THE MARKET REACTION ON THE NEW YORK STOCK EXCHANGE DUE TO THE OKLAHOMA CITY BOMBING

Katerina Lyroudi, Ph.D.

Dept. of Accounting and Finance
University of Macedonia

Vasilis Kalivis, MBA

University of Southampton,
UK

Abstract

This study tries to access the impact of the terrorist attack in 1995 in Oklahoma City, on the stock value of selected industries that are sensitive to unexpected catastrophic events such as terrorist attacks. The methodology used is the typical event study methodology. The results indicated that the airline, the multi-line insurance, the retailing and the transportation industries exhibited negative abnormal returns upon the announcement of the bombing. On the other hand the aerospace and defense industries, the courier and airfreight, the insurance and the integrated oil and gas industries exhibited positive abnormal returns on the event date.

Keywords
terrorist attacks, market reaction, even study.

JEL classification
G14

1. Introduction

The last 20 years have witnessed a wave of terrorist attacks spread all over the globe. Even the United States was not unaffected. In 1995, the Oklahoma City bombing was the largest terrorist attack in the history of the United States (until the September 11th, 2001). It was orchestrated by an internal terrorist group in contrast to the latter attack which was set up by an external terrorist group. This difference leads us to regard each event separately, since they cannot be classified in the same category. This study examines the contagion effects and market reaction to an unexpected catastrophic event. Such an event is likely to have a negative impact on the shares listed in an efficient stock market such as the New York Stock Exchange (NYSE) [Fama (1970), Chen and Siems (2004)].

According to the United Nations definition terrorism can be defined as follows: "Terrorism is an anxiety-inspiring method of repeated violent action, employed by (semi-) clandestine individual, group or state actors, for idiosyncratic, criminal or political reasons, whereby – in contrast to assassination – the direct targets of violence are not the main targets. The immediate human victims of violence are generally chosen randomly (targets of opportunity) or selectively (representative or symbolic targets) from a target population, and serve as message generators. Threat- and violence-based communication processes between terrorist (organization), (imperilled) victims, and main targets are used to manipulate the main target (audience(s), turning it into a target of terror, a target of demands, or a target of attention, depending on whether intimidation, coercion, or propaganda is primarily sought [Schmid (1988)]" (http://www.unodc.org/unodc/terrorism_definitions.html).

Therefore, a terrorist attack could be expected to have a negative impact in the market because it alters the investors' consumption and investment decisions, affecting certain industries more than others. The industries that could be most affected by such an event are: the aerospace and defense, the airfreight and couriers, the insurance, the multi-line insur-

ance, the casinos and gaming, the retailing, the integrated oil and gas and the transportation industry.

The Oklahoma City bombing occurred at 09:02 am local time, April 19 in 1995. The terrorist attack which had been set up and executed by a Gulf war veteran named Timothy Mc Veigh and his assistants, took place in front of a U.S. government office complex (Alfred P. Murrah Federal Building) which was entirely destroyed. Taking into consideration that the NYSE was opened for 30 minutes since the time that the terrorist attack[1] took place, it must be underlined that until the arrest of Timothy Mc Veigh (one hour after the explosion) the major initial suspect was Osama Bin Laden - the leader of the terrorist organisation al-Qaeda[2]. 168 people were killed from the collapse of the governmental building, more than 800 people were injured while the explosion of the truck bomb damaged over 300 buildings. The psychological impact was deep for the citizens of Oklahoma while the significant magnitude of the bombing's effects can also be impressed by the introduction of the Antiterrorism and Effective Death Penalty Act of 1996.

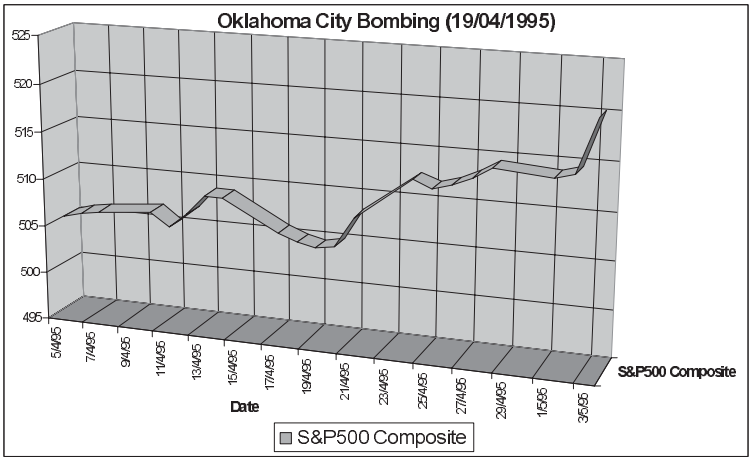
Though, the Oklahoma City bombing had been characterised as the largest terrorist attack in the history of the United States (until the September 11th, 2001 terrorist attack in the New York City) caused by domestic terrorists within the boards, the reaction of the stock market the day of the attack was not meaningful. The S&P500 Composite index closed at -0.09% while the following 7 trading days the index followed a positive trend (see Figure 1).

In order to achieve our objective, this study in structured as follows: Section 2 presents a brief literature review. Section 3 describes the date and the methodology. Section 4 discusses and analyses the results and section 5 contains a summary and concluding remarks.

---

1. The NYSE operates from 09:30 through 16:00 local time (New York) while the regional time difference is of one hour time zone in favour of New York.
2. Al-Qaeda is a network of terrorist Islamist organisations.

Figure 1. Oklahoma City Bombing.



2. Review of Literature

Event studies examine the impact of particular events on the value of individual companies or industries. Furthermore, they have the ability to investigate the level of vulnerability and stability of capital markets as a whole in the light of "bad" or "good" news. On the one hand the event study methodology can be characterised as a classic pattern for the examination of market's, firm's or industries' reaction to particular events but on the other hand it must be underlined that there were lots of studies in the past that followed resembling methodologies depending each time on the type and purpose of the research.

Prior research on that area can be broken into two major categories: first, studies that examine the impact of anticipated events, such as forthcoming stock splits or mergers and second, studies that examine the effect of totally unanticipated events, such as terrorist attacks, physical catastrophes etc. Too little research has been done on the market's reaction to terrorist attacks due to the low frequency of such events, while most papers investigate the reaction of individual companies or industries to anticipated events.

The whole event study literature is based on the efficient market hypothesis (EMH), Fama (1970). The efficient markets hypothesis (EMH) suggests that it is very difficult and unlikely to make a profit from predicting stock price movements. The main mechanism behind price changes is the announcement of new information. A market can be defined as "efficient" if stock prices adjust instantaneously and, on average, without bias to new information. As a result, the current prices of securities reflect all available information at any given point in time.

According to Fama (1970) there are three types of market efficiency: The weak form efficiency, when previous prices are useless for forecasting future prices which implies that technical analysis is useless. The semi-strong form efficiency, when all publicly available information is useless in predicting future prices and the strong form efficiency, when all information (public and private) is useless for forecasting future prices.

Maloney and Mulherin (1998) examined the efficient market hypothesis by studying stock price movements around the explosion of the space shuttle Challenger. In addition to new information they regarded also aspects such as psychological factors and noise trading, to see whether the letter affected stock prices. Their results revealed an immediate negative market reaction.

Brooks, Patel and Tie (2003) studied market reaction to unanticipated events such as physical catastrophes or terrorist attacks and found that such events had a negative impact on equity markets. Based on the event study methodology, the researchers examined equity market's reaction in terms of prices, volume, spreads and trading location under the stressful conditions of 21 totally unanticipated news events based on intraday transaction data. The negative unanticipated events were distinguished into four major categories: "unexpected", "unanticipated", "surprised" and "shocked". It must be underlined that some of these events took place not only when the stock exchange was open (daytime events) but also when it was closed as well (overnight events). The trading process after the announcements of unanticipated events was examined on an equal-weighted basis of the fol-

lowing five variables: "price", "spread", "volume", "volatility" and "location".

The results of their research suggested that unanticipated events had an impact on equities prices, but the response time of stock exchanges in the light of a negative unanticipated event was longer than previous studies had reported. "Prior studies show that the price reaction to announcements of scheduled events takes place within 1-15 minutes. In our study the initial price reaction to announcements of unanticipated events takes over 20 minutes" [Brooks, Patel and Tie (2003)]. Moreover, it was found that prices reacted immediately for overnight events while it took longer to react to events that occurred when the stock market was open. Stock prices reacted immediately for overnight events because investors had more time to digest any event and assess its impact on their portfolio in every detail. Thus, next morning when the stock market opened share prices reacted immediately.

Furthermore, one other finding was that markets overreacted to negative events in accordance to prior studies of DeBondt and Thaler (1985, 1987), Brown, Harlow and Tinic (1988) and Bremmel ans Sweeny (1991).

Chen and Siems (2004) examined the U.S. capital market's response to fourteen terrorist/military attacks from 1915 to 2001 (September 11th), including Iraq's invasion of Kuwait in 1990. They tried to answer three major research questions. First, whether terrorist or military attacks affected negatively the U.S. capital markets. Second, whether the above affected negatively the global capital markets. Third, whether the banking/financial sector was able to help minimise crises in capital markets after the terrorist/military attacks. According to the study's findings, all 33 global capital markets that comprised the sample of the research, experienced significant negative abnormal returns (ARs) when the terrorist attack of the September 11th became known in those markets. In particular, 94% of the sample experienced significant negative ARs at the 0.01 level while stock markets of Helsinki and Austria declined at the 0.01 level. It was noticeable that the only events with positive abnormal returns the day of the event were the bombing of the Alfred P.

Murrah Federal Building in Oklahoma City on April 19, 1995 and the Embassy bombing in Kenya on August 7, 1998.

Chen and Siems (2004) based on their results concluded the following: First, that every military or terrorist attack has a deep impact on stock markets around the world in a short period of time. Second, that nowadays information spreads rapidly since capital markets are inter-linked tightly. Third, there was a significant contribution of the U.S. stable banking and financial sectors, which reduced markets' panic by providing adequate liquidity. Finally, it was underlined that U.S. capital markets performed with a greater volume of elasticity in contrast to the past, while at the same time, they had the ability to recover from terrorist attacks sooner compared to the other thirty two capital markets.

Carter and Simkins (2002) investigated the reaction of airline stock prices to the attack of the September 11th , 2001 on the first trading day after the attack and during the period when the Air Transportation Safety and System Stabilization Act were approved by the Congress. The authors followed the multivariate (MVRM) regression model and not the standard event study methodology while the sample that was chosen for the research included 18 US airlines, 7 international airlines as well as 4 airfreight carriers. The six variables of the MVRM were the total assets, the cash and short-term investments, the ROA ratio, the total available seat miles (millions) as well as the total freight ton miles (millions) of each airline. Within the framework of the MVRM, a number of hypotheses were tested. First, they tested the market's reaction to the September 11th attack, in order to determine whether significant abnormal returns were generated due to that event. Second, two other related joint hypotheses were examined to determine whether the volume of the reaction was the same for each firm or whether the market differentiated based on specific characteristics of each firm. The authors used returns for a 166-day period beginning on May 1st, 2001 and continuing through December 31st, 2001. They included six dummy variables for each of the trading days from September 17th to September 24th, to capture the market's reaction to the terrorist attacks

when trading resumed on September 17th and the effect on the airlines. The results showed significant negative abnormal returns for all airlines due to the attacks. The magnitude of the ARs was bigger for the passenger airlines, especially for the US airlines, than that for the international airlines and the airfreight carriers, where only two out of four firms exhibited significant ARs.

On the other hand, during the period when the Air Transportation Safety and System Stabilization Act was approved by the Congress, the reaction was positive and the major airline firms benefited more relatively to the smaller ones.

Barrett, Heuson, Kolb and Schropp (1987) investigated the reaction of the airline industry to 78 fatal airline crashes following the typical event study methodology for an estimation window of day-205 to day-6, in order to minimise the probability that any of the crashes examined was anticipated. Their results indicated that the negative market reaction was significant for only one full trading day after the event occurred. There was observed vapid assimilation of new information.

Thompson, Zaman and Kirmani (1994) measured the market reaction in the U.S.A. to the announcement of physical catastrophes (mostly hurricanes) for publicly traded property/casualty companies on the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX) and the NASDAQ market from 1970 to 1992. The results revealed that the market reaction depended on where the firm was listed. Those listed on the NASDAQ appeared more sensitive to the occurrance of natural disasters compared to those listed on the NYSE or the AMEX.

Drakos (2002) studied the shifts in risk in the airline sector after the September 11th attack. The author did not focus on the abnormal returns but on the risk of the firms' assets that were affected by terrorism, His results showed that the systematic risk of the airline companies and the total risk of the airline industry had increased significantly due to the terrorist incident. Furthermore, the market's volatility had increased dramatically in the post September 11th period.

3. Data and Methodology

The current study follows the classic event study methodology [Brown and Warner (1985)], since it is the most appropriate research method for measuring the impact of a specific event on the value of a firm, industry or whole stock market by using stock prices. According to Henderson (1990), there are two types of event studies: the market efficiency studies that examine how quickly the market reacts to a particular type of new information and the information usefulness studies that examine the degree to which stock returns react to the release of a particular piece of information. The present study belongs to the second type of event studies since it examines how particular industries reacted to the announcement of totally unexpected news such as the Oklahoma City bombing (19th of April 1995), by terrorists.

The first and pivotal step that event studies should take is to define not only the event but also the date when it took place and the time if possible and necessary. The second step is to determine the criteria that were set for the formation of the data sample. The sample of this study is comprised by industries that are quoted in the NYSE and that are considered either as 'vulnerable' or as 'fully' or 'partially' 'sensitive' to major terrorist attacks. For instance, such a shocking event such is expected to have a significant psychological impact on airlines' customers since the feeling of fear and uncertainty are dramatically increased due to the type of the terrorist attack. Thus, the airline industry is expected to generate greater negative abnormal returns than it is expected from the other industries. The airfreight & courier industry as well as the transportation one were chosen as closely related to the airline industry. The aerospace & defence industry is considered as a sensitive one to terrorist events since uncertainty about national security creates the need for additional public investments on defence and security systems. On the other hand, it should be underlined that most aerospace companies do not produce only defence systems but equipment for civil aircrafts as well. Thus, a significant fall in the demand of airline services it is expected to lead to a lower demand for additional aircrafts and consequently a

decrease in aerospace industry's profits and share prices.

Moreover, the insurance and multi-line insurance sector was chosen since they are considered as totally dependent on terrorist events. On the one hand, the insurance industries are expected to generate lower negative abnormal returns because in the long-term totally unanticipated events of that level increase the demand for life-insurance contracts or for insurance against operational risk. However, immediately after a tremendous catastrophic event, insurance companies must pay considerable amounts of money to their customers as compensations in a short period of time.

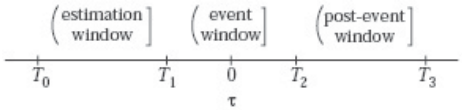
In addition, the casinos & gaming industry were chosen as fully sensitive ones to terrorist attacks since consumers need for gaming and entertainment is expected to fall due to the immediate negative psychological symptoms of a terrorist attack. Furthermore, the retailing industry was chosen as the least sensitive one. Though, on the one hand, it may seem reasonable that a major terrorist attack is not able to reduce the clothing or food consumption, on the other hand, the atmosphere that surrounds such an event, reduces the desire for shopping either due to the rumours of a forthcoming attack or due to other psychological factors. Finally, the integrated oil & gas sector was chosen since oil prices are characterised as highly volatile and susceptible to terrorism.

In particular, the industries comprising the sample are: the aerospace & defence (SP5IAED), airfreight & couriers (SP5IAIF), airlines (SP5SAIR), insurance (SP5IINS), multiline insurance (SP5SMKR), casinos & gaming (SP5SCAS), retailing (SP5GRET), integrated oil & gas (SP5SIOG) as well as the transportation one (SP5GTRS). All prior event studies were built on the fundamental hypothesis of the efficient markets (EMH). The NYSE was chosen since it is considered as a semi-strong efficient one since it is a major international market.

The third step is the definition of the estimation window[3],

3. The estimation window is the period during which we estimate the normal (expected) returns for each industry.

Figure 2. Event Study Periods.



the event window[4] as well as the post-event window[5](see Figure 2).

There are no objective selection criteria for the determination of the estimation window's length. It usually varies depending on the type of the event under examination. Following Chen and Siems (2004) we examine short even windows and longer ones, in order to observe how quickly the market incorporated or absorbed the news of the terrorist attack. The two extended event windows are plus 7 trading days from the terrorist attack and from the event date to 14 days following the terrorist attack. We calculate the abnormal and cumulative abnormal returns for these extended event windows.

The fourth step is the calculation of the expected (normal), abnormal (excess) and cumulative abnormal returns for each industry. For the calculation of expected (normal) returns two models can be used: the constant mean return model (CMRM) which is based on the assumption that the mean return of a security is constant through time and the market model or single-index market model (SIMM) where it is assumed that stock returns are determined by a market factor (R_{mt}) and a firm-specific factor (ε_{it}). According to MacKinlay (1997), the results by using the constant return model are consistent with those from the market model hence, here the market model is adopted:

4. "Several days before and after the event. This is the time period over which you think you will observe some market reaction to the event. We use some days before the event because lots of time news leaks out before the public announcement. We use some days after the event because sometimes it takes a day or two for the market to fully impound the effects of the event into the stock price" (Phillip Daves, 2002).
5. The post-event window is the period during which we calculate the abnormal returns as well as the cumulative abnormal returns.

$$R_{it} = a_i + b_i R_{mt} + \varepsilon_{it} \quad (1)$$

Where: R_{it} = the daily return of the industry (i) on day (t).
R_{mt} = the daily return of the market (m) on day (t). The market is represented by the Standard and Poor's Composite 500 index.
a_i = the constant term, the intercept of the market model.
b_i = the slope of the industry's (i) characteristic line and is equal to:

$$b_i = COV(R_{it}\, R_{mt})/Var\,(R_{mt}) \quad (2)$$

ε_{it} = the disturbance term with zero mean and constant variance according to:

$$E(\varepsilon_{it}=0) \text{ and } Var(\varepsilon_{it}) = \sigma_{\varepsilon i}^{\,2} \quad (3)$$

The coefficient b_i measures the sensitivity of security or industry (i) to the market's changes. We run OLS regressions from day -205 to day -6 for each industry (the estimation period) to obtain the estimates of the beta coefficient parameters to use during the event and the post event period (the examination period), in order to calculate the expected returns from day -5 to day +20 around event date and the abnormal returns as follows:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} \quad (4)$$

$$AR_{it} = R_{it} - E(R_{it}) = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (5)$$

Where: $E(R_{it})$ = the expected return of the daily return (R_{it}) based on the estimated beta coefficient (β_i).
AR_{it} = the daily abnormal return of industry (i) on day (t).
α_i = the estimate of the intercept (a_i).
β_i = the estimate of the slope (b_i) which indicates the systematic risk of industry (i).

The estimate of the intercept should be equal to zero for the market model to be well specified for each stock/industry in the portfolio. The estimate of the slope would indicate the systematic risk of industry (i). If it were zero it would indicate that market factors do not influence the returns of that particular security/industry. If it were greater, less as equal to one, it would imply that the particular security/industry was more, less or equally risky respectively to the market portfolio.

We also want to study the magnitude of the Oklahoma City bombing to the selected industries as a group on the event day. Thus, we use the average abnormal return $A_o(AR)$ which is defined as the sum of the selected industries' abnormal returns on the event date, divided by the number of those industries.

$$A_0(AR) = \left[\sum_{i=1}^{N}(AR_{i0})\right]/N \qquad (6)$$

Where: N= the number of industries.
AR_{i0} = the abnormal returns of industry (i) on day (0), the event day.

In addition to the event day abnormal returns where we can observe the immediate market's reaction to the terrorist attack, we also investigate the cumulative average abnormal returns. The latter show a stronger indication of the market's resilience and its ability or inability to recover from the unexpected event (news). We estimate the average cumulative abnormal returns for each day of the event window period, as follows:

$$CAR_{T1,\,T2} = \sum_{t=T1}^{T2} AR_t \qquad (7)$$

Where: T_1 is the beginning of the event period and T_2 is the end of the event period.

The null hypothesis is that the CARs are equal to zero. In order to test that the abnormal and the cumulative abnormal returns are statistically different from zero we use the

following t statistics respectively:

$$t_{AR}=AR_t/STD(AR_t) \quad (8)$$
$$t_{CAR}=CAR_t/STD(CAR) \quad (9)$$

Where: $STD(AR_t)$ = the standard deviation of the abnormal returns for the estimation period (dayt=-205 to day t=-6).

STD(CAR)= the standard deviation of the cumulative abnormal returns for the examination period and is estimated as follows:

$$STD(CAR)= [VAR(AR_t) * T]^{1/2} \quad (10)$$

T = the number of trading days for the cumulative abnormal returns in the interval examined.

The variance and the standard deviation are estimated for the estimation period, from day t=-205 to day t=-6, since we assume that the variability of the returns should be same for the time period before and after the event.

The returns of the S&P500 Composite Index, which represent the market returns, as well as the returns of the selected industries were collected from the Thomson DataStream Advance Database.

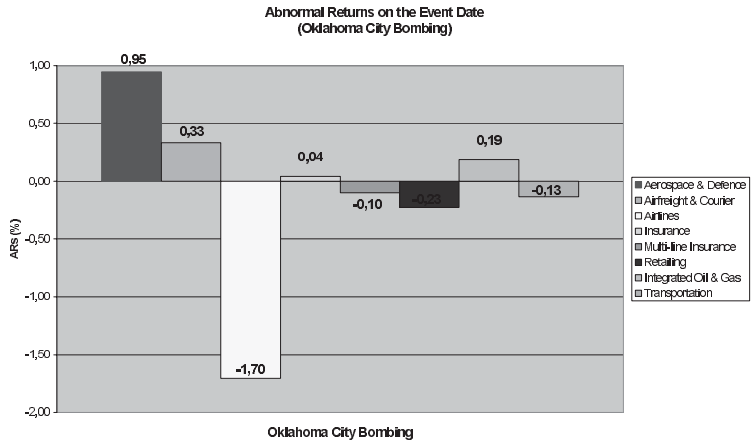
IV. Results and Analysis

The regression analysis that was run for the chosen industries for the Oklahoma City bombing at a 95% confidence level (at the 0.05 level) showed that the aerospace and defence, the airfreight, integrated oil & gas as well as the retailing industry exhibited a beta value of less than one. The rest of the industries exhibited a beta larger than one, except for the casinos & gaming industry which exhibited a non-significant beta, implying that during the studied period it was independent of the trend of S&P500 (see Table 1).

Table 1.

Industry	**Aerospace & Defence**	**Airfreight & Courier**	**Airlines**	**Insurance**	**Multi-line Insurance**	**Casinos & Gaming**	**Retailing**	**Integrated Oil & Gas**	**Transportation**
Code	**SP5IAED**	**SP5IAIF**	**SP5SAIR**	**SP5IINS**	**SP5SMKR**	**SP5SCAS**	**SP5GRET**	**SP5SIOG**	**SP5GTRS**
βeta	0.801	0.644	1.188	1.334	1.584	*Not statistically significant*	0.773	0.391	1.275

Figure 2. Abnormal Returns on the Event Date by Industry.



The AARs that were generated by the Oklahoma City Bombing were negative (-0.0812%). Generally, the ARs generated by this event varied from -1.70% to +0.95%. In particular, of the eight industries that were studied, (since the casino & gaming industry exhibited non-significant beta at a 95% confidence level and consequently it was not included in the group of the examined ones), four industries experienced negative abnormal returns (ARs) on the event date while the rest exhibited positive ARs. In particular, the aerospace & defence industry exhibited the largest positive AR (0.95%) while the airlines industry experienced the largest negative ARs (-1.70%) (see Figure 2). Of the eight industries, five experienced negative 7-day CARs while four experienced negative 14-day CARs. In particular, the transportation industry as well as the retailing, multi-line insurance, insurance and the airfreight & courier industry experienced negative 7-day CARs, while the same industries (excluding multi-line insurance) experienced 14-day negative CARs.

It is worth noting that the transportation, retailing and the airfreight & courier industries experienced larger negative CARs at the end of the 14-day period which probably indicates that within the post-event window these industries continued to be negatively affected by new information. Of the eight industries, three exhibited positive 7-day

Figure 3. 7-day Cumulative Abnormal Returns.

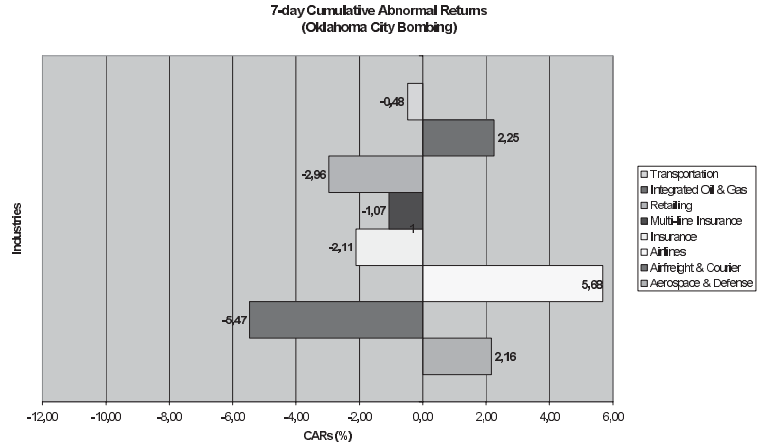
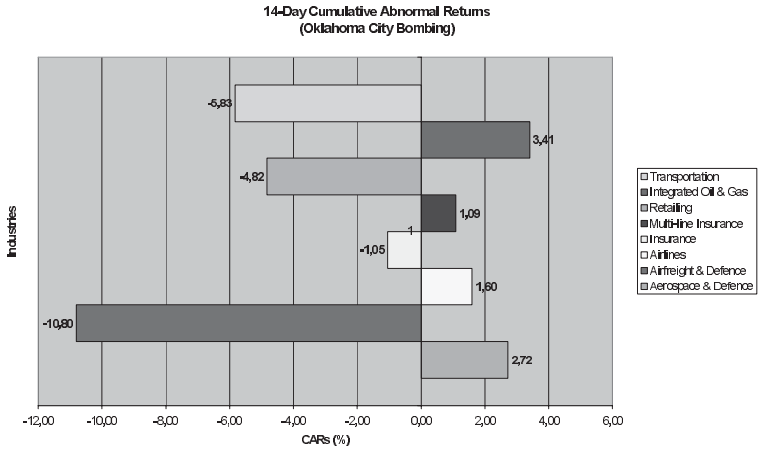


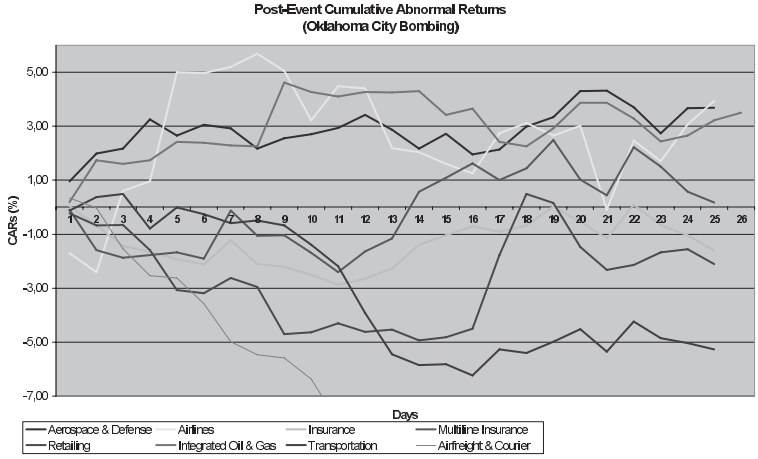
Figure 4. 14-day Cumulative Abnormal Returns.



CARs and four experienced positive 14-day CARs (Figures 3 and 4).

Following Oklahoma's terrorist attack, the airfreight & courier industries remained down for 103 days. In addition, the insurance and the retailing industry rebounded after 18 and 17 days, respectively, whilst the multi-line insurance rebounded within 17 days. In contrast, the airlines and the

Figure 5. Post Event Cumulative Abnormal Returns.

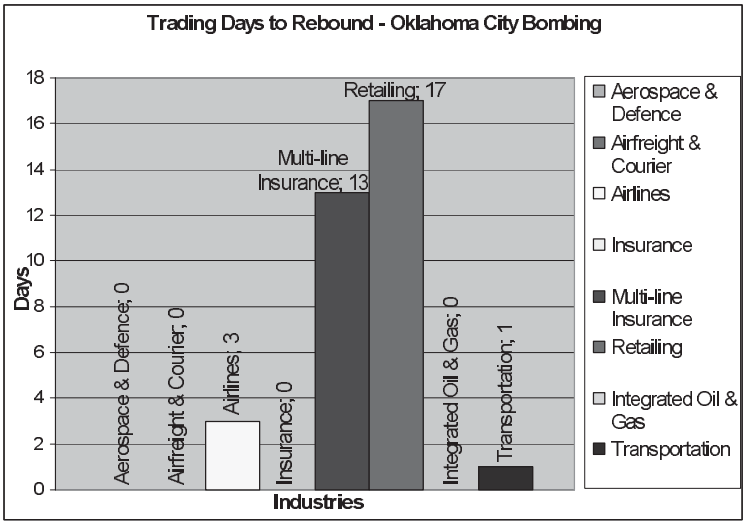


transportation industries recovered within the first 3 days. The remaining industries seemed not to be affected by the terrorist attack since they did not exhibit negative ARs on the event date. Graphically, the number of days that it took for each industry to rebound is indicated by the point at which the CAR line of each industry meets the x-axis (see Figure 5).

Due to the Oklahoma City bombing the airlines, the multi-line insurance as well as the retailing industry and the transportation one generated negative ARs. The largest negative ARs were exhibited by the airlines, followed by the retailing industry, the transportation and the sector of multi-line insurance. The aerospace & defence industry, the airfreight & courier as well as the insurance and integrated oil & gas industry were not negatively affected on the event date since they generated positive ARs on the event date.

In more detail, the retailing industry recovered within the next 17 trading days after the Oklahoma City bombing while the multi-line insurance and the airlines recovered after 13 and 3 trading days respectively. The aerospace & defence industry, the airfreight & courier, the insurance as well as the integrated oil & gas industry did not exhibit negative ARs on the event date and consequently we conclude that it

Figure 6. Trading Days to Rebound.



took zero trading days to rebound although the second and the third industries exhibited negative CARs two days after the Oklahoma City bombing. The length of the period that it took for each industry to return to its pre-attack levels is presented graphically in Figure 6.

It is worth mentioning the unexpectedness of the reaction of the retailing industry due to this terrorist attack, given that it recovered after 17 days. The Oklahoma City bombing was not expected to damage the retailing industry since given rationality, an investor could forecast that the consumers' fundamental needs for food and clothing would not be reduced due to such an unexpected event, with such limited effects in terms of human and capital loss.

These surprising results seem to confirm the argument of the studies in behavioral finance which claims that investors do not always react as expected, but tend to overreact to sudden and dramatic news. Hence, they do not always make rational decisions. Similar conclusions for overreaction can also be drawn for the reaction of the multi-line insurance industry (13 days to rebound), since it should be expected that terrorist events increase the feeling of insecurity in a personal, business and governmental range. This stresses the

need for additional insurance services which will increase the share prices of this industry to higher levels in the short and long term.

V. Summary and Concluding Remarks

This study examined the market reaction in selected industries listed on the NYSE to the announcement of the Oklahoma City bombing on the 19th of April 1995. The methodology followed was the typical even study methodology. The results indicated that there were observed negative abnormal returns on the even date in four out of the eight chosen industries. The airline industry experienced the largest negative ARs (-1,70%), while the aerospace and defense industry experienced the largest positive ARs (0,95%). Hence, we conclude that not all industries have the same sensitivity and recovery speed to unexpected unpleasant events.

In order to be able to generalise our inferences, more similar events, terrorist attacks, should be examined that have occurred either in the U.S.A. or elsewhere and we could classify and study them, distinguish similarities and differences among the events and compare the market's reaction in each case to gain more insights.

References

Barrett, B.W., Henson, A.J., Kolb, R.W. and Schropp, G.H. (1987), "The Adjustment of Stock Prices to Completely Unanticipated Events", *The Financial Review*, 22, (4), (November 1987), 345-354.

Brooks, R.M., Patel, Ajay and Su Tie (2003), "How the Equity Market Responds to Unanticipated Events", *Journal of Business*, 76, (1), 109-133.

Brown, S.J. and Warner, J.B. (1985), "Using Daily Stock Returns. The Case of Event Studies", *Journal of Financial Economics*, 14, 3-31.

Carter, D.A. and Sinkins, B.J. (2004), "The Market's Reaction to Unexpected, Catastrophic Events: The Case of Airline Stock Returns and the September 11th Attacks", *The Quarterly Review of Economics and Finance*, 44, (4), (September 2004), 539-545.

Chen, A.H. and Siems, T.F. (2002), " An Empirical Analysis of the Capital Market's Response to Cataclysmic Events", on line at diw.de/deutsch/produkte/…/docs/diw_ws_consequenses200206_siems.pdf

Chen, A.H. and Siems, T.F. (2004), "The Effect of Terrorism on Global Capital Markets", *European Journal of Political Economy*, 20, 349-366.

DeBondt, W.F. and Thaler, R. (1985), "Does the Stock Market Overreact?" *The Journal of Finance*, XL, (3), July 1985, on line at www.jstor.org/view/00221082/di991998/99p0506i/0

Drakos, K, (2002), "Terrorism Induced Structural Shifts in Financial Risk: Airline Stocks in the Aftermath of the 11th September Terror Attacks", *European Journal of Political Economy*, on line at http://econpapers.repec.org/article/eeepoleco/v_3A20_3Ay_3A2004_3Ai_3A2_3Ap_3A435-446.htm

Fama, E. (1970), "Efficient Capital Markets: A Review of the Theory and Empirical Work", *Journal of Finance*, 25, 383-416.

Henderson, G.V. Jr. (1990), "Problems and Solutions in Conducting Event Studies", *The Journal of Risk and Insurance*, 57, (2), (June 1990), 282-307.

MacKinlay, A. G. (1997), "Event Studies in Economics", *Journal of Economic Literature*, 35, (1), (March 1997), 13-40.

Maloney, M. and Mulherin, H.(1998), "The Stock Price Reaction to the Challenger Crash", papers.ssrn.com/so13/papers.cfm?.cfid=155086&cftoken=319884928, December 7,1998.

Thompson, F.A., Zaman, M.A. and Kirmani, S.N. (1994), "Differential Analysis of the Impact Catastrophic Loss has on Publicly Traded Property / Casualty Insurers", *Journal of Insurance Regulation*, 12 (4), 67-85.

1. Aerospace & Defence

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,097	,065		1,489	,141
	S&PCOMP	,801	,151	,544	5,302	,000

a. Dependent Variable: SP5IAED

2. Airfreight & Couriers

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,086	,138		,624	,535
	S&PCOMP	,644	,318	,240	2,027	,047

a. Dependent Variable: SP5IAIF

3. Airlines

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	,147	,189		,775	,441
	S&PCOMP	1,188	,437	,315	2,717	,008

a. Dependent Variable: SP5SAIR

4. Insurance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-,043	,068		-,627	,533
	S&PCOMP	1,334	,157	,719	8,468	,000

a. Dependent Variable: SP5IINS

5. Multi-line Insurance

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-,070	,104		-,670	,505
	S&PCOMP	1,584	,241	,626	6,577	,000

a. Dependent Variable: SP5SMKR

6. Casinos & Gaming

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,725	,318		2,277	,026
	S&PCOMP	-,661	,735	-,109	-,899	,372

a. Dependent Variable: SP5SCAS

7. Retailing

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,011	,080		,141	,888
	S&PCOMP	,773	,185	,455	4,177	,000

a. Dependent Variable: SP5GRET

8. Integrated Oil & Gas

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,061	,069		,878	,383
	S&PCOMP	,391	,161	,285	2,436	,018

a. Dependent Variable: SP5SIOG

9. Transportation (SP5TRS)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,019	,084		,222	,825
	S&PCOMP	1,275	,194	,627	6,590	,000

a. Dependent Variable: SP5GTRS