

Terror-Related Events and Stock Returns

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I. INTRODUCTION

On July 28, 2003, the U.S. Defense Advanced Research Projects Agency (DARPA) unveiled its Policy Analysis Market (PAM). PAM would have created a place for individuals to trade futures contracts linked to political events in the Middle East. Within a day, the project, which would have included contracts for terrorist attacks and assassinations, was cancelled under extreme political pressure. However, despite this setback, prediction markets have continued to grow over time. Some markets, such as Tradesports.com, offer contracts based on political events in both the U.S. and the Middle East. For example, prior to and during the war in Iraq, Tradesports offered contracts linked to the capture of Saddam Hussein. Many of these contracts take the form of “all-or-nothing” options that pay a set amount if and only if the stated event occurs before expiration.

While prediction markets have become more popular, their trading volume is low compared with that of major exchanges. However, according to Wolfers and Zitzewitz (2006), “some envision prediction markets as the first step toward markets where participants could hedge their exposure to political and economic events.” For instance, contracts similar to those intended for the failed DARPA project could be used to hedge against terrorism and other political events. In order to gauge the potential viability of such contracts, this study seeks to determine the risk exposure of two industries, airlines and defense firms, to terrorist attacks and other related events. Specifically, the hypothesis to be tested is that airline stocks are subject to abnormal negative returns on the date of such events, while defense firms experience abnormal positive returns.

II. PREVIOUS RESEARCH

Since the attacks of September 11, 2001, several studies have explored the effects of terrorism on financial markets. The previous work has focused primarily on terrorist

incidents which meet the criteria, defined by Title 22 of the United States Code, Section 2656f(d), as “premeditated, politically-motivated violence perpetrated against non-combatant targets by subnational groups or clandestine agents, usually intended to influence an audience.”

Karolyi and Martell (2006) performed an event study consisting of 75 separate attacks targeting publicly traded companies. They found that even when September 11 is excluded, the target firms experienced an abnormal return of -0.83% on the day of the attack (or subsequent trading day). In addition to examining companies that were targeted by the attack, they also studied peer firms in the same industry and found no significant abnormal returns, leading them to conclude that either “investors do not believe that growth opportunities lost by targeted firms...are captured by competitors within the same industry” or benefits to competitors (positive effect) are offset by a perception of higher terror risk within the industry (negative effect).

Berrebi and Klor (2006) focused specifically on the Israeli-Palestinian conflict and its effect on Israeli companies. Their results show no significant effect on the overall stock market as a result of terrorist attacks. However, they looked beyond this result and analyzed the effects of terrorism on different industries. They found that the second Palestinian uprising accounted for abnormal returns of +7% for defense firms and -5% for all other companies between September 29, 2000 and September 10, 2001.

While our study analyzes the same themes and uses similar techniques as previous work, it is unique in two ways. First, like Berrebi and Klor, we attempt to determine the effects of terrorism on specific industries, but the focus is on U.S. companies. Second, our research expands beyond perpetrated attacks and studies the impact of other exogenous terror-related events, specifically changes in the Department of Homeland Security’s (DHS)

National Threat Advisory System and taped messages released by al-Qaida leader Osama bin Laden.

Such events are of interest because they may contain information about potential attacks and therefore may impact financial markets. Their inclusion in the study is consistent with Karolyi and Martell's assertion that a company's stock price might react to attacks due to "the fact that costs incurred by the firm in the continuation of its normal activities differ from those before the attack(s)." One might expect that official warnings or threats from terrorist groups could have similar consequences. For instance, an elevation in the threat level may result in more extensive and costly security procedures or lower revenues from decreased passenger traffic.

The inclusion of non-attack events is also consistent with the decision to study entire industries rather than specific firms. While a specific company may be targeted in an attack, this is often not the case with terror threats and warnings. Therefore, it is more appropriate to study the impact of such occurrences on entire industries.

III.INDUSTRY SELECTION

This study focuses on the stock price reactions to terror-related events for firms in the airline and defense sectors. These particular industries have been chosen because they are perceived to have a significant exposure to such events.¹

Airlines

The airline industry, in particular, has been a focus of numerous terrorist attacks and related events. While the September 11 attacks are the most notable example, commercial airliners have been targets in past attacks, and the industry has continued to be the focus of

¹ Though this study focuses on just two industries, a number of sectors may be disproportionately affected by terrorism, including hotels, travel, and tourism.

terrorist threats and DHS warnings in recent years. Most recently, a plot to attack ten transatlantic flights to the U.S. was uncovered in London in August 2006.

With each incident analysts have speculated about the impact on the airline industry. For example, a Salomon Smith Barney Industry Note following the “unprecedented” attacks of September 11 warned of a potential year-long effect on revenues and more permanent changes to airlines’ cost structures due to increased security precautions. The note also speculated that the magnitude and nature of the attacks would result in a more widespread geographic impact than previous events, such as the bombing of Pan Am flight 103 and the first Gulf War, which primarily affected transatlantic travel. However, this report also noted that the impact of terrorism is often overshadowed by other factors, as was the case when airlines outperformed the S&P 500 in the twelve months following the 1988 Pan Am bombing on the strength of record revenues and earnings.

A 2006 report from Cathay Financial posits that attacks since September 11 have had an increasingly smaller effect on airline traffic over time. After repeatedly viewing images of terrorism and war, travellers may become desensitized to threats, helping to explain the limited effects of terrorism on air traffic.

Finally, an equity research report from Credit Suisse downplays the long-term affects of non-attack events, such as elevations in the DHS threat level. According to the report, on average, airline stock prices were down only 1% on the day of such announcements and recovered quickly thereafter. The report concludes that factors such as fuel prices and the overall economic outlook have a bigger effect on the sector than do fears about terrorism. Like Cathay Financial, this report also notes a possible desensitization to terror warnings over time, as exhibited by smaller negative reactions with each successive warning.

Defense

While airlines may face increased risk from terrorism, the defense industry has been identified as a sector that may benefit from such events. This was the finding of Berrebi and Klor (2006) when examining Israeli defense stocks. Analysts have also considered the potential impact on this sector. Following the foiled London-based airline plot in 2006, reports from Jefferies & Company and Prudential Equity Group noted the potential effect on defense firms. The Prudential report speculated that the plot, which involved the use of explosive agents hidden in liquid carry-on containers, exposed a potential gap in current detection technology and therefore could lead to increased spending on upgraded equipment. However, the Jefferies report cautions that such an impact could be minimal, as increased security spending had been in the pipeline for some time before the plot was discovered.

IV. DATA

Events

For this study, a total of 34 events were selected and classified in the following three categories. See Table A-1 in the appendix for a list of events in each category.

- 1) Major terror attacks or plots targeting American interests, either within the U.S. or abroad. These events were selected from *The World Almanac and Book of Facts* list of Notable Terrorist Incidents beginning with the bombing of Pan Am flight 103 in 1988. This category also includes other significant airline-related events, including thwarted attacks and crashes that were initially perceived to be related to terrorism.
(twelve events)

- 2) Elevations in the DHS National Threat Advisory System, including elevations targeting specific geographic regions or transportation sectors.² Official warnings that did not result in a threat elevation were also included. The list was compiled from official press releases issued by the DHS or The White House. (ten events)
- 3) Releases of taped messages by al-Qaida leader Osama bin Laden. A timeline of these recordings, along with a summary of the message, was taken from the English-language website of the Al Jazeera network. (twelve events)

Securities

Security prices for U.S.-based commercial air travel and defense firms that were publicly traded at any point during 1988-2006 (the timeline encompassing all of the selected events) were obtained from the CRSP database. Air travel companies with a SIC code classification of 4510, 4511, 4512, or 4520 were selected. No distinction was made between domestic-only carriers and those with international routes. This seemed appropriate given that the September 11 attacks targeted domestic routes within the U.S., demonstrating that all airlines are exposed to terror-related risk. The list of defense firms was compiled from those highlighted in the Jefferies and Prudential analyst reports. A full list of companies included in the study is found in Table A-2 in the appendix.

V. METHODOLOGY

In an attempt to determine the precise impact of the selected events on airline and defense firms, we have performed a series of event studies. The goal of an event study is to measure abnormal returns for one or more stocks as a result of a particular event.

² While this study considers only threat elevations, one might expect that reductions in the DHS threat level would have the opposite effect of increasing returns for airlines and decreasing them for defense firms. However, this effect could be mitigated by the fact that the perception of the general threat level may have diminished even before the official reduction, which would then be a formality.

Market Model Estimation

The first step is to estimate expected returns based on stock price data during a window of time prior to the event. Returns during this *estimation window* are regressed against the overall market to obtain the following equation:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where R_{it} and R_{mt} are the returns on security i and the market, respectively, in period t . α_i and β_i are the parameters of the market model. ε_{it} is the zero mean disturbance term. Dates during the *event window* are indexed using the symbol τ , with the event date itself at $\tau = 0$. The abnormal return for security i on a given day τ during the event window is denoted by $AR_{i\tau}$, which takes the place of the disturbance term in the previous equation. Solving for $AR_{i\tau}$ we have:

$$AR_{i\tau} = R_{i\tau} - \hat{\alpha}_i - \hat{\beta}_i R_{m\tau}$$

where $R_{i\tau}$ and $R_{m\tau}$ are the actual returns for the security and market, respectively. The hats above the market model parameters indicate that they are approximated from the estimation window observations using ordinary least squares (OLS). Under the null hypothesis the expected value for $AR_{i\tau}$ is zero. For more information regarding event study methodology, see MacKinlay (1997) or Karolyi and Martell (2006).

Study Parameters

The Eventus software provided by Wharton Research Database Services (WRDS) was used to perform the studies described in this paper. An estimation window of 255 days, ending 21 days prior to the event, was used to obtain the market model parameters, with the S&P 500 serving as the benchmark index. If an event occurred after the markets closed in the U.S. or on a non-trading day, the subsequent trading day was used as the event date. For each event date, Eventus analyzed only those firms with a sufficient amount of stock return data

over the estimation and event windows. For example, JetBlue was not included in the analysis of the Pan Am flight 103 bombing, while Pan Am was excluded when looking at the more recent changes in the DHS threat level.

Test Statistics

The potential for cross-sectional correlation of the returns was of concern in interpreting the results. A benefit of observations with non-overlapping estimation and event windows is that idiosyncratic stock price movements that occur during the estimation and event windows are “washed out,” leaving “abnormal returns that truly capture the economic impact of the event on stock prices” (Karolyi and Martell, 2006). However, in this study the effect of a particular event on all firms in a single industry is considered. As a result, all observations for the event have coinciding estimation and event windows, leading to a high correlation of returns between firms. Collins and Dent (1984) show that ignoring this effect produces results in which the computed test statistic is larger than it would have been if the returns are independent. This may result in a bias towards rejection of the null hypothesis. This issue was addressed within the constraints of the WRDS Eventus software by relying on the Crude Dependence Adjustment (CDA) test statistic, which, according to the software manual, “avoids the potential problem of cross-sectional correlation of security returns.”

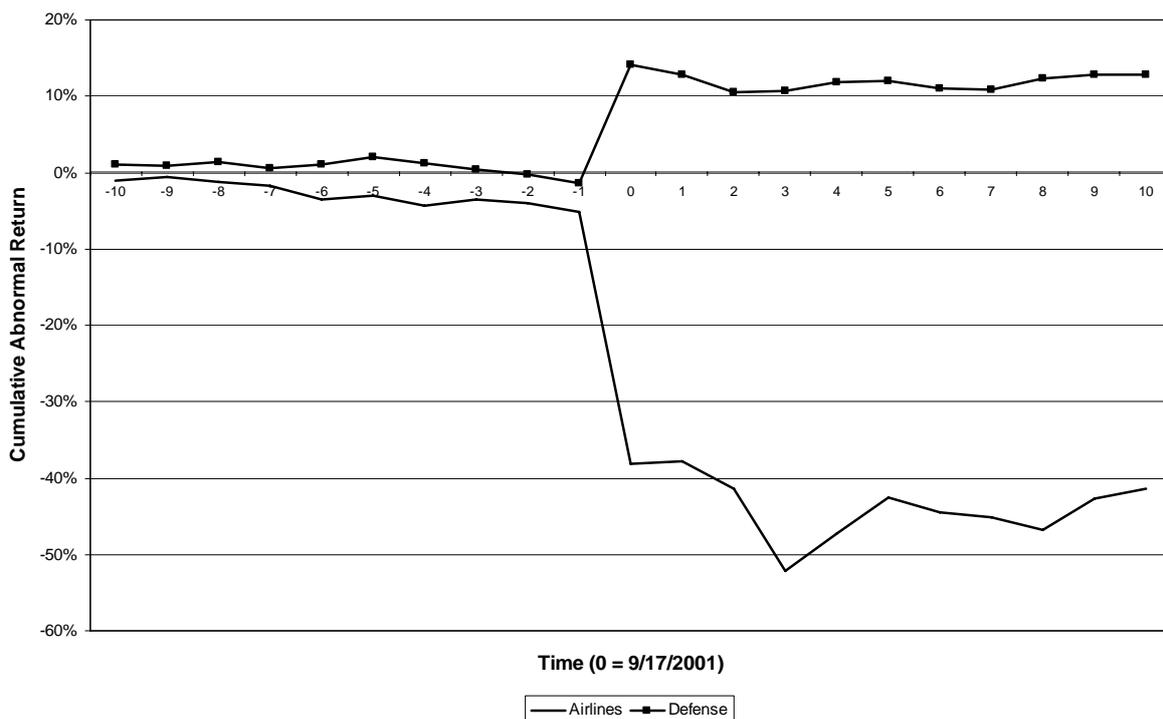
VI. SUMMARY OF RESULTS

The studies were done in two stages. In the first, the events were aggregated in single studies for each of the three categories. The goal was to determine if these types of events have a statistically significant impact on returns. In the second stage, a separate study was done for the each individual event. The purpose of looking at each event on its own was to judge if abnormal returns are related to the precise nature of an individual event or threat. Factors that may influence the magnitude of abnormal returns are the severity of an event or a

specific focus on air travel or the U.S. homeland. One may expect that events of this nature would have a bigger impact, particularly on airline stocks. This approach may also determine if the abnormal returns are diminishing over time as Americans become desensitized to terrorism.

Due to the magnitude of the September 11 attacks, they were not included in the study of successful terrorist attacks (Category 1). Instead, a separate study was done to determine the abnormal returns associated with this event. The results are in line with the hypothesis that a terrorist attack would cause abnormal negative returns for airlines stocks and positive returns for defense stocks. On the first trading day following the attacks, September 17, 2001, airline stocks posted an abnormal return of -33.0%, while defense stocks had an abnormal return of +15.5%. Both numbers are significant at the 0.1% level. The following graph depicts the cumulative abnormal returns over an event period beginning ten days before and extending ten days after the event date.

Figure VI-1: Effects of September 11, 2001 Attacks on Airline and Defense Stocks



Category-Level Results

The following table summarizes the mean abnormal returns for each industry on the event date for each event category. Boldface type indicates abnormal returns that are significant at at least a 5% level and have the expected sign (negative for airlines; positive for defense). The results indicate statistically significant abnormal returns on the event date in certain categories.

Table VI-1: Event Date Abnormal Returns for Aggregated Event Categories

Category	<i>Airlines</i>		<i>Defense</i>	
	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t
(1) Terrorist Attacks	-0.73%	-1.692*	0.11%	0.318
(2) Threat Elevations	-1.03%	-1.652*	0.12%	0.395
(3) al-Qaida Warnings	-0.15%	-0.263	-0.45%	-1.62\$

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

As expected, on the dates of terrorist attacks and threat elevations, firms in the airline industry earned negative abnormal returns that were significant at the 5% level. The results also show abnormal returns for defense stocks on dates when taped al-Qaida warning messages were released. However, these returns were negative rather than positive. Further, an examination of all days in the event windows for the categories reveals significant abnormal returns on days other than the event date. For example, airline stocks exhibit an abnormal return of +1.86% on the eleventh day ($\tau = +11$) following the release of messages by al-Qaida while defense stocks had an abnormal return of -1.14% fourteen days ($\tau = -14$) prior to terrorist attacks. Both results are significant at the 0.1% level. (See Table A-3 in the appendix for a complete listing of abnormal returns and t statistics for each day in the event

window.) Because the timing of these returns relative to the event date is arbitrary and because each category contains a small number of events, it is possible that a single abnormal return for one of the events influenced the results of the entire category. The next section will further discuss abnormal returns for each individual event observation.

Event-Level Results

In order to determine the source of unexpected returns within the category-level results, a separate study was done for each individual event. This will also provide information regarding the pattern of abnormal returns for specific events rather than just categories of events. Such an approach may be more appropriate when dealing with terrorism because each event is unique. For instance, terrorist attacks may differ in location, target, and scale. Elevated threat levels and al-Qaida warning messages may also differ in their subject and tone. As a result, it may be problematic to combine all events in a particular category into a single study. Considering each separately may allow us to make determinations regarding the impact of different events based on content and across time.

Attacks and Other Significant Events

In addition to the September 11 attacks, eleven major terrorist attacks or airline crashes were studied. The crashes were included because their causes were initially suspicious. The thwarted shoe bombing of a Paris-to-Miami flight in December 2001 is also included in this set of events. The following table shows abnormal returns for each event date. Again, boldface type indicates observations that are statistically significant at a 5% level and have the expected sign.

Table VI-2: Event Date Abnormal Returns for Individual Terror Attacks

Event Date ¹	<i>Airlines</i>		<i>Defense</i>	
	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t
12/22/1988	-0.41%	-0.450	-0.53%	-0.528
2/26/1993	0.91%	0.677	0.38%	0.371
4/19/1995	2.16%	1.756*	-0.32%	-0.361
11/13/1995	-0.06%	-0.045	-0.36%	-0.462
6/25/1996	-1.58%	-1.362\$	0.44%	0.644
7/18/1996	-1.30%	-1.165	0.57%	0.845
8/7/1998	2.23%	2.011*	1.47%	2.023*
11/1/1999	-0.37%	-0.232	-1.71%	-1.717*
10/12/2000	-1.95%	-1.569\$	0.80%	0.588
11/12/2001	-5.67%	-2.168*	-0.61%	-0.422
12/24/2001	-2.68%	-0.965	0.82%	0.555

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

¹If the event occurred while the U.S. financial markets were closed, the subsequent trading day was used as the event date.

For airlines, the only significant negative abnormal return occurred following the crash of American flight 587 on November 12, 2001. This crash occurred shortly following September 11, and terrorism was initially considered as a possible cause. Airline stocks rebounded in the following days when the probable cause was determined to be structural.

Four of the events in this group are specifically associated with air travel: the bombing of Pan Am flight 103 on December 21, 1988, the crash of TWA flight 800 on July 17, 1996, the crash of American flight 587, and the attempted shoe bombing on December 22, 2001. All four resulted in negative abnormal returns for airlines, though only the American crash was statistically significant.

Among defense stocks, only the simultaneous bombings of U.S. embassies in Kenya and Tanzania on August 7, 1998 resulted in significant positive abnormal returns.

Overall, this group of events does not support the hypothesis that terrorist attacks result in abnormal returns that are negative for airlines and positive for defense firms. Only two out of 22 total observations exhibit such returns.

DHS Threat Elevations and Warnings

Since unveiling the DHS Threat Advisory System on March 12, 2002, the government has raised the threat level from Elevated to High several times and has also issued official warnings on other occasions. Ten such events were analyzed for both airlines and defense stocks. The following table summarizes the results.

Table VI-3: Event Date Abnormal Returns for Individual Threat Elevations

Event Date ¹	<i>Airlines</i>		<i>Defense</i>	
	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t
9/10/2002	-1.28%	-0.461	-1.21%	-0.806
2/7/2003	-1.15%	-0.550	0.05%	0.041
3/17/2003	0.08%	0.038	1.56%	1.318\$
5/20/2003	-1.36%	-0.591	-0.97%	-0.828
12/22/2003	-1.58%	-0.755	-0.62%	-0.728
5/26/2004	0.20%	0.118	0.18%	0.241
7/8/2004	-2.47%	-1.544\$	0.52%	0.683
8/2/2004	-2.35%	-1.527\$	0.77%	0.995
7/7/2005	-0.90%	-0.592	0.22%	0.277
8/10/2006	0.83%	0.566	0.76%	1.218

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

¹If the event occurred while the U.S. financial markets were closed, the subsequent trading day was used as the event date.

None of these events resulted in abnormal returns that are significant at the 5% level for either airlines or defense firms. However, two of the threat elevations resulted in negative returns for airlines that were significant at the 10% level. Further, airlines had negative returns for seven of the events, which may explain why the category-level study for DHS warnings resulted in significant negative abnormal returns.

These results were mixed regarding the impact of threat elevations that specifically mention air transportation as a potential target. Of the four such events (December 22, 2003, May 26, 2004, July 8, 2004, and August 10, 2006) two had positive abnormal returns, while two were negative.

These observations also do not reveal a clear pattern of abnormal returns over time. The largest abnormal returns for airlines came in the summer of 2004, nearly three years after September 11.

Taped Messages from al-Qaida

Since the attacks of September 11, al-Qaida leader Osama bin Laden has released several video and audio recordings. A summary of abnormal returns following the release of twelve such messages is shown in the table below.

Table VI-4: Event Date Abnormal Returns for Individual al-Qaida Messages

Event Date ¹	<i>Airlines</i>		<i>Defense</i>	
	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t	Mean Abnormal Return ($\tau = 0$)	Portfolio Time-Series (CDA) t
12/13/2001	0.74%	0.269	0.28%	0.187
10/7/2002	-1.25%	-0.433	-0.58%	-0.381
2/12/2003	1.12%	0.541	-0.32%	-0.269
4/7/2003	5.84%	2.880@	-0.25%	-0.212
9/10/2003	-0.28%	-0.116	-0.82%	-0.760
1/5/2004	-2.18%	-1.050	-0.13%	-0.158
4/15/2004	-1.32%	-0.658	-0.06%	-0.077
5/6/2004	-1.20%	-0.651	-0.76%	-0.999
10/29/2004	-3.34%	-2.221*	-1.30%	-1.763*
12/16/2004	-0.28%	-0.174	-0.52%	-0.700
12/27/2004	1.66%	1.033	-1.02%	-1.379\$
1/19/2006	-0.62%	-0.479	0.09%	0.127

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

¹If the event occurred while the U.S. financial markets were closed, the subsequent trading day was used as the event date.

These results reveal only one observation that supports our hypothesis, an abnormal return of -3.34% for airline stocks following a taped message on October 29, 2004 that is significant at the 5% level. This particular message referenced the September 11 attacks but made no specific threats against air travel. On this same date, defense stocks also have a significant abnormal return of -1.30%, which does not support our hypothesis.

No other observations exhibit abnormal returns with the expected sign, though airline stocks did register a positive abnormal return that was significant at the 1% level after bin Laden's April 7, 2003 message urging attacks against U.S. and British interests.

Once again, these event studies do not show any patterns that would indicate a diminishing impact of terrorism over time.

In many of the event-level studies, the results are further complicated by large abnormal returns that occur several days either before or after the event date. For example, in the case of the October 29, 2004 message from Osama bin Laden, airline stocks had an abnormal return of -3.34% on the event date ($\tau = 0$) and an abnormal positive return of 5.52% eleven days ($\tau = +11$) after the tape was released. While the former return is significant at the 5% level, the latter is significant at the 0.1% level. This observation was largely responsible for the previously mentioned significant abnormal return of +1.86% on day eleven for the category-level study of al-Qaida messages. (See Tables A-4 – A-9 in the appendix for a listing of daily abnormal returns and test statistics for each individual event.) The eleventh trading day following October 29, 2004 was November 15, 2004. On that day, when the S&P 500 was down -0.03%, airline stocks rose sharply as crude-oil prices fell to their lowest level in two months. Even the cause of the abnormal return on the event date of October 29 is debatable. While a message from bin Laden was released on that day, the days preceding October 29 had been marked by increases in airline stocks that resulted from falling crude oil

prices and Delta Air Lines' efforts to avoid bankruptcy. The negative returns on the event date may have been more a reversal of previous gains than a reaction to the taped message.

VII. CONCLUSIONS

Impact of Terror-Related Events on Stock Returns

Given the results of the studies performed both at the category-level and event-level it is not possible to reject the null hypothesis that terrorist attacks or threats do not lead to abnormal returns in the airline and defense industries. The most compelling argument in favor of rejecting the null hypothesis for the airline industry is the fact that category-level studies showed statistically significant negative abnormal returns on the event date for Category 1 (attacks and other significant events) and Category 2 (DHS threat elevations.) However, further analysis at the event-level does not support the alternate hypothesis that terrorism has a consistent and significant impact on returns in the airline and defense sectors.

The relatively small number of events in each category makes it possible that a single event could influence the overall results. For example, in the case of the results for Category 1, a large negative return for airlines on November 12, 2001, the day of the first major incident following September 11, seems to have skewed the results for the entire category. Thus, the insufficient number of observations makes it difficult to measure the generic impact of terrorist attacks, DHS threat elevations, or messages from al-Qaida.

The case of the October 29, 2004 al-Qaida message demonstrates the impact of events unrelated to terrorism on the study. Here, a separate factor, the price of crude-oil, impacted the returns for airlines within the event window. This shows the pitfalls of studying a single event. Because all observations are centered on a single calendar date, idiosyncratic price movements are not "washed out" as Karolyi and Martell suggest. While this is a limitation of the study, it may help to disprove the theory that terrorism-related events result in abnormal

stock returns. If the presence of large abnormal returns on random days in the event window indicates that airline prices are sensitive to exogenous factors, such as the price of oil, then the lack of significant abnormal returns on nearly all of the actual event days seems to suggest that terrorism is not such a factor.

Implications for Terror-Linked Futures Contracts

Our results indicate that futures contracts linked to terrorism would not be viable as widely-traded hedging instruments. According to Black (1986), several factors are necessary to make a commodity futures contract successful. These same characteristics can be applied here. First, there must be large variations in the price of the asset of being hedged, in this case, airline and defense stocks. Otherwise, there would be little need to insure against price changes. Second, the cash market for these assets must be large enough to attract an adequate number of participants. Finally, use of the contract must provide an efficient “cross hedge” that reduces risk exposure enough to compensate for liquidity costs.

While publicly traded airline and defense stocks are likely to meet the first two criteria of price volatility and cash market size, we have shown that contracts linked to broad categories of terror-related events likely would not provide a significant hedge against risk for these sectors. In addition, these events are heterogeneous, with each attack, threat elevation, or warning message having different characteristics. This makes it difficult to design a standardized contract that captures the relationship between terrorism and stock returns. On the other hand, contracts that are tailored to industries, locations, or types of terrorism may provide a better hedge against specific types of risk but would be less liquid.

There are several other obstacles for futures contracts linked to terrorism. First, it is difficult to measure the costs of terror or to determine if an event has even occurred in the first place. Must an attack pass a certain threshold of human or property loss in order for the event to be triggered? Should an official warning from the Department of Homeland Security

trigger an event, even if the threat level is not elevated? When an event does occur, it may be difficult for firms to determine their exposure. For example, airlines must consider not only property loss, but also decreased revenues and increased security costs resulting from an attack or threat elevation. However, such costs are entirely dependent on the nature of the event. These unknowns would make it difficult to price the contracts or determine how many contracts were needed to hedge an exposure. An interesting counter-example is that of weather derivatives, which have become widely traded on major exchanges such as the Chicago Mercantile Exchange (CME). Like terrorism, weather poses a risk to many different sectors of the economy. However, in the case of weather derivatives, it has been possible to base contracts on an easily measurable statistic: the deviation of actual temperatures from a predetermined average. Further, companies are able to measure the effect of abnormal temperatures on their business.

Second, as the failure of DARPA's Policy Analysis Market shows, the moral dilemma associated with terror-linked contracts cannot be ignored. Should such contracts become widely traded as hedging instruments, it is likely that others would use them to speculate on the occurrence of terrorism. In fact, according to Black, speculators help to provide the liquidity necessary for successful contracts. However, she also notes that both hedgers and speculators are reluctant to participate in a market that is easily manipulated. There is a concern here insofar as widely traded terror contracts could be used by the terrorists themselves to profit from their actions.

While the ability of prediction markets and terror-related contracts to foresee future events remains a popular topic, the lack of a clear link between terrorism and stock returns and the challenges involved in contract design make it unlikely that these contracts would be successful on major derivatives exchanges.

APPENDIX

Table A-1: Terror-Related Events

Date	Event Date¹	Description	Air Travel²	Homeland³
(1) Attacks and Other Significant Events⁴				
12/21/1988	12/22/1988	Bombing of Pan Am flight 103; linked to Libya	Yes	No
2/26/1993	2/26/1993	Truck bombing of World Trade Center; linked to al-Qaida	No	Yes
4/19/1995	4/19/1995	Truck bombing of Federal Building in Oklahoma city bombed; linked to domestic terrorism	No	Yes
11/13/1995	11/13/1995	Bombing of U.S. military compound in Saudi Arabia; linked to Islamic Movement of Change	No	No
6/25/1996	6/25/1996	Truck bombing of U.S. military complex in Dhahran, Saudi Arabia	No	No
7/17/1996	7/18/1996	Crash of TWA flight 800; terrorism suspected, but crash was determined to be an accident	Yes	Yes
8/7/1998	8/7/1998	Simultaneous bombings of U.S. embassies in Kenya and Tanzania; linked to al-Qaida	No	No
10/31/1999	11/1/1999	Crash of EgyptAir flight 990 after takeoff from JFK; suspected pilot suicide	Yes	Yes
10/12/2000	10/12/2000	Bombing of USS Cole while docked in Yemen; linked to al-Qaida	No	No
9/11/2001	9/17/2001	September 11 attacks on New York, Washington, DC, and Pennsylvania	Yes	Yes
11/12/2001	11/12/2001	Crash of AA flight 587 after takeoff from JFK; cause later determined to be mechanical	Yes	Yes
12/22/2001	12/24/2001	Attempted shoe-bombing of flight bound for Miami from Paris	Yes	Yes
(2) DHS Threat Elevations and Warnings⁵				
9/10/2002	9/10/2002	Raised around the first anniversary of 9/11/2001	No	Yes
2/7/2003	2/7/2003	Raised due to threats against hotels, apartment buildings, and other "soft" targets around the end of Hajj	No	Yes
3/17/2003	3/17/2003	Beginning of U.S. military actions in Iraq; fears of retaliation worldwide by Iraqi agents and sympathizers	No	Yes
5/20/2003	5/20/2003	Raised in response to Riyadh and Casablanca bombings and belief that al-Qaida has entered "operational" period worldwide, including possibly within the U.S.	No	Yes
12/21/2003	12/22/2003	Raised due to intelligence suggesting large-scale attacks around the holiday season; al-Qaida's interest in aircraft highlighted	Yes	Yes
5/26/2004	5/26/2004	Official warning based on-specific intelligence of threats against homeland and intent to affect 2004 presidential election	No	Yes
7/8/2004	7/8/2004	Official warning citing credible evidence of terrorist intent to affect 2004 presidential election; Los Angeles airport is mentioned as a possible target	Yes	Yes

Date	Event Date¹	Description	Air Travel²	Homeland³
8/1/2004	8/2/2004	Raised in response to a reported plot against financial institutions in NY, NJ, and DC with car or truck bombs	No	Yes
7/7/2005	7/7/2005	Raised for mass transit systems only following London Tube bombings though there was no "specific, credible information suggesting imminent attack"	No	Yes
8/10/2006	8/10/2006	Raised to High for all domestic and international flights to or from U.S.; elevated threat level remains in effect as of April 2007	Yes	Yes
(3) Taped Messages from al-Qaida Leader Osama bin Laden⁶				
12/13/2001	12/13/2001	The U.S. defense department releases a video of bin Laden in Afghanistan in November 2001 in which he says that the destruction of the 11 September attacks exceeded even his "optimistic" calculations	No	Yes
10/6/2002	10/7/2002	Al Jazeera broadcasts an audio tape in which a voice attributed to bin Laden says the "youths of God" are planning more attacks against the U.S.	No	Yes
2/11/2003	2/12/2003	Bin Laden calls on Iraqis to carry out bombing attacks against Americans and defend themselves against a U.S. attack in a tape broadcast on Al Jazeera	No	No
4/7/2003	4/7/2003	In an audio tape obtained by The Associated Press in Pakistan, bin Laden exhorts Muslims to rise up against Kuwait, Saudi Arabia and other governments he says are agents of America, and calls for bombers to attack U.S. and British interests	No	No
9/10/2003	9/10/2003	Two taped messages and an accompanying video were released. In one, a voice purporting to be bin Laden's praises the "great damage to the enemy" on 11 September and mentions five hijackers by name. In the other, a voice said to be that of al-Zawahiri threatens more attacks	No	Yes
1/4/2004	1/5/2004	Bin Laden says on an audio tape broadcast on Al Jazeera that the U.S.-led war in Iraq is the beginning of the occupation of Arab Gulf states for their oil. He calls on Muslims to keep fighting in the Middle East	No	No
4/15/2004	4/15/2004	Bin Laden offers a truce to European countries that do not attack Muslims. He vows revenge against the United States for the Israeli assassination of Hamas founder Shaikh Ahmed Yassin	No	No
5/6/2004	5/6/2004	In an online audio tape released on Islamic forums, bin Laden offers rewards of gold for the killing of U.S. and U.N. officials	No	No
10/29/2004	10/29/2004	Al Jazeera broadcasts a video of bin Laden saying the U.S. can avoid another attack like those of 11 September 2001, if it stops threatening the security of Muslims	No	Yes
12/16/2004	12/16/2004	In an audio tape posted on an website, bin Laden exonerates fighters of responsibility for violence in Saudi Arabia and calls on them to stop the flow of oil to the West	No	No

Date	Event Date¹	Description	Air Travel²	Homeland³
12/27/2004	12/27/2004	In an audio tape, the al-Qaida leader calls on Iraqis to boycott the January 2005 elections and names as his Iraq deputy Abu Musab al-Zarqawi, a Jordanian blamed for major anti-U.S. attacks in Iraq	No	Yes
1/19/2006	1/19/2006	In excerpts of an audio tape aired by Al Jazeera, bin Laden says al-Qaida is making preparations for attacks in the United States and offers a truce on "fair" but undefined conditions		

¹If the event occurred while the U.S. financial markets were closed, the subsequent trading day was used as the event date.

²The Air Travel column indicates whether the attack, threat level, or warning message was directed at air travel.

³The Homeland column indicates whether the attack, threat level, or warning message was directed at the U.S. homeland.

⁴Source: *The World Almanac and Book of Facts, 2007*, Notable Terrorist Incidents

⁵Source: Wikipedia entry for Homeland Security Advisory System, Department of Homeland Security, The White House

⁶Source: Al Jazeera, <http://english.aljazeera.net/English/archive/archive?ArchiveId=18162>

Table A-2: Firms Included In the Study

Air Travel		Defense
Air LA	Mesa Air Group	Alliant Techsystems
Air Wisconsin	Metro Airlines	Armor Holdings
AirTran	Midway Airlines	Ceradyne, Inc
Alaska Air	Midwest Air	Curtiss Wright
America West	Northwest Airlines	Curtiss Wright
American Airlines	Pan Am	Diagnostic Retrieval Systems, Inc
ASA Holdings	Pinnacle Airlines	DRS Technologies
ATA Airlines	Presidential Airways	FLIR Systems, Inc
Braniff	Priceline.com	General Dynamics
CC Air, Inc	Reno Air	Goodrich Corp.
Comair	Republic Airways Holdings	Harris Corp.
Continental Airlines	SkyWest	L-3 Communications
Delta Air	Southwest Airlines	Lockheed Martin
ExpressJet	States West Airlines	Northrop Grumman
Florida West Airlines	Tower Air	Orbital Sciences
FLYi, Inc	TWA	Raytheon
Frontier Airlines	United Airlines	Raytheon
Great Lakes Aviation	USAir	Rockwell Collins
HAL, Inc	Vanguard Airlines	Taser International
Hawaiian Airlines	WestAir Holdings	
JetBlue	Western Pacific Airlines	
Mair Holdings	WorldCorp, Inc	

Note: All traded securities for each company listed were included in the study.

Table A-3: Daily Abnormal Returns by Industry and Event Category

Date (τ)	<i>Airlines</i>						<i>Defense</i>					
	(1) Terrorist Attacks		(2) Threat Elevations		(3) al-Qaida Warnings		(1) Terrorist Attacks		(2) Threat Elevations		(3) al-Qaida Warnings	
	Mean Abnormal Return	CDA t- statistic										
-20	0.16%	0.370	-0.93%	-1.493\$	-0.16%	-0.285	0.18%	0.540	-0.10%	-0.319	-0.01%	-0.019
-19	0.16%	0.368	-0.16%	-0.252	-0.18%	-0.313	-0.31%	-0.914	-0.25%	-0.826	0.06%	0.208
-18	-0.52%	-1.219	-0.73%	-1.173	-0.12%	-0.217	-0.30%	-0.906	-0.63%	-2.072*	0.44%	1.582\$
-17	-0.53%	-1.242	-0.26%	-0.415	0.26%	0.452	-0.08%	-0.250	-0.42%	-1.386\$	0.20%	0.731
-16	0.06%	0.136	0.78%	1.242	0.24%	0.433	0.04%	0.118	0.47%	1.538\$	0.05%	0.188
-15	-0.58%	-1.338\$	-0.99%	-1.580\$	0.00%	0.007	-0.15%	-0.446	0.07%	0.213	0.00%	0.013
-14	0.30%	0.687	-0.41%	-0.652	0.29%	0.508	-1.14%	-3.394#	-0.07%	-0.214	-0.40%	-1.431\$
-13	0.52%	1.213	-0.12%	-0.199	0.27%	0.484	-0.23%	-0.669	-0.23%	-0.760	0.21%	0.745
-12	-0.20%	-0.465	0.22%	0.348	0.28%	0.496	0.68%	2.017*	-0.14%	-0.463	-0.44%	-1.575\$
-11	0.03%	0.078	-0.60%	-0.954	0.53%	0.934	-0.13%	-0.375	-0.37%	-1.220	0.05%	0.167
-10	0.75%	1.751*	0.39%	0.621	-0.02%	-0.028	-0.21%	-0.617	0.26%	0.842	0.18%	0.647
-9	0.01%	0.017	-0.78%	-1.254	-0.43%	-0.759	-0.13%	-0.384	-0.07%	-0.236	-0.01%	-0.052
-8	-0.62%	-1.438\$	-0.44%	-0.705	-0.89%	-1.578\$	-0.43%	-1.290\$	-0.09%	-0.286	0.16%	0.574
-7	-0.49%	-1.140	-0.10%	-0.162	-0.40%	-0.704	0.22%	0.663	0.15%	0.495	-0.15%	-0.529
-6	-0.18%	-0.408	0.83%	1.325\$	-0.33%	-0.588	0.09%	0.281	0.10%	0.338	0.13%	0.464
-5	0.30%	0.692	0.22%	0.354	0.75%	1.326\$	-0.25%	-0.729	-0.40%	-1.306\$	0.09%	0.340
-4	-0.21%	-0.498	-0.95%	-1.519\$	0.43%	0.759	-0.28%	-0.845	0.21%	0.700	-0.18%	-0.645
-3	-0.47%	-1.097	-0.66%	-1.049	0.33%	0.586	-0.65%	-1.921*	0.19%	0.614	-0.70%	-2.520@
-2	-0.28%	-0.662	0.00%	0.002	0.11%	0.190	-0.04%	-0.115	0.13%	0.425	-0.01%	-0.040
-1	0.55%	1.269	-0.41%	-0.662	0.76%	1.337\$	-0.04%	1.042	-0.19%	-0.608	-0.38%	-1.365\$
0	-0.73%	-1.692*	-1.03%	-1.652*	-0.15%	-0.263	0.11%	0.318	0.12%	0.395	-0.45%	-1.620\$
1	-0.24%	-0.557	-0.57%	-0.913	-0.81%	-1.428\$	-0.30%	-0.900	-0.08%	-0.259	-0.11%	-0.378
2	-0.09%	-0.214	0.37%	0.597	-0.24%	-0.416	-0.44%	-1.316\$	0.17%	0.549	-0.53%	-1.893*
3	0.24%	0.566	-0.58%	-0.923	-0.31%	-0.542	-0.05%	-0.143	-0.22%	-0.717	-0.18%	-0.651
4	0.60%	1.407\$	0.70%	1.118	0.13%	0.229	0.08%	0.240	-0.40%	-1.310\$	0.34%	1.202
5	0.87%	2.019*	-0.34%	-0.551	0.02%	0.038	0.58%	1.736*	-0.44%	-1.434\$	0.16%	0.573
6	0.23%	0.539	-0.38%	-0.614	0.10%	0.185	0.36%	1.077	-0.09%	-0.283	-0.21%	-0.762
7	0.75%	1.756*	0.09%	0.139	-0.39%	-0.684	-0.18%	-0.531	-0.13%	-0.425	0.23%	0.837
8	-0.28%	-0.651	0.01%	0.014	0.71%	1.256	0.13%	0.380	-0.08%	-0.277	-0.19%	-0.672
9	0.18%	0.416	-0.47%	-0.749	0.25%	0.448	0.43%	1.285\$	-0.07%	-0.221	-0.01%	-0.018
10	-0.44%	-1.014	0.16%	0.252	-0.11%	-0.190	0.13%	0.377	-0.04%	-0.146	0.26%	0.926
11	-0.25%	-0.588	-0.42%	-0.672	1.86%	3.294#	0.16%	0.485	-0.02%	-0.052	-0.43%	-1.528\$
12	0.15%	0.340	1.10%	1.754*	0.39%	0.695	-0.01%	-0.016	-0.02%	-0.056	-0.19%	-0.688
13	-0.91%	-2.118*	-0.88%	-1.399\$	-0.11%	-0.197	0.02%	0.058	0.03%	0.112	0.49%	1.757*
14	-0.28%	-0.640	0.47%	0.755	0.06%	0.110	-0.19%	-0.565	-0.01%	-0.032	-0.35%	-1.243
15	0.71%	1.660*	0.91%	1.455\$	-0.30%	-0.539	0.22%	0.662	0.42%	1.356\$	-0.24%	-0.848
16	-0.87%	-2.028*	-0.23%	-0.361	-0.38%	-0.668	0.06%	0.185	0.10%	0.323	0.11%	0.382
17	0.54%	1.262	0.19%	0.300	0.26%	0.459	-0.41%	-1.229	0.09%	0.300	-0.29%	-1.045
18	-0.01%	-0.027	-0.88%	-1.403\$	0.73%	1.299\$	0.08%	0.252	-0.21%	-0.699	0.18%	0.658
19	-0.15%	-0.348	-0.19%	-0.308	-0.57%	-1.015	-0.32%	-0.938	-0.06%	-0.210	-0.23%	-0.811
20	-0.42%	-0.987	0.61%	0.978	0.12%	0.215	0.16%	0.461	-0.39%	-1.260	-0.11%	-0.382

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: The table above shows average daily abnormal returns aggregated for:

- (1) Terrorist Attack events
- (2) Department of Homeland Security Threat Elevation events
- (3) al-Qaida Warning events

over the period December 22, 1988 to August 10, 2006

Table A-4: Daily Abnormal Returns for Airline Stocks and Terror Attacks

Date	12/22/1988		2/26/1993		4/19/1995		11/13/1995		6/25/1996		7/18/1996		8/7/1998		11/1/1999		10/12/2000		9/17/2001		11/12/2001		12/24/2001	
(τ)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
-20	0.89%	0.976	-0.95%	-0.700	0.00%	-0.001	1.15%	0.919	0.20%	0.175	0.06%	0.057	-1.49%	-1.340\$	1.08%	0.682	0.47%	0.375	-0.49%	-0.362	0.26%	0.099	-0.33%	-0.118
-19	-0.82%	-0.905	2.81%	2.084*	-0.18%	-0.144	-0.72%	-0.575	0.83%	0.712	-1.11%	-0.992	0.52%	0.469	1.19%	0.749	0.51%	0.412	-0.83%	-0.612	0.01%	0.005	-0.24%	-0.087
-18	-0.11%	-0.120	2.06%	1.524\$	-0.83%	-0.678	-1.09%	-0.873	-1.38%	-1.184	0.45%	0.405	1.20%	1.077	0.35%	0.219	-1.45%	-1.163	-0.70%	-0.521	-2.50%	-0.955	-2.30%	-0.828
-17	-0.46%	-0.502	-0.69%	-0.510	1.72%	1.396\$	-2.33%	-1.863*	-0.67%	-0.577	0.64%	0.576	-1.94%	-1.743*	2.23%	1.410\$	-1.13%	-0.905	-0.27%	-0.198	-4.27%	-1.630\$	0.59%	0.213
-16	-0.37%	-0.404	-0.23%	-0.169	3.61%	2.936@	0.32%	0.252	0.42%	0.358	-1.51%	-1.358\$	-2.13%	-1.914*	0.02%	0.010	-0.70%	-0.565	-0.49%	-0.366	-0.62%	-0.238	2.32%	0.837
-15	-0.02%	-0.022	1.96%	1.451\$	-2.57%	-2.087*	-0.27%	-0.219	0.44%	0.379	-0.58%	-0.520	-1.16%	-1.047	-1.31%	-0.826	-1.21%	-0.970	-0.84%	-0.621	-0.20%	-0.076	-0.45%	-0.162
-14	-0.18%	-0.200	0.35%	0.262	3.55%	2.887@	-0.25%	-0.199	0.02%	0.013	-1.96%	-1.763*	0.22%	0.200	-0.50%	-0.315	-0.35%	-0.281	-1.15%	-0.850	2.49%	0.950	0.57%	0.206
-13	0.77%	0.844	-0.19%	-0.140	2.72%	2.215*	0.06%	0.046	0.48%	0.417	1.57%	1.405\$	-0.31%	-0.281	0.75%	0.475	0.35%	0.285	-0.43%	-0.318	1.10%	0.419	-2.39%	-0.862
-12	-0.71%	-0.778	0.12%	0.086	-0.03%	-0.024	-0.49%	-0.391	-1.14%	-0.984	-0.20%	-0.180	0.25%	0.226	0.06%	0.039	-0.32%	-0.260	-2.47%	-1.826*	0.03%	0.013	0.65%	0.234
-11	-0.02%	-0.024	0.03%	0.019	-2.22%	-1.803*	-0.26%	-0.209	0.46%	0.392	-0.23%	-0.209	-0.80%	-0.720	-0.35%	-0.224	-0.57%	-0.460	0.80%	0.590	0.36%	0.137	5.05%	1.820*
-10	-0.40%	-0.442	-0.15%	-0.110	5.42%	4.406#	0.98%	0.784	0.66%	0.564	-0.44%	-0.396	-1.89%	-1.698*	0.73%	0.459	0.46%	0.370	-0.99%	-0.733	1.11%	0.423	2.11%	0.760
-9	0.30%	0.327	1.07%	0.795	-1.28%	-1.039	0.60%	0.479	0.28%	0.244	0.56%	0.504	-1.32%	-1.190	-0.19%	-0.122	0.74%	0.597	0.45%	0.336	-1.07%	-0.410	0.85%	0.307
-8	-1.10%	-1.208	-1.52%	-1.124	1.35%	1.096	-0.41%	-0.331	-1.43%	-1.232	-1.06%	-0.951	-0.52%	-0.472	-1.90%	-1.199	-2.10%	-1.691*	-0.67%	-0.495	1.35%	0.514	0.82%	0.295
-7	-0.59%	-0.651	-2.05%	-1.520\$	-0.51%	-0.411	1.45%	1.158	-1.09%	-0.938	-0.30%	-0.272	-1.44%	-1.295\$	-0.55%	-0.350	-0.16%	-0.132	-0.43%	-0.319	-1.31%	-0.500	0.74%	0.266
-6	2.19%	2.404@	-1.32%	-0.979	-1.27%	-1.032	0.16%	0.131	-0.29%	-0.254	-2.92%	-2.620@	2.36%	2.126*	0.11%	0.070	0.65%	0.522	-1.88%	-1.391\$	-1.12%	-0.429	-1.07%	-0.385
-5	1.38%	1.520\$	-0.82%	-0.607	4.41%	3.587#	1.79%	1.430\$	-1.76%	-1.514\$	-1.01%	-0.907	-1.38%	-1.244	0.40%	0.255	-0.79%	-0.637	0.52%	0.389	3.47%	1.324\$	-2.53%	-0.913
-4	1.01%	1.106	-0.48%	-0.356	0.59%	0.481	-1.08%	-0.863	-0.01%	-0.005	-0.92%	-0.828	-0.94%	-0.846	0.25%	0.157	1.49%	1.199	-1.21%	-0.899	-2.75%	-1.052	0.39%	0.139
-3	0.18%	0.199	0.26%	0.195	0.80%	0.647	0.66%	0.527	-1.17%	-1.010	-2.41%	-2.165*	-2.08%	-1.876*	0.65%	0.410	-0.85%	-0.682	0.77%	0.572	0.68%	0.260	-1.22%	-0.441
-2	1.37%	1.498\$	-0.23%	-0.167	-1.44%	-1.168	-0.88%	-0.701	0.41%	0.350	-0.90%	-0.810	-0.41%	-0.368	-1.02%	-0.646	1.09%	0.876	-0.46%	-0.339	0.87%	0.333	-1.99%	-0.718
-1	0.24%	0.265	2.61%	1.931*	-0.29%	-0.233	1.66%	1.327\$	0.58%	0.501	-0.90%	-0.807	-0.90%	-0.868	-0.43%	-0.273	-2.01%	-1.611\$	-1.09%	-0.810	0.40%	0.154	2.78%	1.001
0	-0.41%	-0.450	0.91%	0.677	2.16%	1.756*	-0.06%	-0.045	-1.58%	-1.362\$	-1.30%	-1.165	2.23%	2.011*	-0.37%	-0.232	-1.95%	-1.569\$	-33.03%	-24.455#	-5.67%	-2.168*	-2.68%	-0.965
1	-0.15%	-0.159	0.48%	0.353	-1.27%	-1.034	-2.45%	-1.958*	-0.67%	-0.577	-0.82%	-0.738	0.45%	0.406	0.46%	0.288	-1.13%	-0.912	0.37%	0.270	2.38%	0.908	1.17%	0.421
2	-0.86%	-0.940	2.01%	1.489\$	2.36%	1.920*	-1.66%	-1.329\$	-2.01%	-1.729*	-0.69%	-0.620	-2.78%	-2.506@	1.11%	0.701	-0.16%	-0.128	-3.58%	-2.654@	3.62%	1.381\$	0.11%	0.038
3	-0.98%	-1.074	-0.15%	-0.109	-1.75%	-1.426\$	-0.29%	-0.232	1.51%	1.295\$	1.43%	1.284\$	1.39%	1.248	-1.13%	-0.715	-0.51%	-0.413	-10.83%	-8.020#	3.64%	1.392\$	-0.70%	-0.254
4	-0.61%	-0.672	0.42%	0.312	4.45%	3.618#	-0.08%	-0.064	-0.24%	-0.208	-2.28%	-2.049*	-2.06%	-1.856*	0.89%	0.561	-1.80%	-1.444\$	4.90%	3.626#	3.84%	1.467\$	6.18%	2.230*
5	-1.33%	-1.457\$	-0.91%	-0.676	2.46%	2.001*	0.96%	0.772	-0.31%	-0.271	-0.51%	-0.454	-0.11%	-0.097	1.48%	0.933	1.30%	1.044	4.76%	3.526#	6.73%	2.570@	0.31%	0.113
6	1.65%	1.816*	-0.62%	-0.459	2.04%	1.661*	-0.93%	-0.745	-0.52%	-0.444	0.43%	0.387	-0.42%	-0.378	-0.74%	-0.467	-0.19%	-0.156	-1.91%	-1.414\$	-0.96%	-0.366	2.94%	1.058
7	0.41%	0.453	1.37%	1.016	0.63%	0.512	2.31%	1.849*	0.41%	0.354	-0.72%	-0.644	1.64%	1.474\$	-0.78%	-0.493	0.56%	0.449	-0.72%	-0.534	0.40%	0.153	2.72%	0.979
8	0.66%	0.729	0.01%	0.007	0.75%	0.607	0.00%	0.003	-1.16%	-0.993	-0.84%	-0.752	-3.03%	-2.729@	-0.64%	-0.407	0.51%	0.407	-1.58%	-1.173	1.71%	0.655	-0.15%	-0.054
9	0.97%	1.069	0.53%	0.396	-0.83%	-0.672	0.31%	0.247	-0.36%	-0.310	1.00%	0.897	-1.25%	-1.130	0.73%	0.459	0.01%	0.007	4.10%	3.033@	-0.36%	-0.138	1.63%	0.587
10	-0.56%	-0.611	-0.53%	-0.392	2.50%	2.035*	-1.65%	-1.318\$	-2.98%	-2.563@	0.08%	0.069	-2.61%	-2.354@	-0.44%	-0.280	2.70%	2.166*	1.27%	0.941	-0.15%	-0.056	-0.42%	-0.151
11	-0.25%	-0.271	0.59%	0.440	0.13%	0.104	0.07%	0.056	-1.14%	-0.978	0.12%	0.104	-1.04%	-0.940	-0.39%	-0.246	2.20%	1.764*	5.64%	4.173#	-2.32%	-0.887	-0.46%	-0.164
12	-0.07%	-0.077	-1.46%	-1.083	-1.06%	-0.861	0.84%	0.668	-0.99%	-0.850	0.66%	0.589	1.02%	0.920	-0.90%	-0.570	3.61%	2.896@	3.98%	2.948@	0.67%	0.255	-1.35%	-0.488
13	-0.14%	-0.155	1.55%	1.146	-1.45%	-1.178	-0.76%	-0.605	-2.57%	-2.213*	-0.97%	-0.875	-3.17%	-2.858@	-2.29%	-1.451\$	1.43%	1.148	-3.15%	-2.334@	2.22%	0.850	-2.04%	-0.737
14	-0.12%	-0.131	0.44%	0.326	-0.53%	-0.434	-0.91%	-0.731	-0.98%	-0.842	0.59%	0.532	-2.19%	-1.975*	-0.67%	-0.425	0.29%	0.233	-2.65%	-1.963*	-0.48%	-0.183	2.56%	0.922
15	0.15%	0.164	1.15%	0.852	0.33%	0.267	0.39%	0.309	2.22%	1.907*	0.47%	0.419	1.22%	1.097	-1.08%	-0.681	0.85%	0.686	-1.51%	-1.121	0.67%	0.257	1.65%	0.595
16	0.97%	1.070	-1.56%	-1.157	1.35%	1.094	-0.59%	-0.476	-1.31%	-1.129	-0.91%	-0.813	-1.73%	-1.558\$	1.24%	0.782	-2.43%	-1.953*	-1.61%	-1.192	-2.07%	-0.793	-3.43%	-1.237
17	0.93%	1.025	5.20%	3.850#	1.34%	1.090	-0.64%	-0.510	-0.92%	-0.790	-0.80%	-0.717	0.94%	0.846	-1.28%	-0.808	0.86%	0.689	5.44%	4.026#	0.61%	0.234	2.37%	0.854
18	-0.15%	-0.169	0.23%	0.168	-0.52%	-0.421	0.63%	0.502	-0.79%	-0.677	-0.66%	-0.590	-1.89%	-1.701*	0.24%	0.152	-0.89%	-0.712	3.74%	2.771@	4.76%	1.821*	-0.04%	-0.013
19	-0.16%	-0.179	0.02%	0.016	0.36%	0.296	-0.53%	-0.422	1.32%	1.136	-0.60%	-0.539	-5.11%	-4.600#	0.25%	0.161	1.49%	1.195	-4.14%	-3.064@	1.77%	0.678	0.47%	0.170
20	-0.91%	-1.002	1.55%	1.147	-1.67%	-1.358\$	0.62%	0.497	-2.35%	-2.024*	-1.31%	-1.174	-0.64%	-0.572	0.79%	0.501	-1.00%	-0.804	0.13%	0.097	0.85%	0.325	0.94%	0.338

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: This table shows daily abnormal returns (column a) and test statistics (column b) beginning 20 days before and extending 20 days after the event date, which is centered at $\tau = 0$

Table A-5: Daily Abnormal Returns for Airline Stocks and Threat Elevations

Date (τ)	9/10/2002		2/7/2003		3/17/2003		5/20/2003		12/22/2003		5/26/2004		7/8/2004		8/2/2004		7/7/2005		8/10/2006	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
-20	-6.19%	-2.227*	-1.12%	-0.536	-0.39%	-0.185	-2.44%	-1.062	2.54%	1.214	0.24%	0.139	1.75%	1.090	-0.50%	-0.328	-0.24%	-0.157	-3.43%	-2.341@
-19	0.06%	0.023	-0.92%	-0.440	0.45%	0.216	3.29%	1.431\$	0.90%	0.430	-1.10%	-0.638	0.01%	0.008	-0.73%	-0.474	-1.44%	-0.952	-2.17%	-1.479\$
-18	-5.70%	-2.051*	1.51%	0.727	-0.59%	-0.282	1.32%	0.575	0.91%	0.432	-1.41%	-0.818	-3.47%	-2.170*	-1.44%	-0.937	1.62%	1.068	0.44%	0.301
-17	-2.12%	-0.765	0.69%	0.333	0.29%	0.140	1.16%	0.505	-0.64%	-0.307	0.08%	0.049	1.00%	0.624	-2.37%	-1.542\$	-0.90%	-0.595	0.41%	0.282
-16	4.42%	1.591\$	1.08%	0.518	-0.90%	-0.428	1.89%	0.823	1.49%	0.712	-0.81%	-0.471	0.54%	0.339	-0.98%	-0.634	-0.45%	-0.299	1.84%	1.254
-15	-2.45%	-0.882	-0.59%	-0.285	0.30%	0.142	-1.05%	-0.456	-1.46%	-0.696	-0.37%	-0.213	-0.54%	-0.339	-0.31%	-0.203	-1.73%	-1.137	-1.91%	-1.305\$
-14	1.89%	0.681	-0.37%	-0.178	-1.42%	-0.675	3.02%	1.314\$	-2.47%	-1.176	-1.15%	-0.666	-0.06%	-0.035	-2.63%	-1.710*	0.17%	0.115	-1.01%	-0.690
-13	6.22%	2.239*	-1.45%	-0.699	0.31%	0.149	1.88%	0.817	-2.63%	-1.256	-1.52%	-0.881	0.33%	0.209	-2.10%	-1.366\$	-2.80%	-1.844*	0.69%	0.470
-12	3.75%	1.350\$	-4.80%	-2.304*	-1.99%	-0.947	9.13%	3.968#	-3.03%	-1.447\$	-1.07%	-0.621	0.34%	0.214	0.34%	0.221	0.15%	0.098	-0.47%	-0.323
-11	-0.65%	-0.234	1.51%	0.727	-1.66%	-0.792	1.67%	0.724	-3.68%	-1.755*	0.15%	0.088	-0.96%	-0.599	-2.23%	-1.447\$	0.75%	0.491	-0.85%	-0.579
-10	-0.74%	-0.265	0.18%	0.085	4.76%	2.265*	0.95%	0.414	-0.39%	-0.188	-0.25%	-0.146	-0.15%	-0.096	0.02%	0.013	-0.04%	-0.026	-0.55%	-0.375
-9	-0.02%	-0.007	-1.04%	-0.502	-1.79%	-0.853	-3.16%	-1.373\$	-2.12%	-1.013	0.10%	0.060	-0.56%	-0.350	0.90%	0.586	-1.01%	-0.665	0.81%	0.552
-8	-1.09%	-0.393	1.41%	0.675	0.65%	0.309	-0.46%	-0.200	-1.51%	-0.720	-1.20%	-0.698	1.96%	1.224	-1.35%	-0.877	-0.90%	-0.595	-2.32%	-1.582\$
-7	0.66%	0.236	-1.14%	-0.545	0.34%	0.163	0.47%	0.205	2.91%	1.390\$	0.17%	0.100	0.80%	0.499	-1.11%	-0.722	-2.45%	-1.614\$	-1.73%	-1.180
-6	-0.11%	-0.038	-0.46%	-0.219	1.40%	0.665	0.18%	0.078	2.10%	1.000	1.73%	1.005	0.15%	0.095	0.43%	0.281	2.98%	1.963*	-0.17%	-0.119
-5	3.15%	1.134	-2.21%	-1.061	-0.63%	-0.300	0.21%	0.091	-1.29%	-0.618	0.15%	0.089	-0.50%	-0.313	-0.23%	-0.146	0.79%	0.522	3.20%	2.182*
-4	0.75%	0.269	-2.98%	-1.433\$	-4.96%	-2.359@	-0.43%	-0.186	0.44%	0.208	1.29%	0.747	0.04%	0.027	-2.06%	-1.336\$	-0.84%	-0.551	-0.61%	-0.417
-3	-2.91%	-1.047	0.63%	0.304	-1.13%	-0.540	-1.24%	-0.539	-0.81%	-0.389	1.09%	0.634	-0.60%	-0.376	-0.23%	-0.147	0.00%	-0.002	-1.56%	-1.063
-2	0.11%	0.041	2.75%	1.323\$	-1.98%	-0.940	-0.48%	-0.209	-0.18%	-0.086	-0.17%	-0.101	-0.83%	-0.517	2.76%	1.791*	-2.09%	-1.379\$	-0.02%	-0.011
-1	-2.02%	-0.729	1.46%	0.699	2.57%	1.224	-1.28%	-0.556	-1.05%	-0.500	-0.06%	-0.037	-1.54%	-0.962	-1.09%	-0.711	0.94%	0.618	-2.33%	-1.591\$
0	-1.28%	-0.461	-1.15%	-0.550	0.08%	0.038	-1.36%	-0.591	-1.58%	-0.755	0.20%	0.118	-2.47%	-1.544\$	-2.35%	-1.527\$	-0.90%	-0.592	0.83%	0.566
1	0.30%	0.107	-0.19%	-0.093	0.72%	0.342	-1.19%	-0.519	1.72%	0.820	-1.38%	-0.801	-1.08%	-0.672	-1.92%	-1.245	1.02%	0.672	-4.06%	-2.764@
2	0.98%	0.352	0.05%	0.024	0.25%	0.118	2.13%	0.926	-0.86%	-0.411	-1.13%	-0.657	-0.41%	-0.257	1.43%	0.930	0.54%	0.357	0.85%	0.576
3	-2.50%	-0.901	1.11%	0.533	-0.75%	-0.357	2.31%	1.002	0.07%	0.033	-1.48%	-0.861	-2.73%	-1.706*	0.21%	0.135	-1.81%	-1.194	0.17%	0.115
4	-2.28%	-0.822	-5.09%	-2.447@	11.00%	5.238#	0.30%	0.129	-0.99%	-0.473	2.55%	1.479\$	-2.20%	-1.375\$	0.09%	0.056	2.11%	1.391\$	1.75%	1.194
5	0.84%	0.302	-0.44%	-0.210	-2.65%	-1.262	-1.51%	-0.657	-0.18%	-0.085	-1.48%	-0.862	0.24%	0.151	-1.60%	-1.038	3.16%	2.085*	0.10%	0.070
6	-3.33%	-1.197	0.40%	0.194	2.90%	1.380\$	1.14%	0.494	-1.13%	-0.540	0.64%	0.369	-2.33%	-1.452\$	0.18%	0.115	-0.90%	-0.592	-1.28%	-0.870
7	0.86%	0.309	-0.67%	-0.323	-0.57%	-0.273	-1.74%	-0.758	1.49%	0.710	-1.10%	-0.636	-0.08%	-0.049	2.48%	1.614\$	1.33%	0.878	-1.54%	-1.050
8	-2.70%	-0.971	0.21%	0.101	-3.57%	-1.700*	2.92%	1.270	-2.42%	-1.155	1.96%	1.136	0.80%	0.501	0.55%	0.355	1.50%	0.987	0.72%	0.489
9	-3.28%	-1.181	-0.96%	-0.460	-1.55%	-0.736	-0.34%	-0.150	2.58%	1.232	-0.02%	-0.014	-1.45%	-0.904	-1.90%	-1.238	1.70%	1.117	0.98%	0.667
10	-2.37%	-0.854	0.20%	0.098	3.50%	1.665*	3.92%	1.704*	1.19%	0.568	-3.68%	-2.138*	-1.21%	-0.756	2.16%	1.402\$	-0.61%	-0.399	-1.38%	-0.938
11	-2.06%	-0.741	-1.48%	-0.712	2.52%	1.200	2.52%	1.093	-4.50%	-2.147*	1.06%	0.618	0.33%	0.208	-0.24%	-0.153	-1.79%	-1.179	-0.56%	-0.381
12	4.15%	1.493\$	0.22%	0.108	3.65%	1.735*	-0.04%	-0.016	-1.72%	-0.821	0.65%	0.379	-0.32%	-0.202	2.25%	1.460\$	0.18%	0.118	2.05%	1.399\$
13	-2.42%	-0.871	-2.05%	-0.984	1.83%	0.871	-1.48%	-0.642	-1.34%	-0.640	-0.65%	-0.378	-2.16%	-1.346\$	-2.16%	-1.401\$	1.03%	0.677	1.31%	0.891
14	2.66%	0.959	-1.73%	-0.832	2.32%	1.103	-0.07%	-0.031	-0.07%	-0.035	-0.03%	-0.019	-0.32%	-0.203	1.25%	0.814	-0.54%	-0.353	1.55%	1.059
15	-3.06%	-1.101	4.68%	2.247*	5.81%	2.768@	-1.60%	-0.697	-0.18%	-0.086	0.17%	0.100	2.66%	1.660*	1.30%	0.843	-0.49%	-0.325	-0.12%	-0.083
16	2.98%	1.071	-1.88%	-0.903	-4.04%	-1.924*	0.02%	0.010	-1.10%	-0.527	0.39%	0.225	-1.19%	-0.745	1.53%	0.997	1.72%	1.136	-1.30%	-0.885
17	0.69%	0.250	0.59%	0.282	1.69%	0.807	1.22%	0.530	0.13%	0.063	-1.08%	-0.628	-2.45%	-1.529\$	-0.31%	-0.205	0.74%	0.490	1.15%	0.785
18	-0.22%	-0.080	0.26%	0.124	-2.72%	-1.295\$	-0.25%	-0.108	-0.17%	-0.079	-0.04%	-0.022	-2.01%	-1.258	0.48%	0.313	-2.23%	-1.469\$	-2.22%	-1.510\$
19	-1.21%	-0.435	1.33%	0.640	-1.22%	-0.582	1.73%	0.754	1.54%	0.734	-0.65%	-0.376	1.33%	0.832	-3.27%	-2.122*	-1.12%	-0.737	-0.26%	-0.175
20	-2.40%	-0.863	-0.73%	-0.351	0.53%	0.255	4.00%	1.740*	3.61%	1.723*	2.15%	1.250	0.11%	0.069	0.93%	0.606	-0.84%	-0.556	-1.21%	-0.822

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: This table shows daily abnormal returns (column a) and test statistics (column b) beginning 20 days before and extending 20 days after the event date, which is centered at $\tau = 0$

Table A-6: Daily Abnormal Returns for Airline Stocks and al-Qaida Messages

Date (τ)	12/13/2001		10/7/2002		2/12/2003		4/7/2003		9/10/2003		1/5/2004		4/15/2004		5/6/2004		10/29/2004		12/16/2004		12/27/2004		1/19/2006	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
-20	3.71%	1.357\$	-2.00%	-0.694	0.71%	0.344	-0.64%	-0.316	-1.20%	-0.502	-2.94%	-1.421\$	0.81%	0.405	0.51%	0.279	0.52%	0.348	-1.31%	-0.813	-0.32%	-0.197	0.09%	0.068
-19	3.87%	1.416\$	-1.26%	-0.438	1.09%	0.525	-5.16%	-2.541@	1.86%	0.773	-3.52%	-1.700*	-1.07%	-0.535	-0.89%	-0.484	1.78%	1.183	0.36%	0.221	1.32%	0.821	-0.72%	-0.554
-18	4.47%	1.635\$	0.30%	0.103	-0.58%	-0.277	-0.82%	-0.402	0.48%	0.201	-0.49%	-0.234	0.72%	0.358	-2.53%	-1.374\$	-2.74%	-1.817*	-1.27%	-0.789	0.89%	0.552	0.32%	0.247
-17	6.12%	2.239*	0.92%	0.320	-0.36%	-0.172	-1.62%	-0.797	-0.65%	-0.273	-1.92%	-0.925	-1.32%	-0.660	-0.05%	-0.028	0.67%	0.448	-0.99%	-0.611	1.44%	0.893	0.67%	0.519
-16	-0.47%	-0.172	-2.50%	-0.865	-1.44%	-0.695	2.92%	1.439\$	0.57%	0.237	-1.49%	-0.717	0.77%	0.384	1.10%	0.598	-1.85%	-1.228	1.56%	0.968	2.95%	1.835*	1.23%	0.945
-15	0.12%	0.043	-2.28%	-0.791	-4.78%	-2.303*	0.32%	0.157	1.42%	0.591	2.79%	1.347\$	-0.43%	-0.214	-1.31%	-0.709	1.06%	0.706	1.21%	0.751	0.01%	0.007	2.37%	1.827*
-14	2.15%	0.785	0.80%	0.276	1.54%	0.741	0.93%	0.459	0.39%	0.164	2.17%	1.048	1.55%	0.775	-1.77%	-0.963	-0.85%	-0.563	-0.31%	-0.193	-2.35%	-1.459\$	-0.88%	-0.678
-13	-0.23%	-0.085	-3.34%	-1.156	0.18%	0.088	0.35%	0.172	1.63%	0.679	-1.24%	-0.600	2.51%	1.253	-1.51%	-0.820	1.57%	1.041	1.32%	0.821	1.03%	0.640	1.15%	0.889
-12	-0.21%	-0.075	0.79%	0.275	-1.03%	-0.497	-0.50%	-0.248	-0.05%	-0.023	0.40%	0.194	-0.49%	-0.243	2.13%	1.155	2.43%	1.617\$	0.89%	0.553	-1.07%	-0.663	-0.17%	-0.128
-11	-2.31%	-0.845	-2.69%	-0.933	1.43%	0.689	11.45%	5.644#	-1.63%	-0.681	-0.82%	-0.396	-1.89%	-0.944	2.42%	1.313\$	3.83%	2.543@	1.45%	0.897	-1.63%	-1.014	-3.62%	-2.790@
-10	0.71%	0.258	-3.31%	-1.147	-1.11%	-0.536	-2.95%	-1.453\$	0.78%	0.325	-0.12%	-0.057	2.15%	1.076	0.15%	0.080	-2.25%	-1.494\$	2.96%	1.831*	1.21%	0.751	1.72%	1.324\$
-9	2.39%	0.873	-2.41%	-0.835	-0.45%	-0.215	3.05%	1.501\$	0.00%	0.000	-0.91%	-0.437	-0.01%	-0.006	-2.10%	-1.140	-2.51%	-1.666*	0.02%	0.010	-1.85%	-1.153	0.21%	0.160
-8	-0.42%	-0.153	-2.00%	-0.695	-2.18%	-1.052	-0.57%	-0.280	0.63%	0.261	-1.65%	-0.799	1.43%	0.716	-0.34%	-0.184	-2.30%	-1.526\$	-2.34%	-1.450\$	0.14%	0.085	-0.91%	-0.704
-7	0.70%	0.255	4.19%	1.451\$	-2.96%	-1.426\$	-3.76%	-1.855*	0.49%	0.205	1.80%	0.871	-0.74%	-0.368	-0.53%	-0.288	-3.87%	-2.569@	1.03%	0.638	-0.50%	-0.314	-0.80%	-0.618
-6	-2.23%	-0.815	-2.49%	-0.863	0.65%	0.311	-1.73%	-0.852	1.21%	0.506	-0.81%	-0.390	0.69%	0.347	0.19%	0.105	2.46%	1.633\$	-1.06%	-0.656	-0.29%	-0.178	-0.88%	-0.680
-5	0.70%	0.257	2.63%	0.912	2.77%	1.334\$	3.63%	1.787*	2.87%	1.197	0.04%	0.019	0.53%	0.265	-1.15%	-0.625	1.64%	1.088	-1.62%	-1.006	0.53%	0.328	-3.92%	-3.017@
-4	5.08%	1.860*	-2.25%	-1.030	1.47%	0.708	3.11%	1.534\$	-0.45%	-0.188	-1.00%	-0.481	-0.90%	-0.449	-1.46%	-0.794	2.81%	1.867*	1.21%	0.751	-0.95%	-0.591	-0.91%	-0.699
-3	2.10%	0.770	2.92%	1.014	-1.13%	-0.545	4.30%	2.118*	1.81%	0.753	-0.16%	-0.076	-2.56%	-1.280	0.02%	0.012	-1.01%	-0.669	-1.84%	-1.143	0.66%	0.408	-0.76%	-0.587
-2	0.91%	0.332	0.67%	0.232	-0.17%	-0.083	1.86%	0.918	0.11%	0.047	-1.05%	-0.506	-0.01%	-0.005	-0.87%	-0.472	2.01%	1.336\$	0.14%	0.089	1.96%	1.220	-4.96%	-3.820#
-1	0.89%	0.324	-0.27%	-0.094	0.07%	0.031	2.35%	1.157	-1.17%	-0.489	1.35%	0.650	1.10%	0.549	-0.43%	-0.231	3.18%	2.111*	-0.50%	-0.309	-0.59%	-0.370	3.46%	2.661@
0	0.74%	0.269	-1.25%	-0.433	1.12%	0.541	5.84%	2.880@	-0.28%	-0.116	-2.18%	-1.050	-1.32%	-0.658	-1.20%	-0.651	-3.34%	-2.221*	-0.28%	-0.174	1.66%	1.033	-0.62%	-0.479
1	-0.99%	-0.361	-2.36%	-0.818	-5.08%	-2.444@	-4.01%	-1.977*	1.47%	0.613	2.43%	1.173	-1.80%	-0.901	-1.57%	-0.850	2.19%	1.455\$	0.53%	0.329	-0.24%	-0.152	-0.59%	-0.452
2	-2.42%	-0.886	-5.15%	-1.784*	-0.41%	-0.196	1.73%	0.853	1.16%	0.482	1.02%	0.491	-1.52%	-0.762	-1.12%	-0.607	3.89%	2.586@	-0.95%	-0.586	0.22%	0.140	0.95%	0.733
3	0.49%	0.178	-2.29%	-0.795	0.43%	0.208	-2.69%	-1.327\$	1.59%	0.661	-4.61%	-2.226*	2.17%	1.088	0.09%	0.048	-2.97%	-1.970*	0.67%	0.412	0.77%	0.480	3.19%	2.457@
4	-1.13%	-0.413	0.92%	0.319	-0.66%	-0.316	-1.19%	-0.587	-0.52%	-0.215	-1.51%	-0.728	2.39%	1.196	-0.31%	-0.168	1.24%	0.826	1.97%	1.219	-0.44%	-0.274	0.56%	0.430
5	-1.96%	-0.716	-0.66%	-0.230	0.23%	0.108	0.56%	0.274	1.03%	0.428	-1.36%	-0.657	0.09%	0.043	0.05%	0.025	0.97%	0.642	-0.59%	-0.365	3.25%	2.021*	-1.45%	-1.116
6	2.86%	1.047	4.57%	1.584\$	-0.93%	-0.448	2.42%	1.191	-1.33%	-0.553	-0.03%	-0.013	-2.11%	-1.056	-1.26%	-0.683	0.50%	0.330	1.66%	1.031	-3.07%	-1.910*	-2.22%	-1.706*
7	-2.61%	-0.955	-1.84%	-0.638	0.22%	0.104	2.52%	1.241	-0.97%	-0.406	0.12%	0.058	-0.33%	-0.166	0.12%	0.067	1.31%	0.872	-0.24%	-0.146	-3.74%	-2.324*	1.32%	1.015
8	1.25%	0.459	4.87%	1.688*	-1.46%	-0.703	7.33%	3.615#	0.32%	0.133	-0.97%	-0.467	-0.55%	-0.274	1.67%	0.906	-3.59%	-2.387@	0.23%	0.143	-1.75%	-1.090	1.61%	1.236
9	0.20%	0.074	0.41%	0.143	0.24%	0.115	-0.12%	-0.060	1.28%	0.532	0.09%	0.044	0.23%	0.118	0.10%	0.054	1.46%	0.971	0.78%	0.482	-0.04%	-0.026	-1.88%	-1.448\$
10	-0.62%	-0.227	4.43%	1.536\$	-2.02%	-0.975	-2.18%	-1.073	0.36%	0.150	-0.17%	-0.082	-1.13%	-0.566	1.23%	0.668	-1.67%	-1.108	-0.43%	-0.270	-1.76%	-1.097	3.08%	2.372@
11	6.20%	2.269*	4.05%	1.402\$	-1.71%	-0.824	3.46%	1.707*	-2.22%	-0.925	1.64%	0.791	-1.45%	-0.725	1.03%	0.561	5.52%	3.668#	3.25%	2.015*	2.08%	1.295\$	0.10%	0.077
12	0.41%	0.149	3.78%	1.310\$	4.69%	2.260*	1.37%	0.677	-3.15%	-1.311\$	3.50%	1.689*	-0.02%	-0.011	-0.23%	-0.125	0.11%	0.074	-3.07%	-1.903*	-1.71%	-1.063	-1.37%	-1.052
13	3.04%	1.114	2.42%	0.838	-1.87%	-0.900	1.17%	0.577	-1.01%	-0.420	0.68%	0.328	-0.88%	-0.443	-0.13%	-0.072	-1.24%	-0.825	-3.73%	-2.313*	-0.16%	-0.097	0.48%	0.371
14	2.81%	1.028	-0.87%	-0.303	0.61%	0.294	2.13%	1.051	0.44%	0.182	-3.29%	-1.589\$	-0.44%	-0.220	0.43%	0.287	-1.75%	-1.082	-0.21%	-0.129	1.00%	0.770		
15	-0.11%	-0.040	-0.17%	-0.059	0.27%	0.132	-0.92%	-0.451	-1.37%	-0.572	2.02%	0.973	-1.18%	-0.592	-1.44%	-0.782	-1.18%	-0.782	-0.04%	-0.023	-0.09%	-0.054	0.60%	0.458
16	1.68%	0.615	-1.03%	-0.359	1.36%	0.653	3.13%	1.541\$	0.62%	0.259	-2.50%	-1.208	-1.52%	-0.762	-1.19%	-0.645	-0.92%	-0.609	-1.76%	-1.089	-1.20%	-0.744	-1.08%	-0.830
17	-0.37%	-0.136	0.25%	0.087	-0.72%	-0.349	1.98%	0.978	1.55%	0.644	-0.04%	-0.020	-1.09%	-0.544	-1.54%	-0.836	1.64%	1.090	2.09%	1.292\$	-0.43%	-0.265	-0.10%	-0.079
18	-0.38%	-0.140	1.78%	0.619	-5.02%	-2.418@	9.35%	4.607#	2.49%	1.037	-2.68%	-1.293\$	0.05%	0.026	2.49%	1.352\$	1.28%	0.853	-1.70%	-1.054	-1.04%	-0.645	3.05%	2.349@
19	-1.33%	-0.486	0.55%	0.191	-1.18%	-0.569	1.75%	0.861	0.14%	0.059	-3.10%	-1.495\$	-0.32%	-0.162	-1.54%	-0.833	-0.23%	-0.155	-0.15%	-0.096	-2.34%	-1.458\$	1.31%	1.008
20	-2.01%	-0.734	3.73%	1.294\$	-1.97%	-0.951	1.12%	0.553	0.03%	0.012	-2.41%	-1.164	0.04%	0.020	0.57%	0.312	1.41%	0.936	-0.20%	-0.123	2.60%	1.614\$	-1.68%	-1.296\$

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: This table shows daily abnormal returns (column a) and test statistics (column b) beginning 20 days before and extending 20 days after the event date, which is centered at $\tau = 0$

Table A-7: Daily Abnormal Returns for Defense Stocks and Terror Attacks

Date	12/22/1988		2/26/1993		4/19/1995		11/13/1995		6/25/1996		7/18/1996		8/7/1998		11/1/1999		10/12/2000		9/17/2001		11/12/2001		12/24/2001	
(τ)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
-20	-0.71%	-0.705	-1.45%	-1.404\$	-0.05%	-0.056	0.47%	0.606	1.04%	1.538\$	-0.89%	-1.307\$	-0.40%	-0.556	0.41%	0.408	1.28%	0.945	-0.43%	-0.420	1.76%	1.223	-0.16%	-0.107
-19	-0.73%	-0.721	0.08%	0.078	-0.58%	-0.661	0.57%	0.739	0.92%	1.359\$	-1.03%	-1.509\$	-0.38%	-0.525	-1.07%	-1.075	-0.82%	-0.606	-0.51%	-0.493	0.11%	0.080	-0.40%	-0.267
-18	-0.15%	-0.149	-0.16%	-0.151	0.17%	0.191	-0.50%	-0.644	0.69%	1.021	-0.14%	-0.207	-0.51%	-0.699	-0.67%	-0.669	0.27%	0.202	-0.59%	-0.575	-2.53%	-1.762*	0.48%	0.325
-17	-0.85%	-0.841	1.29%	1.250	-0.22%	-0.252	-0.52%	-0.667	0.91%	1.342\$	0.02%	0.032	0.39%	0.535	0.31%	0.315	-1.28%	-0.944	0.60%	0.586	-0.76%	-0.526	-0.09%	-0.058
-16	0.47%	0.461	-0.93%	-0.896	-0.66%	-0.749	1.33%	1.714*	-1.04%	-1.533\$	0.41%	0.598	-0.65%	-0.900	-1.15%	-1.156	-0.10%	-0.075	-0.06%	-0.057	1.86%	1.297\$	0.63%	0.424
-15	-0.17%	-0.170	0.78%	0.751	0.62%	0.706	-0.38%	-0.483	0.61%	0.903	-0.42%	-0.624	-1.06%	-1.456\$	0.05%	0.049	0.65%	0.476	-0.34%	-0.333	-1.74%	-1.210	-0.16%	-0.110
-14	-0.50%	-0.492	-0.80%	-0.770	0.51%	0.583	-0.52%	-0.672	1.09%	1.605\$	-1.82%	-2.681@	0.15%	0.208	-8.23%	-8.272#	0.19%	0.139	0.31%	0.305	-2.25%	-1.567\$	0.29%	0.198
-13	0.66%	0.657	-0.89%	-0.863	1.02%	1.168	-1.81%	-2.324*	-1.00%	-1.481\$	1.02%	1.497\$	-0.08%	-0.113	-2.16%	-2.173*	0.29%	0.217	-1.04%	-1.007	0.90%	0.629	-0.32%	-0.215
-12	-0.31%	-0.303	2.26%	2.187*	2.72%	3.112#	0.27%	0.346	0.11%	0.165	-0.43%	-0.626	-0.53%	-0.726	1.07%	1.076	0.89%	0.656	0.78%	0.760	2.08%	1.445\$	-0.61%	-0.414
-11	-0.58%	-0.571	-0.83%	-0.803	-0.30%	-0.346	-1.08%	-1.394\$	-0.34%	-0.501	2.17%	3.187#	-1.52%	-2.101*	-0.35%	-0.349	0.67%	0.496	-0.21%	-0.207	0.86%	0.598	-0.30%	-0.200
-10	-0.98%	-0.971	-0.19%	-0.187	-2.91%	-3.330#	-0.32%	-0.410	0.10%	0.146	0.72%	1.053	-0.52%	-0.719	0.99%	0.994	0.96%	0.707	0.88%	0.859	0.15%	0.105	-0.70%	-0.472
-9	-0.69%	-0.687	0.09%	0.084	-0.07%	-0.074	0.73%	0.943	-0.02%	-0.023	-1.11%	-1.638\$	-1.75%	-2.418@	-1.57%	-1.583\$	3.47%	2.555@	-0.27%	-0.264	-1.21%	-0.839	0.55%	0.372
-8	-0.34%	-0.339	-1.08%	-1.044	1.19%	1.362\$	-0.82%	-1.055	0.38%	0.556	-1.06%	-1.553\$	-1.12%	-1.550\$	-1.15%	-1.154	-2.79%	-2.050*	0.37%	0.358	1.25%	0.870	0.60%	0.408
-7	-0.39%	-0.381	-0.47%	-0.450	0.49%	0.562	-0.18%	-0.238	0.57%	0.837	0.28%	0.414	-0.47%	-0.654	0.33%	0.333	2.16%	1.591\$	-0.78%	-0.758	-0.29%	-0.204	0.16%	0.110
-6	-0.17%	-0.164	-2.24%	-2.167*	0.06%	0.063	1.10%	1.420\$	-0.22%	-0.328	-1.30%	-1.915*	0.27%	0.369	0.14%	0.143	0.13%	0.096	0.33%	0.317	1.99%	1.384\$	0.46%	0.310
-5	0.67%	0.659	0.28%	0.268	0.75%	0.859	0.18%	0.227	-0.95%	-1.404\$	-1.58%	-2.321*	0.29%	0.405	-0.57%	-0.568	-0.93%	-0.682	0.72%	0.696	0.13%	0.093	-0.63%	-0.423
-4	-0.97%	-0.965	-0.34%	-0.326	-0.42%	-0.478	-0.44%	-0.563	-0.44%	-1.272	-0.62%	-0.908	-0.69%	-0.948	1.84%	1.854*	-0.92%	-0.675	-0.95%	-0.923	-0.49%	-0.341	0.30%	0.204
-3	-1.58%	-1.560\$	-0.03%	-0.028	-0.47%	-0.542	-0.17%	-0.223	-1.00%	-1.476\$	-0.93%	-1.367\$	-0.57%	-0.788	-0.31%	-0.311	0.22%	0.164	-0.93%	-0.898	-1.03%	-0.718	-1.31%	-0.887
-2	0.14%	0.135	0.60%	0.581	1.91%	2.184*	-0.13%	-0.171	-0.11%	-0.169	-1.29%	-1.899*	-0.69%	-0.951	0.20%	0.199	0.72%	0.531	-0.67%	-0.651	-0.80%	-0.555	-0.59%	-0.397
-1	-0.02%	-0.023	1.58%	1.529\$	-1.27%	-1.451\$	-0.16%	-0.210	0.05%	0.074	2.52%	3.702#	-0.42%	-0.577	-1.64%	-1.649*	1.16%	0.856	-1.29%	-1.249	1.51%	1.052	0.53%	0.360
0	-0.53%	-0.528	0.38%	0.371	-0.32%	-0.361	-0.36%	-0.462	0.44%	0.644	0.57%	0.845	1.47%	2.023*	-1.71%	-1.717*	0.80%	0.588	15.55%	15.087#	-0.61%	-0.422	0.82%	0.555
1	1.67%	1.655*	0.16%	0.156	-1.47%	-1.684*	-0.01%	-0.012	-0.39%	-0.584	-0.31%	-0.456	-0.98%	-1.354\$	1.56%	1.569\$	1.52%	1.121	-1.52%	-1.473\$	-4.08%	-2.839@	-0.15%	-0.101
2	-0.20%	-0.202	1.18%	1.140	-0.22%	-0.247	-0.80%	-1.036	-1.80%	-2.657@	-0.21%	-0.315	-1.00%	-1.378\$	-1.05%	-1.052	-0.77%	-0.570	-2.37%	-2.300*	-0.75%	-0.522	0.84%	0.567
3	-0.19%	-0.186	-0.91%	-0.877	0.29%	0.332	0.69%	0.885	1.05%	1.547\$	-1.70%	-2.503@	1.35%	1.866*	-0.72%	-0.724	-1.66%	-1.221	0.09%	0.083	-0.17%	-0.120	1.14%	0.771
4	0.52%	0.515	-0.25%	-0.241	0.45%	0.514	0.15%	0.197	-0.40%	-0.590	-1.11%	-1.634\$	-1.01%	-1.392\$	-0.23%	-0.232	-0.29%	-0.217	1.09%	1.058	1.55%	1.080	1.18%	0.797
5	1.50%	1.481\$	1.42%	1.372\$	0.78%	0.889	-0.68%	-0.878	2.20%	3.249#	0.46%	0.677	0.48%	0.662	-0.23%	-0.229	0.79%	0.584	-0.19%	-0.187	1.91%	1.329\$	-1.48%	-1.001
6	0.81%	0.800	-0.92%	-0.892	-0.39%	-0.446	0.24%	0.311	0.75%	1.102	0.01%	0.021	-0.68%	-0.931	0.70%	0.707	0.79%	0.584	-1.03%	-1.000	0.74%	0.518	1.53%	1.030
7	0.53%	0.528	-0.30%	-0.287	-0.16%	-0.184	-0.79%	-1.016	-1.08%	-1.598\$	-0.09%	-0.131	0.30%	0.416	-0.03%	-0.030	1.50%	1.104	-0.33%	-0.321	-0.93%	-0.647	-0.77%	-0.520
8	0.04%	0.042	0.48%	0.462	0.20%	0.226	0.46%	0.587	-1.03%	-1.518\$	0.12%	0.182	0.34%	0.468	0.66%	0.662	-0.10%	-0.073	1.25%	1.209	0.18%	0.127	0.01%	0.004
9	0.12%	0.120	0.97%	0.934	-0.47%	-0.538	-0.51%	-0.661	0.31%	0.458	0.60%	0.887	0.76%	1.055	1.07%	1.074	1.34%	0.985	0.28%	0.269	-0.26%	-0.182	0.62%	0.418
10	0.16%	0.161	-0.82%	-0.795	-0.04%	-0.041	1.08%	1.392\$	-1.27%	-1.885*	-0.34%	-0.504	-1.18%	-1.629\$	2.18%	2.190*	0.70%	0.515	-0.26%	-0.256	-0.49%	-0.340	1.02%	0.690
11	-0.06%	-0.061	0.37%	0.357	-0.14%	-0.158	1.12%	1.447\$	-1.55%	-2.288*	1.21%	1.775*	-0.45%	-0.618	0.16%	0.159	-0.09%	-0.063	1.29%	1.255	0.77%	0.536	0.35%	0.235
12	-0.73%	-0.720	-0.73%	-0.707	0.31%	0.357	0.86%	1.109	-0.59%	-0.871	0.29%	0.427	-0.01%	-0.017	1.67%	1.676*	0.07%	0.055	2.57%	2.498@	-0.02%	-0.015	-1.28%	-0.865
13	-0.28%	-0.277	0.10%	0.092	1.90%	2.169*	-0.91%	-1.175	-0.90%	-1.325\$	0.85%	1.247	-2.22%	-3.062@	0.81%	0.816	1.21%	0.887	-0.50%	-0.489	0.76%	0.529	-0.98%	-0.662
14	0.91%	0.904	0.77%	0.746	-0.27%	-0.314	-0.48%	-0.616	-1.26%	-1.868*	1.01%	0.148	-2.70%	-3.728#	1.68%	1.690*	-0.66%	-0.489	0.44%	0.430	-0.12%	-0.082	0.28%	0.190
15	0.07%	0.066	-1.43%	-1.384\$	0.12%	0.134	-0.16%	-0.210	2.54%	3.764#	0.97%	1.429\$	0.68%	0.937	-0.40%	-0.403	0.39%	0.285	2.79%	2.708@	0.18%	0.128	-0.45%	-0.304
16	1.92%	1.901*	-0.23%	-0.219	-0.45%	-0.519	-0.86%	-1.103	0.60%	0.887	-0.78%	-1.143	0.04%	0.061	0.79%	0.792	-0.92%	-0.679	-0.43%	-0.414	-0.43%	-0.298	1.21%	0.816
17	-1.81%	-1.796*	0.23%	0.220	-0.50%	-0.566	0.15%	0.194	-0.28%	-0.414	-0.30%	-0.437	-1.22%	-1.677*	-1.39%	-1.394\$	0.45%	0.333	-1.78%	-1.728*	-0.65%	-0.455	0.42%	0.287
18	0.23%	0.232	1.11%	1.073	0.86%	0.983	0.15%	0.190	-0.18%	-0.272	0.04%	0.065	0.83%	1.148	-0.09%	-0.090	-2.04%	-1.500\$	-2.15%	-2.082*	-0.32%	-0.225	0.62%	0.419
19	-0.24%	-0.242	0.87%	0.839	0.66%	0.757	-1.89%	-2.431@	-1.67%	-2.473@	-0.07%	-0.104	-0.62%	-0.856	-0.72%	-0.728	0.28%	0.206	-0.46%	-0.445	-0.77%	-0.533	0.64%	0.430
20	-1.23%	-1.220	-0.91%	-0.882	0.50%	0.577	0.05%	0.065	-1.08%	-1.602\$	-0.09%	-0.138	-1.10%	-1.512\$	0.11%	0.106	0.35%	0.254	1.83%	1.773*	0.40%	0.275	3.43%	2.316*

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: This table shows daily abnormal returns (column a) and test statistics (column b) beginning 20 days before and extending 20 days after the event date, which is centered at $\tau = 0$

Table A-8: Daily Abnormal Returns for Defense Stocks and Threat Elevations

Date (τ)	9/10/2002		2/7/2003		3/17/2003		5/20/2003		12/22/2003		5/26/2004		7/8/2004		8/2/2004		7/7/2005		8/10/2006	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
-20	-0.54%	-0.363	-0.52%	-0.438	-1.45%	-1.224	1.67%	1.429\$	0.31%	0.366	-0.23%	-0.294	0.58%	0.763	-0.22%	-0.280	-0.57%	-0.717	-0.05%	-0.087
-19	-2.75%	-1.836*	1.16%	0.970	-1.77%	-1.501\$	0.34%	0.287	0.61%	0.715	0.28%	0.366	-0.13%	-0.170	0.01%	0.018	0.24%	0.307	-0.51%	-0.819
-18	-1.60%	-1.071	-1.70%	-1.426\$	0.22%	0.189	-0.33%	-0.278	0.19%	0.219	-1.81%	-2.357@	-0.56%	-0.741	-0.61%	-0.795	0.77%	0.979	-0.84%	-1.357\$
-17	-1.61%	-1.078	-0.45%	-0.374	-0.65%	-0.552	-0.12%	-0.104	0.05%	0.064	-1.13%	-1.468\$	-0.41%	-0.535	0.50%	0.653	0.06%	0.070	-0.46%	-0.748
-16	0.71%	0.475	1.31%	1.102	0.03%	0.021	1.30%	1.112	0.22%	0.257	0.23%	0.298	0.51%	0.673	0.60%	0.777	-0.20%	-0.254	-0.08%	-0.128
-15	-0.03%	-0.019	0.10%	0.082	-1.06%	-0.898	0.90%	0.766	0.76%	0.888	-0.05%	-0.070	0.34%	0.452	-0.30%	-0.388	0.13%	0.169	-0.15%	-0.244
-14	-0.81%	-0.542	-0.41%	-0.343	0.09%	0.078	1.91%	1.630\$	0.15%	0.171	-0.73%	-0.954	-0.57%	-0.741	0.06%	0.076	-0.47%	-0.592	0.11%	0.174
-13	0.42%	0.278	-0.48%	-0.406	-0.15%	-0.131	-0.62%	-0.533	-0.99%	-1.151	-0.29%	-0.376	1.12%	1.471\$	-1.15%	-1.490\$	-0.47%	-0.590	0.31%	0.497
-12	-0.89%	-0.597	-2.01%	-1.685*	-0.19%	-0.160	0.77%	0.656	1.69%	1.971*	-1.72%	-2.244*	0.64%	0.834	-0.12%	-0.155	-0.38%	-0.477	0.84%	1.360\$
-11	-1.27%	-0.846	-0.96%	-0.809	-0.47%	-0.397	0.08%	0.064	-0.31%	-0.364	0.40%	0.524	-0.11%	-0.144	0.35%	0.447	0.20%	0.256	-1.68%	-2.708@
-10	-1.08%	-0.722	0.98%	0.818	-0.18%	-0.151	0.13%	0.108	1.25%	1.454\$	0.47%	0.614	1.08%	1.422\$	-0.81%	-1.050	0.24%	0.303	0.52%	0.839
-9	-0.26%	-0.174	-0.96%	-0.804	0.94%	0.798	0.63%	0.539	0.33%	0.382	0.55%	0.713	0.55%	0.719	-1.44%	-1.860*	-0.27%	-0.341	-0.85%	-1.370\$
-8	0.00%	0.002	1.48%	1.243	-1.74%	-1.476\$	-0.45%	-0.388	-1.08%	-1.262	-0.08%	-0.103	1.72%	2.262*	-0.02%	-0.023	-0.61%	-0.766	-0.14%	-0.225
-7	0.78%	0.520	-0.60%	-0.505	0.51%	0.436	1.65%	1.405\$	1.99%	2.322*	-0.85%	-1.105	-0.51%	-0.664	-0.77%	-0.997	-0.19%	-0.245	-0.56%	-0.900
-6	0.05%	0.031	-0.37%	-0.314	-0.70%	-0.590	0.60%	0.510	-0.21%	-0.242	-0.30%	-0.390	0.33%	0.437	-0.10%	-0.126	1.66%	2.096*	0.17%	0.278
-5	-1.36%	-0.910	0.81%	0.682	-1.15%	-0.975	0.67%	0.574	-1.78%	-2.078*	0.60%	0.788	0.55%	0.723	-1.67%	-2.164*	0.75%	0.944	-1.41%	-2.280*
-4	1.55%	1.038	-1.71%	-1.435\$	-0.53%	-0.451	0.63%	0.536	0.13%	0.151	-0.51%	-0.665	1.57%	2.059*	0.87%	1.123	0.47%	0.599	-0.34%	-0.549
-3	0.74%	0.496	1.47%	1.233	-0.54%	-0.460	0.28%	0.237	0.49%	0.574	-0.24%	-0.308	-0.20%	-0.263	-0.01%	-0.009	0.28%	0.357	-0.43%	-0.694
-2	1.39%	0.927	-0.56%	-0.472	0.98%	0.832	-0.75%	-0.639	0.66%	0.775	0.06%	0.081	0.03%	0.041	0.47%	0.609	-0.45%	-0.574	-0.61%	-0.981
-1	0.62%	0.413	-0.59%	-0.492	1.48%	1.254	-0.97%	-0.824	-0.70%	-0.815	0.30%	0.387	-0.60%	-0.786	-0.05%	-0.064	-0.33%	-0.413	-1.09%	-1.759*
0	-1.21%	-0.806	0.05%	0.041	1.56%	1.318\$	-0.97%	-0.828	-0.62%	-0.728	0.18%	0.241	0.52%	0.683	0.77%	0.995	0.22%	0.277	0.76%	1.218
1	-0.40%	-0.265	0.15%	0.126	0.51%	0.430	0.44%	0.378	-0.06%	-0.074	-0.38%	-0.489	0.61%	0.805	-1.25%	-1.619\$	-0.28%	-0.349	-0.16%	-0.265
2	0.80%	0.534	0.54%	0.451	0.67%	0.571	-0.14%	-0.119	0.54%	0.625	-0.05%	-0.062	-0.29%	-0.374	-0.22%	-0.289	-0.47%	-0.597	0.27%	0.437
3	-0.75%	-0.503	-0.33%	-0.274	-1.43%	-1.214	0.43%	0.368	0.05%	0.053	0.25%	0.328	0.07%	0.095	-0.44%	-0.572	-0.32%	-0.401	0.30%	0.485
4	0.72%	0.479	-0.52%	-0.436	-2.56%	-2.172*	0.05%	0.041	0.65%	0.762	-0.34%	-0.447	-1.13%	-1.487\$	-1.44%	-1.860*	-0.35%	-0.443	1.01%	1.621\$
5	-2.76%	-1.847*	-1.53%	-1.280	1.86%	1.574\$	0.08%	0.064	-0.93%	-1.081	-0.45%	-0.586	-0.10%	-0.136	-0.68%	-0.883	-0.24%	-0.306	0.43%	0.699
6	0.35%	0.232	-1.85%	-1.552\$	-0.53%	-0.445	1.21%	1.028	-1.11%	-1.292\$	0.46%	0.601	0.36%	0.474	0.42%	0.541	0.00%	0.005	-0.18%	-0.291
7	0.49%	0.328	0.17%	0.144	-0.22%	-0.190	0.69%	0.585	-0.19%	-0.217	-0.30%	-0.393	-0.80%	-1.044	-0.51%	-0.658	-0.25%	-0.319	-0.40%	-0.650
8	0.93%	0.619	-0.70%	-0.588	1.30%	1.103	-0.04%	-0.030	-0.10%	-0.121	0.57%	0.746	-1.42%	-1.867*	-0.93%	-1.200	-0.35%	-0.446	-0.12%	-0.200
9	-0.02%	-0.015	-0.05%	-0.039	0.81%	0.682	-0.92%	-0.786	0.35%	0.408	-0.18%	-0.233	0.00%	0.001	-0.82%	-1.067	0.63%	0.797	-0.45%	-0.724
10	0.07%	0.044	-1.10%	-0.922	0.20%	0.171	0.57%	0.486	0.70%	0.820	-0.56%	-0.734	-0.76%	-0.992	-0.07%	-0.086	1.20%	1.517\$	-0.66%	-1.069
11	-0.48%	-0.323	0.03%	0.022	1.12%	0.952	0.91%	0.779	-0.37%	-0.433	-0.46%	-0.598	-0.08%	-0.104	-0.17%	-0.220	-0.43%	-0.539	-0.27%	-0.439
12	0.60%	0.402	-0.20%	-0.167	-1.35%	-1.143	0.61%	0.518	0.94%	1.102	0.52%	0.677	-1.66%	-2.171*	-0.59%	-0.767	0.56%	0.706	0.45%	0.733
13	-1.01%	-0.673	-0.26%	-0.217	-0.44%	-0.374	-0.33%	-0.283	0.52%	0.611	0.33%	0.436	0.88%	1.151	0.19%	0.247	0.43%	0.549	0.05%	0.074
14	-0.43%	-0.287	-0.53%	-0.446	-1.39%	-1.180	0.88%	0.748	0.32%	0.372	-0.58%	-0.762	0.01%	0.010	1.59%	2.066*	-0.15%	-0.190	0.20%	0.317
15	-1.64%	-1.094	-0.23%	-0.193	-0.31%	-0.260	1.20%	1.022	2.17%	2.528@	1.12%	1.455\$	0.48%	0.634	-0.01%	-0.008	0.91%	1.151	0.49%	0.789
16	-1.81%	-1.211	0.90%	0.755	0.03%	0.025	1.39%	1.185	-0.49%	-0.570	0.61%	0.789	-0.04%	-0.046	-0.46%	-0.593	0.95%	1.204	-0.05%	-0.081
17	0.54%	0.358	-1.81%	-1.519\$	0.50%	0.422	-1.01%	-0.862	0.32%	0.379	-0.11%	-0.145	0.78%	1.025	0.22%	0.288	0.63%	0.801	0.94%	1.511\$
18	-2.16%	-1.442\$	0.47%	0.390	-0.64%	-0.543	0.88%	0.747	0.98%	1.142	1.10%	1.434\$	-1.23%	-1.617\$	-0.96%	-1.246	-0.63%	-0.803	0.06%	0.096
19	-0.65%	-0.435	-0.76%	-0.641	0.06%	0.052	0.94%	0.806	0.06%	0.064	0.52%	0.681	-0.21%	-0.273	0.01%	0.008	-0.58%	-0.733	-0.06%	-0.099
20	-4.41%	-2.946@	-1.18%	-0.993	0.12%	0.104	1.50%	1.281	-0.74%	-0.865	1.69%	2.202*	-0.42%	-0.553	-0.01%	-0.015	-0.14%	-0.173	-0.24%	-0.395

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: This table shows daily abnormal returns (column a) and test statistics (column b) beginning 20 days before and extending 20 days after the event date, which is centered at $\tau = 0$

Table A-9: Daily Abnormal Returns for Defense Stocks and al-Qaida Messages

Date (τ)	12/13/2001		10/7/2002		2/12/2003		4/7/2003		9/10/2003		1/5/2004		4/15/2004		5/6/2004		10/29/2004		12/16/2004		12/27/2004		1/19/2006	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
-20	-0.62%	-0.416	0.63%	0.413	-0.44%	-0.368	-1.13%	-0.964	1.05%	0.972	1.67%	1.985*	0.42%	0.508	1.25%	1.642\$	-0.47%	-0.633	-0.91%	-1.236	-0.70%	-0.952	-0.87%	-1.262
-19	-0.04%	-0.025	-1.19%	-0.782	1.32%	1.101	-0.49%	-0.416	-0.14%	-0.134	-0.30%	-0.359	-0.09%	-0.110	-0.76%	-0.991	0.35%	0.476	-0.03%	-0.046	1.65%	2.238*	0.44%	0.634
-18	1.60%	1.081	-0.36%	-0.240	0.10%	0.085	-0.48%	-0.410	1.14%	1.058	1.23%	1.453\$	0.68%	0.828	0.05%	0.063	-0.26%	-0.353	-0.44%	-0.596	0.96%	1.295\$	1.13%	1.642\$
-17	1.92%	1.298\$	0.88%	0.579	-0.40%	-0.337	1.09%	0.927	0.26%	0.240	0.34%	0.400	0.17%	0.205	-0.57%	-0.748	-1.01%	-1.364\$	-0.26%	-0.350	-0.76%	-1.028	0.83%	1.206
-16	0.79%	0.535	-0.73%	-0.479	-0.48%	-0.400	1.54%	1.314\$	0.46%	0.425	-1.09%	-1.287\$	-0.06%	-0.070	-0.38%	-0.502	-0.49%	-0.666	0.71%	0.955	-0.33%	-0.441	0.73%	1.050
-15	-0.82%	-0.558	0.75%	0.490	-2.00%	-1.673*	1.66%	1.418\$	0.15%	0.137	1.96%	2.325*	-0.03%	-0.033	-0.08%	-0.109	-1.02%	-1.379\$	-0.34%	-0.456	-0.34%	-0.462	0.17%	0.248
-14	0.30%	0.204	-2.69%	-1.770*	-0.96%	-0.801	0.57%	0.487	-0.35%	-0.328	-0.22%	-0.259	-0.14%	-0.170	0.37%	0.486	-0.14%	-0.187	-0.71%	-0.965	-0.84%	-1.131	0.03%	0.050
-13	-0.09%	-0.059	0.39%	0.256	0.98%	0.819	0.74%	0.634	0.41%	0.381	-1.78%	-2.105*	0.85%	1.029	0.42%	0.556	0.30%	0.402	1.64%	2.222*	-1.15%	-1.555\$	-0.25%	-0.365
-12	-0.30%	-0.203	0.58%	0.384	-0.95%	-0.796	-1.37%	-1.172	-0.58%	-0.533	0.11%	0.131	0.97%	1.171	-2.28%	-2.997@	-0.81%	-1.095	0.95%	1.279	-1.44%	-1.955*	-0.13%	-0.191
-11	0.60%	0.405	0.95%	0.627	1.49%	1.241	-2.48%	-2.111*	-0.14%	-0.129	0.48%	0.573	0.82%	0.998	1.04%	1.362\$	0.15%	0.204	-0.77%	-1.036	-0.24%	-0.322	-1.45%	-2.093*
-10	-0.02%	-0.016	0.04%	0.025	-0.60%	-0.499	1.87%	1.593\$	-0.85%	-0.785	0.64%	0.754	-0.17%	-0.204	0.64%	0.844	-0.27%	-0.366	-0.34%	-0.455	0.44%	0.596	0.83%	1.206
-9	0.71%	0.481	0.13%	0.088	-0.37%	-0.308	-0.45%	-0.385	0.82%	0.756	-0.70%	-0.833	0.99%	1.195	0.45%	0.585	-1.45%	-1.958*	-0.35%	-0.475	0.37%	0.505	-0.34%	-0.492
-8	-0.06%	-0.043	-0.50%	-0.331	0.82%	0.683	-0.17%	-0.149	0.36%	0.334	-0.64%	-0.756	0.53%	0.644	0.80%	1.056	1.25%	1.686*	-0.85%	-1.145	-0.03%	-0.041	0.44%	0.632
-7	0.35%	0.236	0.60%	0.392	-1.71%	-1.425\$	1.36%	1.158	0.47%	0.436	-0.07%	-0.089	0.31%	0.375	-0.66%	-0.865	-1.50%	-2.034*	-1.16%	-1.572\$	-0.63%	-0.850	0.94%	1.353\$
-6	-0.28%	-0.189	-0.91%	-0.598	1.47%	1.232	0.85%	0.729	0.12%	0.110	0.53%	0.632	0.72%	0.871	-0.28%	-0.374	0.63%	0.857	-1.45%	-1.966*	-0.51%	-0.686	0.69%	0.995
-5	-0.52%	-0.355	-0.37%	-0.242	-0.56%	-0.466	0.23%	0.200	0.31%	0.289	0.04%	0.043	1.19%	1.440\$	0.25%	0.326	0.09%	0.120	-0.25%	-0.334	0.71%	0.965	0.01%	0.011
-4	-0.20%	-0.134	-1.69%	-1.109	-0.58%	-0.486	1.20%	1.022	-0.13%	-0.123	0.62%	0.739	-0.75%	-0.914	-1.83%	-2.408@	0.20%	0.277	0.43%	0.582	0.46%	0.627	0.13%	0.184
-3	-0.59%	-0.395	-1.73%	-1.139	0.05%	0.045	-1.26%	-1.072	-0.79%	-0.732	-0.93%	-1.106	0.12%	0.143	-1.09%	-1.428\$	-1.06%	-1.440\$	0.37%	0.494	-1.42%	-1.923*	-0.08%	-0.119
-2	0.64%	0.431	0.59%	0.387	0.16%	0.130	-0.39%	-0.333	0.32%	0.292	-1.12%	-1.324\$	-0.71%	-0.862	0.24%	0.309	-0.52%	-0.702	-0.04%	-0.053	1.22%	1.657*	-0.54%	-0.788
-1	0.69%	0.463	-2.08%	-1.368\$	0.54%	0.453	-1.33%	-1.136	-0.46%	-0.426	-0.19%	-0.220	-0.38%	-0.464	-0.05%	-0.061	-0.59%	-0.805	-0.64%	-0.862	-0.13%	-0.176	0.07%	0.105
0	0.28%	0.187	-0.58%	-0.381	-0.32%	-0.269	-0.25%	-0.212	-0.82%	-0.760	-0.13%	-0.158	-0.06%	-0.077	-0.76%	-0.999	-1.30%	-1.763*	-0.52%	-0.700	-1.02%	-1.379\$	0.09%	0.127
1	0.53%	0.361	-4.41%	-2.900@	-0.52%	-0.430	0.08%	0.072	-0.04%	-0.037	0.34%	0.405	0.44%	0.533	-0.35%	-0.456	0.65%	0.877	0.70%	0.948	0.43%	0.588	0.92%	1.337\$
2	-0.56%	-0.381	-2.25%	-1.481\$	-1.52%	-1.270	0.54%	0.457	0.02%	0.020	0.69%	0.820	0.45%	0.543	-1.77%	-2.320*	-1.20%	-1.625\$	0.45%	0.613	-0.75%	-1.014	-0.44%	-0.638
3	0.37%	0.250	0.16%	0.105	-1.85%	-1.541\$	-0.57%	-0.490	0.09%	0.081	-0.39%	-0.459	-2.45%	-2.961@	0.43%	0.569	2.15%	2.905@	-1.43%	-1.932*	-0.08%	-0.105	1.47%	2.133*
4	-1.24%	-0.839	0.68%	0.450	0.18%	0.148	0.11%	0.096	0.51%	0.467	0.96%	1.133	1.11%	1.344\$	0.48%	0.627	0.10%	0.139	1.21%	1.644\$	-0.34%	-0.463	0.27%	0.396
5	-0.49%	-0.330	-0.66%	-0.432	-0.70%	-0.581	0.21%	0.176	1.57%	1.453\$	0.51%	0.603	0.81%	0.985	0.54%	0.712	0.13%	0.177	-0.14%	-0.190	-1.81%	-2.455@	2.05%	2.970@
6	0.61%	0.410	-0.92%	-0.605	-0.04%	-0.035	0.87%	0.743	0.27%	0.247	0.32%	0.383	0.46%	0.563	-0.08%	-0.108	0.74%	1.000	-1.03%	-1.393\$	-2.53%	-3.423#	-1.29%	-1.865*
7	0.90%	0.611	-1.02%	-0.669	-1.09%	-0.914	1.13%	0.963	-0.12%	-0.110	2.14%	2.542@	0.77%	0.929	-0.89%	-1.173	0.32%	0.434	0.43%	0.577	0.40%	0.536	-0.18%	-0.258
8	-0.07%	-0.050	-1.38%	-0.909	0.03%	0.026	1.23%	1.049	-0.37%	-0.341	-0.50%	-0.589	-0.62%	-0.752	-0.27%	-0.356	0.81%	1.101	-0.76%	-1.027	-1.03%	-1.389\$	0.72%	1.049
9	0.91%	0.614	-1.14%	-0.752	-0.19%	-0.162	0.94%	0.806	-1.42%	-1.314\$	0.31%	0.362	-0.43%	-0.517	0.59%	0.778	0.51%	0.685	-0.09%	-0.118	-1.36%	-1.838*	1.39%	2.017*
10	1.22%	0.823	2.34%	1.537\$	-0.25%	-0.212	1.65%	1.406\$	-0.56%	-0.521	0.97%	1.155	0.18%	0.212	-0.51%	-0.668	-0.60%	-0.808	-0.35%	-0.477	-0.71%	-0.966	-0.29%	-0.420
11	1.28%	0.868	0.22%	0.145	-0.53%	-0.440	0.32%	0.274	-1.46%	-1.347\$	0.03%	0.041	-1.89%	-2.287*	-0.22%	-0.289	-0.15%	-0.196	-1.83%	-2.471@	-2.17%	-2.939@	1.35%	1.957*
12	-1.41%	-0.953	2.36%	1.551\$	-0.22%	-0.188	-0.33%	-0.279	-0.80%	-0.743	-0.74%	-0.879	-0.97%	-1.178	0.07%	0.090	0.50%	0.671	-2.54%	-3.439#	1.08%	1.469\$	0.76%	1.104
13	1.59%	1.074	-0.09%	-0.059	0.90%	0.756	-0.12%	-0.102	0.92%	0.851	-0.02%	-0.029	0.27%	0.325	0.36%	0.478	-0.93%	-1.256	0.38%	0.521	1.87%	2.527@	0.77%	1.121
14	-0.70%	-0.472	-1.88%	-1.234	-1.81%	-1.508\$	1.28%	1.092	0.29%	0.265	1.70%	2.012*	-0.01%	-0.018	0.19%	0.251	-0.06%	-0.080	-1.03%	-1.400\$	-0.84%	-1.133	-1.36%	-1.964*
15	0.10%	0.068	-1.44%	-0.947	0.47%	0.393	0.89%	0.756	0.19%	0.174	-0.47%	-0.553	-0.82%	-0.998	-0.35%	-0.462	-0.49%	-0.669	-1.37%	-1.851*	-0.08%	-0.105	0.58%	0.839
16	0.71%	0.478	2.11%	1.387\$	-0.76%	-0.634	1.90%	1.624\$	0.19%	0.179	-0.89%	-1.051	-0.49%	-0.592	-0.05%	-0.067	-0.27%	-0.369	-0.72%	-0.978	-0.95%	-1.284\$	0.52%	0.753
17	1.11%	0.753	0.77%	0.505	-1.18%	-0.984	-0.63%	-0.540	0.16%	0.150	-1.31%	-1.558\$	-1.87%	-2.268*	0.25%	0.332	0.68%	0.916	-2.18%	-2.953@	-0.10%	-0.131	0.87%	1.254
18	0.43%	0.289	0.14%	0.091	-0.58%	-0.483	0.75%	0.638	0.80%	0.736	-0.52%	-0.614	0.53%	0.644	-0.33%	-0.432	-0.36%	-0.481	1.08%	1.456\$	-0.09%	-0.119	0.37%	0.535
19	-1.18%	-0.797	-0.80%	-0.524	-0.60%	-0.502	0.07%	0.059	-0.22%	-0.204	0.26%	0.308	0.51%	0.616	-0.48%	-0.632	-0.74%	-1.000	1.85%	2.508@	-1.33%	-1.806*	-0.05%	-0.070
20	-0.89%	-0.598	-3.78%	-2.487@	0.89%	0.746	0.11%	0.094	1.03%	0.952	-0.32%	-0.380	0.55%	0.662	0.48%	0.633	1.61%	2.173*	-0.85%	-1.144	0.14%	0.195	-0.27%	-0.391

The symbols \$,*,@, and # denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test.

Note: This table shows daily abnormal returns (column a) and test statistics (column b) beginning 20 days before and extending 20 days after the event date, which is centered at $\tau = 0$

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