INSIG
-11	0.0008	-5E-04	-0.025	INSIG
-10	0.0025	0.002	0.0989	INSIG
-9	-0.000	0.0014	0.0711	INSIG
-8	0.0035	0.0049	0.2408	INSIG
-7	-0.009	-0.004	-0.204	INSIG
-6	-0.001	-0.005	-0.261	INSIG
-5	-0.004	-0.01	-0.501	INSIG
-4	-0.000	-0.011	-0.532	INSIG
-3	-0.006	-0.017	-0.829	INSIG
-2	-0.001	-0.019	-0.917	INSIG
-1	-0.004	-0.023	-1.15	INSIG
0	-8E-05	-0.023	-1.153	INSIG
1	-0.005	-0.028	-1.399	INSIG
2	0.004	-0.024	-1.204	INSIG
3	-0.002	-0.027	-1.342	INSIG
4	0.0072	-0.02	-0.987	INSIG
5	-0.002	-0.023	-1.131	INSIG
6	-0.000	-0.024	-1.177	INSIG
7	-0.008	-0.032	-1.582	INSIG
8	0.0045	-0.028	-1.362	INSIG
9	-0.005	-0.033	-1.611	INSIG
10	-0.003	-0.036	-1.763	INSIG
11	0.0037	-0.032	-1.583	INSIG
12	0.0027	-0.029	-1.448	INSIG
13	0.0079	-0.022	-1.062	INSIG
14	-0.003	-0.025	-1.246	INSIG
15	0.0011	-0.024	-1.193	INSIG

The results of above table show abnormal returns and cumulative abnormal returns during the event window. The parametric t test clearly indicate the significance impact of event of terrorism attack on army public school Peshawar on banks stock return list in Karachi stock exchange. Other event taken in this study is attack in Jinnah international airport Karachi. the average abnormal returns, cumulative average abnormal returns and t values during the event window of 31 days 15 days before attack and 15 days after attack and one event day (Jinnah international airport attack) shown in table 2

The attack on Jinnah international airport event have no significant impact on the bank stock returns in Pakistan. The above table clearly indicate insignificant impact of this terrorist attack. The same pattern of average abnormal returns and cumulative abnormal returns during this event. There may be several reason for these result due to the difference in nature of attack, no of casualties also different in these two terrorist attack, difference in targeted area, one important reason the attack on army public school Peshawar was bigger than the attack on Jinnah international airport Karachi. The attack on army public school Peshawar create massive aggression in whole country as compare to attack in Jinnah international airport.

Conclusion

The present study focuses on the impact of terrorism on stock market. The two major terrorist attack in 2014, attack in Army public school Peshawar and Jinnah international airport Karachi attack are under taken in the study to determine the impact on bank's stock prices. Event study approach is used to examine the impact by constructing the 250 days estimation window before the event and event window of 31 days. The average abnormal returns and cumulative average abnormal returns show significant impact of Army public school Peshawar while there is no impact of Jinnah international airport Karachi on bank's stock prices.

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