

An Assessment of Terrorism-Related Investing Strategies

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Today, more than six years after the attacks of September 11, 2001, hereafter referred to as 9/11, the threat of terrorism and politically motivated violence continues to impose an enormous cost on both U.S. and international companies. Indeed, many corporate executives believe terrorism-related business risks will increase in the coming years. According to a 2006 survey of 434 CFOs in the U.S., Europe, and Asia conducted by Duke University and *CFO* magazine, direct and indirect costs of terrorism have as much as doubled in the past five years, ranging now from 1.6% to 2.8% of revenues. The direct costs include insurance premiums for terror-related business interruptions and security-related expenditures and the indirect costs include the higher costs of oil and energy, reduced executive air travel, lost productivity, and lower consumer spending due to terror fears. Lloyd's of London [2007] reported a survey of executives in which 54% of respondents predicted an increase in the risk of political violence and terrorist activity for their companies.

Academic research on terrorism and its potential consequences for the global economy and capital markets has also blossomed in the past five years. Much has been written about the immediate impact of the 9/11 attacks on bond yields, stock market prices, oil prices, aggregate consumption, and aggregate investment activity (OECD [2002]; Lenain, Bonturi, and

Koen [2002]; and Blomberg, Hess, and Orphanides [2004]). A number of researchers have examined the effect of the 9/11 event on stock prices, stock price volatility, and systematic risks for U.S. markets (Hon, Strauss, and Yong [2004]; Burch, Emery, and Fuerst [2003]; Choudhry [2003]; Cummins and Lewis [2003]; Poteshman [2006]; and Kallberg, Liu, and Pasquariello [2005]), as well as to the regulatory responses surrounding the impact of 9/11 on U.S. investment markets (Brown et al. [2004] and Doherty, Lamm-Tennant, and Starks [2003]). Fewer studies exist on the broader consequences of terrorism activity, in general, and on the financial markets, in particular.¹ Consider, for example, Chen and Siems [2004] and Guidolin and La Ferrara [2005], who studied the impact on national index returns of a number of major geopolitical events (e.g., the 1990 Iraqi attack on Kuwait) over the last 60 years; Eldor and Melnick [2004] and Berrebi and Klor [2005], who focused on attacks against Israeli companies during the 1998–2000 Palestinian conflict; and Karolyi and Martell [2007] who found large, negative stock price declines—an average -0.83% —on days that terrorist attacks occurred against 75 U.S. and international companies over the period from 1995 to 2003.

What we still do not know—and what this article addresses—is whether terrorism-related activity has any longer-run consequences for investment returns and risks. Most

studies cited in this article have used event-study methodology to assess the wealth impact of specific attacks and geopolitical events; these price reactions, as measured, may be short term, transitory, and possibly even idiosyncratic in nature. Investors do appear to be net sellers of targeted firms, but we do not know if this bias reflects changes in investor forecasts of these firms' future cash flows due to direct asset losses or changes in market beliefs about the inherent riskiness of a firm's (and possibly related firms') operations or investment activity. Event-study findings also may partly reflect past management decisions or business conditions existing within the firm or its industry that fostered unusually high exposure to risk of a terrorist attack in the first place. I avoid these difficulties by taking a long-horizon investment approach. Do stocks of firms that have higher exposure to terrorism-related risks earn higher returns? Do portfolios of such firms have measurably different market-related or other systematic market risks? How much tracking error is assumed by portfolios that seek to limit their exposure to stocks with high terrorism-related risk?

To answer these and other questions, I construct a new terrorism risk score for every constituent firm in the S&P 500 Index from 1994 to 2006. Specifically, a firm's exposure score compiles the number of terrorism incidents in a given country over the preceding 12-month period for each country in which the firm had business operations or investment activity. Determination of the countries in which firms had foreign operations was collected by hand from various issues of Uniworld Business Publications' *Directory of American Firms Operating in Foreign Countries* (1994–2005). Terrorism event counts are drawn from two sources: 1) *Patterns of Global Terrorism*, a report prepared by the Office of the Coordinator for Counterterrorism of the U.S. Department of State in compliance with a mandate from the U.S. Congress (Title 22 of the U.S. Code, Section 2656f(a)); and 2) the "Terrorist Attack Archives," compiled by the Terrorism Research Center, Inc., an independent institute dedicated to research on terrorism.

I compute monthly returns for portfolios constructed from these scores and use performance-attribution time-series regression analysis to assess return and systematic risk differences between high- and low-terrorism-risk exposure portfolios. I find that the terrorism-related risk exposure portfolio would have earned, on average, an economically small and statistically insignificant premium of 17.8 basis points (bps) per month with a modest tracking

error of 2.8% per month. Interesting differences exist in systematic exposures to market risks and in factors related to size, market-to-book ratios, and momentum. Notwithstanding a battery of robustness tests based on subperiod analysis, alternative attribution model specifications, and various terrorism-score and portfolio-construction approaches, it appears that terrorism is not a systematic risk priced by financial markets.

An interesting byproduct of the analysis is that it facilitates assessment of the investment performance of so-called terror-free portfolios. Such investment portfolios screen out individual holdings of companies which have operations in countries designated by the U.S. Department of State as state sponsors of terrorism, such as North Korea, Syria, Sudan, and Iran. These portfolios have become very popular recently. In 2006, the Missouri Investment Trust, in conjunction with the Conflict Securities Advisory Group,² became the first public agency in the U.S. to implement a terror-free investment fund.³ In December 2007, the U.S. Congress passed the Sudan Accountability and Divestment Act to give states and local governments the authority to divest from companies invested in Sudan. Now, over 20 U.S. states—including California, Florida, Ohio, Connecticut, Illinois, and New Jersey—have legislation (passed, proposed, or pending) which forces their public pension funds to divest holdings from Iran or Sudan.⁴ As a result, I evaluate a second strategy of a terror-free portfolio of S&P 500 stocks in which stocks are screened if they have operations in the State Department's list of designated countries. Typically, there are only 15 to 20 U.S. stocks so identified in a given year, although they are large in market capitalization and draw large investment weights in a value-weighted strategy. However, I find that the terror-free portfolio earns a very small –1.6 bps discount per month with a tracking error of 21 bps per month relative to the S&P 500 Index.⁵

The remainder of the article is organized as follows. The first section describes the data sources used and the construction of the terrorism exposure scores. Summary statistics of the stocks with the highest and lowest scores are discussed in the second section, and the performance-attribution regression analysis is presented in the third section. The fourth section provides an assessment of the terror-free investment strategy. The final section concludes, including a discussion of many of the limitations of this approach.

DATA SOURCES AND THE CONSTRUCTION OF TERRORISM EXPOSURE SCORES

A description of the data sources used in the study and an explanation of the construction process for the terrorism exposure scores are covered in this section.

Data

Three major data sources are used in this study: one database is used to determine in which countries the constituent stocks of the S&P 500 Index have foreign operations, and two other databases are used to count the number of terrorism incidents occurring each year in a given country for which the firm of interest has operations.

The database used to determine a firm's location of operations is the *Directory of American Firms Operating in Foreign Countries* (Uniworld Directory) which includes over 4,000 U.S. firms with 63,000 foreign subsidiaries and affiliates in 191 countries.⁶ Each entry contains the company's U.S. address, contact information, principal product or service, and lists the foreign countries in which the firm has a branch, subsidiary, or affiliate with respective contact information. According to the *Directory* [2001, p. V], the primary sources of information are

questionnaires completed by the U.S. parent company, annual reports, and other publications. Direct telephone and fax contact is used for verification and clarification. Each firm in the previous edition is sent an announcement of a new revised edition along with its former entry to provide current data. If no response is received and if there is no evidence that the firm has gone out of business, the previous entry is carried forward.

No doubt this approach introduces a risk of survivorship bias into the study and may create a bias toward larger stocks for which higher quality data is available. The *Directory*, however, is the most comprehensive source for the information required. The biggest deficiency of the *Directory's* data is that a firm's operations are not quantified in terms of the assets in place or the fraction of foreign sales. For some firms, a country's operations will be sizeable in terms of property, plant, and equipment, but for many other firms a foreign address may simply reflect a sales office in the country. This naturally creates much noise in the scores and rankings. Typically, about two-thirds

of the S&P 500 Index constituent firms had a record in Uniworld; some overseas-based constituents, such as Schlumberger (Netherlands Antilles) and Royal Dutch Shell (U.K., Netherlands), had no records, and the remainder were deemed domestic companies.

I obtain terrorist attack counts by country and by year from two databases. The first database is the annual *Patterns of Global Terrorism* report prepared by the Counterterrorism Office of the U.S. Department of State. This report has been available since 1995 and includes a chronological appendix that lists details of all terrorist incidents so classified by the Department of State. This report is submitted in compliance with Title 22 of the U.S. Code, Section 2656f(a), which requires that the State Department provide Congress a full and complete annual report on terrorism. One advantage of the data is that the Counterterrorism Office provides an explicit definition of terrorism in terms of politically motivated violence that is "perpetrated against noncombatant targets by subnational groups or clandestine agents," and lists these groups by name and home country each year. A review of all the appendices available, from 1995 to 2003, shows a total of 1,057 acts of terrorism.⁷

The second database used to count the number of terrorist attacks is the Terrorism Research Center (Terrorism.com), which is an independent institute founded in 1996 and dedicated to the research of terrorism, information warfare, and security.⁸ I obtain data on attacks that killed at least one person and sort by year and country. This second source for terrorism counts serves as a robustness check of the State Department's Counterterrorism Office appendices. The Terrorism.com archive is more extensive than the information provided by the State Department with a time series back to 1946, but limits the definition of an attack to one including a human death. By my count, Terrorism.com lists a total of 1,268 incidents from 1995 to 2005.

A list of the most recent S&P 500 firms was compiled from the Standard & Poor's website, which includes additions and deletions from 2000. This information was supplemented for the period from 1994 to 1999 by the report "S&P 500 Additions and Deletions 1976-2000."⁹ The exclusive focus on the S&P 500 as the investment universe is, of course, an arbitrary choice. The result is a trade-off between the benefit of a well-known, easily investable investment strategy composed of the most actively traded stocks in the U.S. and the cost of possibly inadequate dispersion in the resulting terrorism exposure

scores. The terror-free strategy is also hampered by this choice, because many of the targeted stocks on the Department of State's "black list" of firms in designated terrorist-sponsoring countries are domiciled outside the U.S.

Construction of Terrorism Exposure Scores

The terrorism exposure scores are computed for each of the stocks in the S&P 500 Index constituent list each year. The scores sum the number of terrorism incidents in a country for each country in which the firm has operations. The countries in which firms have foreign operations are determined from the *Uniworld Directory*. Terrorism event counts are from either the Department of State's Counterterrorism Office report or Terrorism.com's terrorist attack archives. The analysis that follows uses raw scores as well as adjusted scores; an adjusted score is calculated by deflating the raw score by the number of countries in which the company operates. This adjustment is made to control for the possibility that the terrorism exposure scores simply manifest themselves as scores for multinationality. Thus, stocks are ranked not only on whether they have foreign operations in countries with higher levels of terrorist activity, but also on whether they have strategically chosen foreign operations in those countries relative to other firms which have strategically chosen to avoid them.

The terrorism exposure scores are known before portfolio construction takes place. For the monthly returns of the stocks sorted into portfolios for year t , the terrorism counts used in the scores for ranking purposes are drawn from year $t-1$, and a firm's country of foreign operations is drawn from the *Uniworld Directory* based on the pre-existing edition (years $t-1$ or $t-2$, as the directories are published almost biannually). The stocks are re-sorted once a year based on the scores at the end of each calendar year. If firms are added to the S&P 500 during a calendar year, I do not compute their scores nor include them in the portfolios until the end of that calendar year to be included in the portfolios for the next calendar year. If firms are deleted from the S&P 500 during a calendar year, they are dropped from the portfolios in the month when deletion occurs and the portfolio is rebalanced accordingly. The portfolios are value weighted and are rebalanced each month using end-of-month market capitalizations.

Exhibit 1 presents the distribution of terrorism events over the entire period of analysis by country of attack for both the Department of State data and Terrorism.com

data. The country with the largest number of incidents using State Department data is India (279, 26% of total), followed by Colombia (103, 10%), Israel (54, 5%), Yemen (53, 5%), and Angola (30, 3%). Terrorism.com's highest count occurs in Iraq (300, 23%), followed by India (184, 14%), Israel (100, 8%), Afghanistan (83, 7%), and Colombia (70, 6%). Note that the State Department data extends only through 2003 and does not include the years 2004 and 2005 for which Terrorism.com's archives show many incidents in Afghanistan and Iraq (in fact, 347 of the 656 incidents reported in 2004 and 2005). These are predominantly emerging economies, which is not surprising given the findings of Krueger and Laitin [2003] and Krueger and Maleckova [2003] that the origins of terrorist activity exist in countries that suffer political oppression and an underdeveloped economy. These two sources exhibit considerable consistency in the distribution of incident counts across countries. Exhibit 2 illustrates how the annual count of terrorism events has evolved over the past 12 years. The Terrorism.com count averaged around or below 50 per year until 2000, after which it increased exponentially to 400 incidents in 2005. The State Department count rises from 1995, peaking in 1999 and again in 2003, with a modest decline between those peak years.

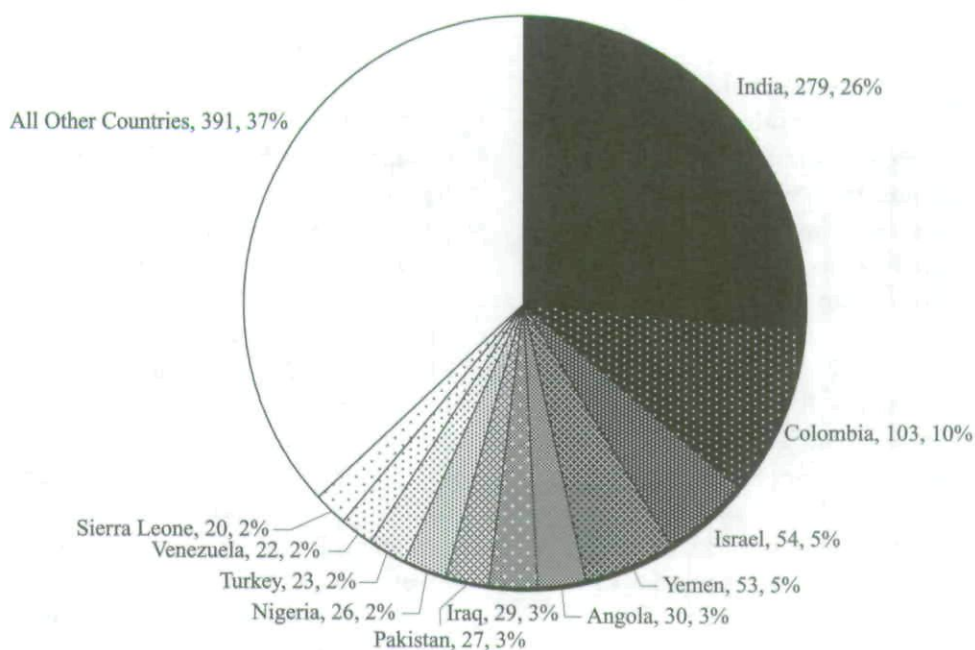
Exhibit 3 presents summary statistics of the terrorism exposure scores across firms and years. Panel A of Exhibit 3 reports distributional statistics for the raw and adjusted scores using the Terrorism.com attack counts. Panel B of Exhibit 3 reports the same using the State Department counts. In each panel, statistics are reported on the number of firms in the S&P 500 each year for which there is some record of foreign operations in the *Uniworld Directory*; the number of firms for which there are no records because the constituents are foreign domiciled; and the number of firms remaining which are designated as domestic firms. Note that the terrorism scores of the firms with records of foreign operations may still be zero in terms of count, because no terrorist attacks had taken place in those countries. Typically, between 300 and 400 companies in the S&P 500 have a record of foreign operations. The average raw scores are clearly increasing over time with the overall level of terrorist activity, as shown in Exhibit 3. The scores in both panels average around 3 in 1994 and 1995, and rise as high as 30 in the years 2003 to 2005. In any given year, the correlation of the scores based on the two sources averages around 0.90. The cross-sectional dispersion in the scores across firms also rises over time

EXHIBIT 1

Terrorism Events by Country

Terrorism Events by Country 1995–2003

(Source: U.S. Department of State)



Terrorism Events by Country 1994–2005

(Source: Terrorism.com)

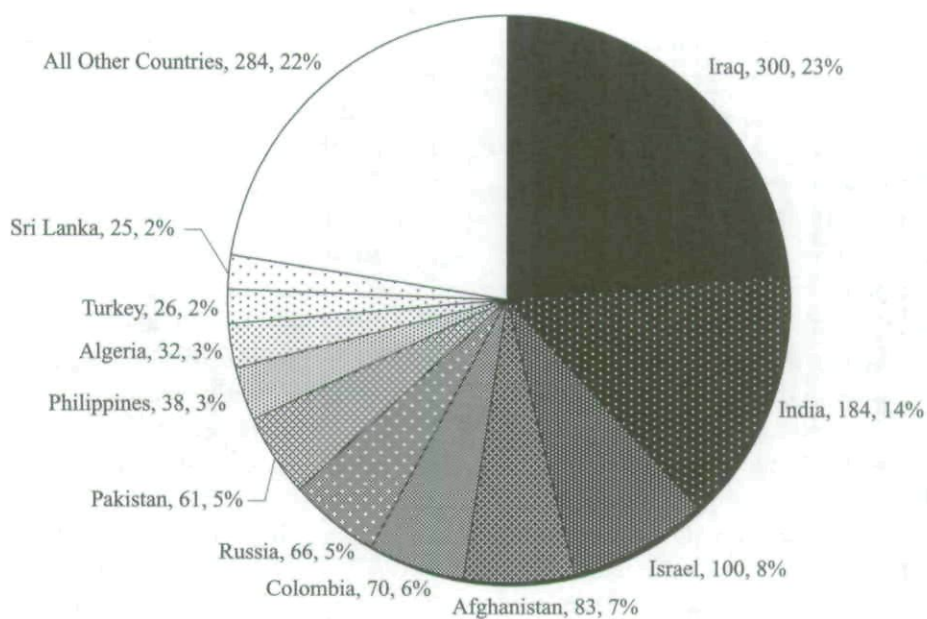
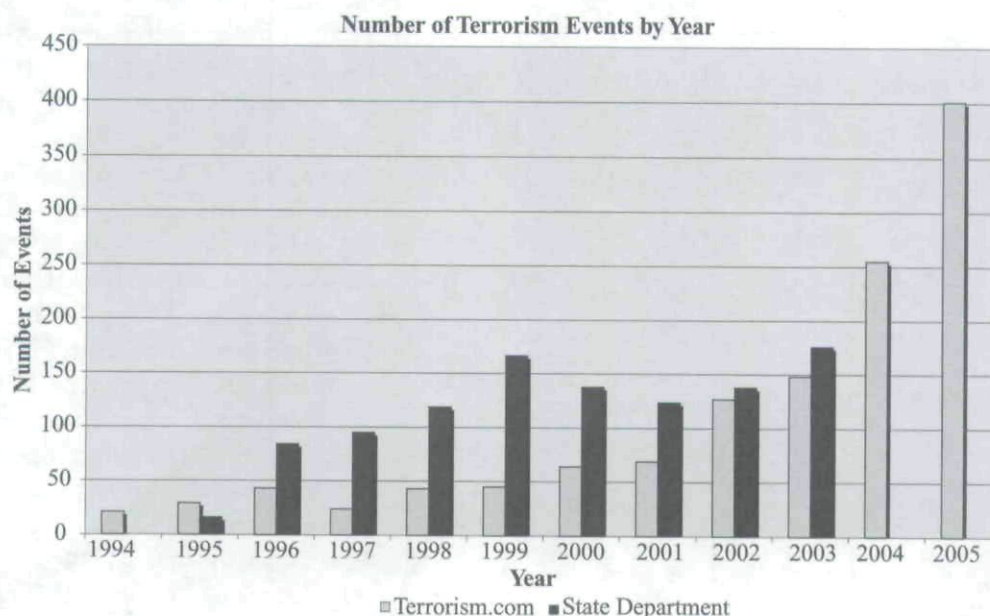


EXHIBIT 2

Terrorism Events by Year



(i.e., the coefficient of variation exceeds one). The maximum scores by the end of the sample period are as high as 302 for the Terrorism.com scores and 133 for the State Department scores. More interesting, perhaps, are the adjusted scores which control for the degree of multinationality and focus on a firm's strategic choice to locate foreign operations in a given country relative to the country's level of terrorist activity. The companies with the highest raw scores typically have listed foreign operations in 20 different countries, while those with the lowest raw scores have operations in less than 10. As a result, the adjusted scores average about one-tenth the magnitude, ranging from 0.20 in 1994 and 1995 to 1.20 in 2003 to 2005. In any given year, the correlation between the raw and adjusted scores (using either data source for the count) averages around 0.55. There still appears to be considerable cross-sectional variation in the adjusted scores, with the coefficient of variation well over one—a critical ingredient for successful portfolio sorting—and it also increases over the sample period.

There is considerable overlap in the firms with the highest terrorism exposure scores for the two measures, especially in recent years. Several firms, including Alltel, Deluxe Corporation, Cendant, and Qualcomm, have high adjusted scores and repeat as high-score firms across years. Some of the scores may be misleading, however. Alltel, for example, has operations listed in three foreign

countries—U.K., Hong Kong, and India—but its high score clearly stems from the exposure of its Indian operations. As noted earlier, the *Uniworld Directory* does not furnish data on the scope of operations, but Alltel's 10-K, 10-Q, and 8-K SEC filings and media reports suggest that its exposure in India is considerable.¹⁰ Sigma Aldrich, a biotechnology and chemicals firm, operates primarily in India and Israel with units in Brazil and China, which are their focus countries.¹¹ No industry concentration is obvious among these top firms; the portfolios used in the study are similarly distributed across industries.

SUMMARY STATISTICS

I use a number of methods to construct portfolios of stocks sorted by terrorism exposure scores. The initial focus is on quintile portfolios. For each year in the study period, I sort the stocks in the S&P 500 which have a record of foreign operations—usually two-thirds of the sample—from highest to lowest and construct value-weighted portfolios of the top (bottom) 20% of stocks. I also construct value-weighted portfolios of the remaining domestic stocks.

Exhibit 4 furnishes preliminary descriptive statistics on various financial and accounting measures (averaged across firm-years) of firms in the quintile with the highest and lowest terrorism exposure scores (adjusted) using the U.S. Department of State data on the count of terrorism

EXHIBIT 3

Summary Statistics of Terrorism Exposure Scores by Year

Panel A: Terrorism.com Exposure Scores

Year	Number of Firms Operating	Number of Unlisted Foreign Firms	Number of Domestic Firms	Raw Scores				Adjusted Scores			
				Average	Median	Standard Deviation	Skewness	Average	Median	Standard Deviation	Skewness
1994	320	8	172	1.93	1.00	2.31	2.01	0.12	0.11	0.20	9.70
1995	310	11	179	4.12	3.00	4.25	1.60	0.26	0.25	0.21	2.28
1996	317	10	173	6.29	5.00	6.33	1.38	0.41	0.38	0.33	4.34
1997	308	10	182	2.00	1.00	2.79	1.84	0.10	0.08	0.20	9.90
1998	299	8	193	5.92	1.00	9.48	1.59	0.29	0.14	0.39	2.34
1999	334	9	157	8.82	1.00	11.42	0.92	0.38	0.13	0.67	5.05
2000	314	8	178	13.53	4.00	16.37	0.93	0.62	0.33	0.92	8.33
2001	370	9	121	13.43	2.00	16.68	0.91	0.59	0.18	1.21	17.00
2002	368	3	129	26.27	8.00	32.60	1.03	1.09	0.61	1.91	28.00
2003	385	2	113	24.39	14.00	30.23	1.12	1.04	0.69	1.39	16.00
2004	379	2	119	23.78	10.00	29.91	1.33	1.04	0.91	1.19	15.00
2005	380	2	118	29.68	17.00	37.21	1.96	1.16	1.07	1.21	17.00

Panel B: U.S. Department of State Terrorism Exposure Scores

Year	Number of Firms Operating	Number of Unlisted Foreign Firms	Number of Domestic Firms	Raw Scores				Adjusted Scores			
				Average	Median	Standard Deviation	Skewness	Average	Median	Standard Deviation	Skewness
1995	310	11	179	3.81	3.00	4.48	1.17	0.22	0.17	0.25	2.73
1996	317	10	173	12.91	10.00	12.58	1.15	0.86	0.80	0.61	1.98
1997	308	10	182	8.84	2.00	13.06	1.64	0.39	0.20	0.50	3.67
1998	299	8	193	15.72	3.00	23.03	1.54	0.76	0.40	0.85	5.43
1999	334	9	157	32.15	14.50	34.87	1.06	1.50	1.25	1.35	12.67
2000	314	8	178	22.47	5.00	28.21	1.05	0.99	0.45	1.56	14.67
2001	370	9	121	22.80	6.50	28.20	0.93	0.91	0.49	1.37	12.67
2002	368	3	129	33.89	6.00	41.97	0.83	1.44	0.63	2.26	22.67
2003	385	2	113	29.36	6.00	37.14	1.03	1.28	0.61	2.02	20.00

incidents. I also report statistics for domestic firms for which no record of foreign operations exists in the *Uniworld Directory*. The financial and accounting measures are obtained from the monthly files of the Center for Research on Security Prices (CRSP) and S&P Compustat. Detailed data definitions and their sources are reported in the appendix.¹² I report distributional statistics across firms and years for the following variables: log market capitalization (LN[Market Cap]), book-to-market ratio [B/M], price level [Price], earnings-to-price ratio [E/P], dividend yield [D/P], common shares traded in millions of shares per year, Tobin's *q* (the ratio of market value of assets to its book value), the number of countries in which firms have foreign operations [Number of Countries with Ops], compounded gross returns for preceding months *t* - 12 to *t* - 1 [Prev Year Return], and standard deviation of the monthly returns in the preceding year [Std Dev (Prev Year)]. I also present the results of two-sided *t*-tests of the difference in means of the highest- and lowest-scoring groups, the highest-scoring group and domestic stocks, and the lowest-scoring group and domestic stocks.

The firms with the highest terrorism scores have a higher market capitalization, lower book-to-market ratio (0.41 versus 0.54), higher Tobin's *q* ratio (2.39 versus 1.80), and are much more actively traded (657 millions shares versus 413 million shares) than either the stocks with low terrorism scores or the domestic stocks. They are larger and have a growth orientation. It is more difficult to discern a value or growth tilt using the earnings and dividend yield ratios, which are not significantly different. As noted earlier, the highest-scoring stocks are still the most multinational, even though the sorting takes place on the basis of adjusted scores. The highest-scoring stocks operate in 21 countries, on average, and operate in as many as 58 countries. In contrast, the lowest-scoring stocks have operations in an average of 4.5 countries with a maximum of 31. Finally, there is no difference across the three groups of stocks by the recent year's compounded return (a proxy for stock price momentum) or by the recent year's unconditional volatility.

EXHIBIT 4

Summary Statistics of Firm Attributes

Panel A: Most Exposed Firms by Adjusted Score (599 observations)

	Mean	Median	Std Dev	Quantiles			
				1%	25%	75%	99%
LN(Market Cap)	9.07 ^{***,###}	8.99	1.35	6.34	8.06	10.03	12.01
B/M	0.41 ^{***,###}	0.35	0.36	(0.33)	0.20	0.53	1.67
Price	47.36 ^{***,###}	42.16	38.10	4.31	27.86	59.63	143.08
E/P	0.007 ^{###}	0.041	0.277	(0.713)	0.019	0.064	0.150
D/P	0.018 ^{**}	0.016	0.016	-	0.005	0.027	0.068
Common Shares Traded	629 ^{***,###}	229	1,413	23	106	637	8,307
Tobin's q	2.386 ^{***,###}	1.675	2.148	0.854	1.246	2.631	11.160
Number of Countries with Ops	21.0 ^{***,###}	21.5	14.0	-	8.3	30.0	58.1
Prev. Year Return	20.3% [*]	13.5%	115.3%	-65.4%	-12.3%	37.5%	190.0%
Std. Dev. (Prev. Yr.)	10.5%	9.2%	6.0%	3.6%	6.6%	12.3%	33.4%

Panel B: Least Exposed Firms by Adjusted Score (594 observations)

	Mean	Median	Std Dev	Quantiles			
				1%	25%	75%	99%
LN(Market Cap)	8.74 ⁺⁺⁺	8.72	1.10	6.51	8.03	9.44	11.63
B/M	0.54	0.44	0.37	0.03	0.27	0.72	1.58
Price	41.35	38.67	22.68	4.58	26.00	53.64	107.68
E/P	0.024 ⁺	0.049	0.172	(0.408)	0.027	0.069	0.147
D/P	0.016 ⁺⁺⁺	0.015	0.014	-	0.005	0.024	0.060
Common Shares Traded	413	185	834	10	92	410	3,161
Tobin's q	1.799 ⁺⁺⁺	1.348	1.172	0.846	1.092	2.074	6.255
Number of Countries with Ops	4.5	3.0	5.6	-	1.0	5.0	31.1
Prev. Year Return	12.5% ⁺⁺	9.2%	41.7%	-69.3%	-12.4%	33.3%	136.8%
Std. Dev. (Prev. Yr.)	10.1%	8.8%	5.4%	3.5%	6.5%	12.0%	29.9%

Panel C: Domestic Firms (1,385 observations)

	Mean	Median	Std Dev	Quantiles			
				1%	25%	75%	99%
LN(Market Cap)	8.73	8.74	1.00	6.27	8.13	9.30	11.10
B/M	0.52	0.45	0.41	0.03	0.24	0.71	1.82
Price	40.84	36.38	24.80	5.47	25.92	50.28	114.92
E/P	0.037	0.050	0.128	(0.363)	0.029	0.071	0.181
D/P	0.019	0.012	0.020	-	0.000	0.030	0.075
Common Shares Traded	365	182	557	14	96	392	2,910
Tobin's q	2.048	1.334	1.929	0.814	1.090	21.60	10.187
Number of Countries with Ops	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Prev. Year Return	19.5%	15.3%	45.8%	-76.9%	-8.0%	41.8%	161.4%
Std. Dev. (Prev. Yr.)	10.1%	8.4%	6.2%	3.1%	6.1%	12.2%	34.8%

Note: *, **, and *** indicate statistically significant differences at 10%, 5%, and 1%, respectively, between most- and least-exposed firms based on a two-sided t-test of means; #, ##, and ### are the same between most-exposed and domestic firms; +, ++, and +++ are the same between least-exposed and domestic firms.

The most important lesson from the preliminary analysis of the attributes and profiles of these stocks is that in any multifactor model used in the performance attribution analysis, I need to control for size, value, and, although less so, momentum. I have argued previously that no obvious industry concentration exists, but I may need to control for varying market risk exposures arising from changing macroeconomic conditions. I perform performance attribution analysis using an alternative multifactor specification for this purpose.

PERFORMANCE ATTRIBUTION ANALYSIS OF TERRORISM-RELATED INVESTING

In this section, I assess the relationship between terrorism exposure scores and subsequent returns. Exhibit 5 presents summary statistics on the monthly returns of value-weighted portfolios of stocks with the highest and lowest quintile of terrorism exposure scores from the previous year. I report the mean, standard deviation [Std Dev], skewness, and kurtosis coefficients of the returns of these portfolios, as well as those of the domestic portfolios. Results, based on both raw and adjusted scores, are reported separately in Panel A of Exhibit 5 using the Terrorism.com incident counts and in Panel B using the State Department counts. Finally, for each experiment, I report return statistics for hedge portfolios. A hedge portfolio takes a long position in the portfolio of stocks with the highest terrorism exposure scores and a short position in either the portfolio of stocks with the lowest scores or in the domestic portfolio. The statistics are reported for a longer period of analysis (1995–2006, 144 monthly returns) using the Terrorism.com data and a shorter period (1996–2004, 108 monthly returns) using the State Department data.

The first important result is that the returns on the portfolios with the highest terrorism exposure scores are, on average, lower than those with the lowest scores and the domestic portfolio. These findings are consistent in both panels and for those based on raw or adjusted scores. For example, using the Terrorism.com counts in adjusted form, the average return over the period is 0.78% per month for the highest terrorism score portfolio and 0.92% for the lowest terrorism portfolio, which is a difference of 14 basis points (bps) per month, or 1.69% on an annualized basis. This difference is statistically indistinguishable from zero (t -statistic of 0.79, not reported) and economically small, and is the smallest return spread

reported. Yet, even the difference of 31 bps per month (3.78% annualized) using the raw scores and the State Department data (Panel B of Exhibit 5) is small. The volatility of the highest terrorism score portfolio is modestly lower than that of the lowest score portfolio or the domestic portfolio. I offer additional evidence that the returns are somewhat more negatively skewed and less fat-tailed (lower positive excess kurtosis).

One possible explanation for the absence of large return performance differences is that they mask differences in the riskiness, or style, of the different portfolios. Researchers have identified several equity characteristics that explain differences in realized returns. In addition to differences in exposure to the market factor (beta), a firm's market capitalization, book-to-market ratio (or other value characteristics), and immediate past returns (momentum) have all been shown to significantly forecast future returns.¹³ Exhibit 4 shows that these characteristics for the stocks in the highest and lowest terrorism score portfolios are different. It may be that the highest terrorism score portfolio returns are higher than those of the lowest terrorism score portfolio once these style differences are taken into account; that is, small, value firms may have significantly outperformed large, growth stocks over the 1995–2006 period to such an extent that their preponderance in the lowest terrorism score portfolio may have overwhelmed its performance.

Several methods have been developed to account for these style differences in a performance attribution system. I employ one method here and use another in robustness tests. The multifactor model of Fama and French [1993] extended by Carhart [1997] is estimated by

$$R_{it} - r_{ft} = a_i + \beta_i [R_{mt} - r_{ft}] + s_i SMB_t + h_i HML_t + m_i MOM_t + e_{it}$$

where R_{it} , R_{mt} , and r_{ft} are the monthly returns to asset i , the value-weighted market portfolio, and the risk-free rate, respectively, and the terms SMB_t (small minus big), HML_t (high minus low), and MOM_t (winner minus losers momentum) are monthly returns on zero-investment factor portfolios designed to capture size, book-to-market, and momentum effects, respectively. There is on-going debate about whether these factors proxy for risk; I take no position other than to employ this model for performance attribution by firm characteristics. I interpret a_i , the estimated intercept coefficient in this time-series regression, as the abnormal return in excess of what could

EXHIBIT 5

Performance Attribution Regressions for Terrorism Exposure Portfolios

Panel A: Terrorism.com Exposure Scores (1995–2006, 144 monthly returns)

	Domestic Portfolio	Raw Exposure Scores				Adjusted Exposure Scores			
		Least Exposed	Highest Exposed	Highest – Least	Highest – Domestic	Least Exposed	Highest Exposed	Highest – Least	Highest – Domestic
α_i	0.16%	0.24%	0.23%*	0.01%	0.07%	0.22%	0.17%	-0.05%	0.01%
β_i (Mkt-Rf)	0.28***	0.21***	0.06***	0.98**	0.77	0.25***	0.32***	0.85	0.98
	0.97	1.07	0.93	-0.15	-0.04	1.07	1.02	-0.04	0.05
s_i (SMB)	0.00***	0.00***	0.00***	0.02*	0.49***	0.00***	0.00***	0.52	0.37**
	-0.14	-0.20	-0.33	-0.14*	-0.19	-0.19	-0.29	-0.10	-0.15
h_i (HML)	0.00***	0.00**	0.00***	0.03***	0.00	0.00*	0.00	0.13	0.01***
	0.23	0.13	-0.17	-0.29	-0.40	0.13	-0.01	-0.14	-0.24
m_i (MOM)	0.00	0.04***	0.00	0.00*	0.00	0.05***	0.86**	0.12	0.00*
	0.01	-0.10***	-0.03	0.07	-0.03	-0.11	-0.07	0.04	-0.07
R^2	0.87	0.00	0.20	0.09	0.43	0.00	0.03	0.41	0.07
	0.83	0.82	0.91	0.10	0.16	0.82	0.85	0.00	0.13
s_e	1.67%	2.07%	1.35%	2.56%	2.54%	2.09%	1.90%	2.82%	2.47%
Mean	0.94%	0.94%	0.72%	-0.22%	-0.22%	0.92%	0.78%	-0.14%	-0.16%
Std. Dev.	4.11%	4.95%	4.46%	2.70%	2.77%	4.95%	4.83%	2.82%	2.65%
Skewness	(0.56)	(0.29)	(0.46)	(0.46)	(0.48)	(0.27)	(0.50)	(0.35)	0.18
Kurtosis	0.98	1.47	0.39	0.47	3.89	1.47	0.94	0.46	1.52

Panel B: U.S. Department of State Terrorism Exposure Scores (1996–2004, 108 monthly returns)

	Domestic Portfolio	Raw Exposure Scores				Adjusted Exposure Scores			
		Least Exposed	Highest Exposed	Highest – Least	Highest – Domestic	Least Exposed	Highest Exposed	Highest – Least	Highest – Domestic
α_i	0.25%	0.16%	0.33%**	0.16%	0.07%	0.24%	0.25%	0.01%	0.01%
β_i (Mkt-Rf)	0.17***	0.45**	0.03***	0.54***	0.78	0.28***	0.16**	0.96	0.99
	0.99	1.10	0.88	-0.22	-0.11	1.05	0.94	-0.12	-0.05
s_i (SMB)	0.00***	0.00***	0.00***	0.00*	0.08**	0.00***	0.00***	0.09	0.38
	-0.14	-0.17	-0.33	-0.15	-0.19	-0.18	-0.22	-0.02	-0.07
h_i (HML)	0.00***	0.00***	0.00***	0.02***	0.00***	0.00***	0.00	0.75**	0.26***
	0.27	0.38	-0.13	-0.52	-0.40	0.36	0.07	-0.30	-0.20
m_i (MOM)	0.00	0.00	0.01*	0.00*	0.00	0.00	0.26	0.00	0.01
	0.02	0.04	-0.04	-0.09	-0.06	-0.01	-0.04	-0.03	-0.06
R^2	0.58	0.25	0.07	0.06	0.16	0.85	0.19	0.49	0.18
	0.86	0.84	0.91	0.27	0.21	0.81	0.87	0.11	0.08
s_e	1.81%	2.08%	1.39%	2.54%	2.48%	2.23%	1.84%	2.77%	2.37%
Mean	0.91%	0.94%	0.63%	-0.31%	-0.28%	0.94%	0.72%	-0.22%	-0.19%
Std. Dev.	4.59%	5.03%	4.76%	2.98%	2.72%	4.98%	4.74%	2.87%	2.49%
Skewness	(0.52)	(0.29)	(0.43)	(0.36)	(0.29)	(0.28)	(0.53)	(0.52)	0.09
Kurtosis	0.39	0.75	-0.01	0.46	2.27	0.69	0.22	1.59	0.89

Note: Coefficients and associated p -values are reported with adjusted R^2 , standard error of the regression (s_e), and summary statistics for the excess returns. *, **, and *** indicate statistically significant differences at 10%, 5%, and 1%, respectively.

have been achieved by passive investments in the four factor portfolios.¹⁴

Exhibit 5 presents the results of the performance-attribution regression analysis. The coefficient estimates are reported with the associated p -values, as well as the adjusted R^2 and residual standard error of the regression (s_e). I interpret s_e as one form of portfolio tracking error relative to a combination portfolio of the four factor portfolios. The results show that the portfolios of stocks with

the highest terrorism scores have statistically significantly lower market risks (β_i), significantly larger (in absolute terms) negative SMB coefficients (s_i), and significantly larger (in absolute terms) negative HML coefficients (h_i) than corresponding portfolios with the lowest terrorism scores or than domestic portfolios. There is no reliable difference among the portfolios in MOM coefficients. These findings confirm preliminary indications in Exhibit 4 that the stocks with the highest terrorism scores are larger and

growth oriented. These differences are most easily noted for the spread portfolios that take a long position in the highest score portfolio and a short position in either the lowest score portfolio or the domestic portfolio: for the raw scores using Terrorism.com counts (Panel A of Exhibit 5), the market risks are smaller by 0.15, the SMB coefficients have larger negative (large-cap) tilts of 0.14, and the HML coefficients have negative (growth-oriented) tilts of 0.29. The magnitudes of these differences among coefficients are smaller using the adjusted exposure scores than using the raw exposure scores. It is difficult to see any differences in inferences between Panels A and B of Exhibit 5.

The most important outcome of this attribution analysis is that the abnormal returns, a_i , are now larger for the highest terrorism score portfolios in almost every experiment. However, once again, there is no precision to this statement as these differences in abnormal returns are statistically indistinguishable from zero. The largest difference in abnormal returns arises in Panel B of Exhibit 5 using raw scores of 0.16% per month (1.97% annualized) between the highest and lowest terrorism score portfolios. Note the differences in tracking error among the terrorism portfolios. Typically, they are larger for the domestic or lowest terrorism score portfolios. For the spread portfolios that might actively seek to capitalize on the differences in terrorism scores, the abnormal returns—already small in magnitude—are overwhelmed by the large tracking error, which ranges between 2.54% and 2.82% on a monthly basis (annualized, 8.79% to 9.77%).

I explore several variations of the performance attribution analysis. Specifically, I provide additional robustness tests using alternative portfolio construction methods, different subperiod analysis, and an alternative model specification. The first two experiments construct spread portfolios based on the highest and lowest terrorism scores using the more-extreme top and bottom deciles (10%) and less-extreme top and bottom triciles (30%). For these tests, I consider only adjusted scores and use only the State Department data. I also report the spread portfolio returns and regressions relative to the domestic portfolio. The basic inferences about the insignificance of the abnormal returns to the spread portfolios do not change from Exhibit 5, although the a_i estimates become negative (−0.14%) with the decile portfolios and are a larger positive (0.28%) with the tricile portfolios compared to those earlier. The finding that the high terrorism score portfolios have lower market risk exposures (negative spread portfolio β_j) and a stronger growth orientation

(negative spread portfolio h_j , coefficients on HML) continue to be robust. There are still no significant differences by size exposure (s_i coefficient) or momentum (m_j). As expected, the level of tracking error associated with the spread portfolio based on more-extreme terrorism exposure scores is higher (4.02% per month for deciles versus 2.34% per month for triciles).

A second experiment repeats the results for the high–low terrorism score spread portfolios (again, based on quintiles), but now for two arbitrary subperiods (1996–2000 and 2001–2004). I explore the possibility of parameter instability over time that might affect the inferences from the performance attribution, although I recognize that even greater imprecision is likely with shorter subperiods. The overall inferences about the insignificance of the abnormal returns again do not change from Exhibit 5. However, the lower market risk exposures appear to be concentrated in the earlier period, while the growth orientation (negative spread portfolio h_j) is significant only in the second period. The tracking error is larger in the first subperiod.

The third robustness experiment I consider is a single-factor market model that allows market risk exposures to vary over time with macroeconomic conditions [Ferson and Schadt (1996) and Lewellen and Nagel (2006)]. In other words, I ask if the market risk exposures for portfolios of stocks with high or low terrorism scores are higher or lower than the average when the economy is growing or slowing, when the U.S. dollar is depreciating or appreciating, and when the yield curve is sloped or flat, and so on.¹⁵ As before, there are no statistically significant differences in abnormal returns between the two portfolios. What is interesting, however, is that there are significant differences in how the market risk exposures of the two portfolios respond to innovations in inflation, default-risk premiums, and especially oil price shocks. Stocks with low terrorism scores experience significant increases in market risk exposure around oil price shocks, but portfolios of stocks with high terrorism scores do not. A number of the companies with high terrorism scores are oil producers in regions with political instability and are naturally hedged against oil price shocks. At least, that is one hypothesis consistent with this result.

What do we know, so far? The performance attribution analysis indicates that there are no differences in abnormal returns for portfolios of stocks with high versus low terrorism exposures. The result is robust to different calculations of terrorism exposure scores, different portfolio

construction methods, different subperiods and even different multi-factor models for benchmarking. There are, however, some interesting differences in terms of systematic risk exposures relative to fundamental factors, in their variation over time, and in terms of tracking error relative to passive investments relative to the market and various known factor portfolios.

TERROR-FREE INVESTING

Terror-free investment portfolios have recently become quite popular. A terror-free portfolio screens out individual holdings of companies that are determined to have operations in countries which have been designated by the U.S. Department of State as state sponsors of terrorism, such as North Korea, Syria, Sudan, and Iran. Over 20 U.S. states, including California, Florida, Ohio, Connecticut, Illinois, and New Jersey, have legislation that has been passed or proposed, or is pending, which mandates that the states' public pension funds must divest any holdings of companies with operations in Iran or Sudan. In this section, I evaluate any risk or return consequences to screening out such holdings. My investment universe is the S&P 500 and I identify the list of stocks that have foreign operations, according to the *Uniworld Directory*, in one of the countries that the Counterterrorism Office of the U.S. Department of State (various reports, 1995–2003) has designated as state sponsors of terrorism.

By year of designation, the countries are Cuba (1982 to present), Iran (1984 to present), Iraq (1990 to 2004, removed in September 2004), Libya (1979 to 2006, rescinded status in May 2006), North Korea (1988 to present), Sudan (1993 to present), and Syria (1979 to present).

The S&P 500 universe is not ideal for this experiment because very few U.S. companies do business in those countries. Independent of my efforts, the U.S. Securities and Exchange Commission compiled a list of companies that they deem are doing business in one of these countries. The SEC list confirms my conclusion that very few U.S. companies are doing business in these countries.¹⁶ Although I identify certain companies that the SEC does not, the companies included on both my and the SEC's list have large market capitalizations and command a sizeable weight in the S&P 500 Index. Many of these companies are well known, including Citigroup, CIGNA, Baker Hughes, Dover, Hilton Hotels, JP Morgan Chase, and Xerox, and many reappear in each year of the sample period.

Exhibit 6 reports the results of a performance attribution analysis for the terror-free portfolio. The horizon is the 132-month period from 1996 to 2006. I compare the regression results with the full, unconstrained S&P 500 portfolio as well as the domestic portfolio, familiar from the analysis reported in Exhibit 5, which includes only those stocks that have no recorded foreign operations,

EXHIBIT 6

Performance Attribution Regressions for Terror-Free Portfolios

	Domestic Portfolio	Full S&P 500	Terror-Free Portfolio	Terror-Free–Domestic	Terror-Free–Full S&P
α_i	0.17%	0.08%	0.06%	–0.11%	–0.02%
β_i (Mkt-Rf)	0.28	0.11	0.26	0.49	0.43
	0.97***	0.97***	0.96***	–0.01	–0.00
s_i (SMB)	0.00	0.00	0.00	0.92	0.52
	–0.14***	–0.20***	–0.18***	–0.05	0.02**
h_i (HML)	0.00	0.00	0.00	0.30	0.03
	0.24***	0.02	0.04**	–0.20***	0.02*
m_i (MOM)	0.00	0.15	0.05	0.00	0.06
	0.01	–0.04***	–0.02***	–0.03	0.02***
R^2	0.83	0.00	0.01	0.29	0.00
	0.84	0.99	0.98	0.14	0.18
s_e	1.71%	0.48%	0.65%	1.77%	0.25%
Mean	0.83%	0.57%	0.57%	–0.25%	0.00%
Std. Dev.	4.24%	4.29%	4.24%	1.87%	0.23%
Skewness	–0.49	–0.55	–0.57	–1.09	0.04
Kurtosis	0.77	0.64	0.56	7.29	2.17

Note: *, **, and *** indicate statistically significant differences at 10%, 5%, and 1%, respectively. The regressions include 132 months (1996–2006).

according to the *Uniworld Directory*. The terror-free portfolio has a similar market risk exposure to that of the S&P 500 and the domestic portfolio (β_i of 0.96 versus 0.97), and the same is true for the coefficients on the momentum (m_i) factor. The only systematic exposures that are significantly different between the terror-free portfolio and the S&P 500 and domestic portfolios are 1) size—for the terror-free portfolio relative to the S&P 500—where its negative coefficient, or large-cap bias, is smaller in absolute terms (s_i is -0.18 compared to -0.20), and 2) value-growth—for the terror-free portfolio relative to the domestic portfolio—where its positive coefficient, or value-bias, is smaller in absolute terms (h_i is 0.04 versus 0.24). The abnormal returns are positive, but statistically indistinguishable from zero and, based on the spread portfolio returns of the terror-free portfolio relative to each of the other benchmarks, statistically indistinguishable from each other. The spread portfolio of the terror-free and S&P 500 portfolios uncovers a small tracking error of 25 bps per month, or 87 bps on an annualized basis, relative to the market and the three other passive investment portfolios.

CONCLUSION

This study evaluates the risks and returns to two different terrorism-related investment strategies in the U.S. markets over the period 1994–2006. The first strategy evaluates a subportfolio of S&P 500 stocks constructed on the basis of a terrorism-related risk score that measures a company's operations in countries with a high incidence of terrorism-related activity. The second strategy evaluates a terror-free subportfolio of S&P 500 stocks in which stocks are screened if they have operations in countries that the U.S. Department of State has designated as state sponsors of terrorism. I find that the terrorism-related risk exposure portfolio would have earned, on average, an economically small and statistically insignificant 16 bps premium per month with a tracking error of 2.8% per month, and that the terror-free portfolio would have earned an even smaller -1.6 bps premium per month with a modest tracking error of 25 bps per month. Return attribution analysis using a multifactor model uncovers interesting differences in systematic exposures to market risks and fundamental factors related to size, market-to-book ratios, and momentum. The results are robust to different subperiods, different portfolio construction methods, and even different multifactor models.

These results contribute importantly to on-going research on terrorism and stock markets because they complement the existing findings of economically significant stock price declines associated with terrorist attacks. The stock market consequences to such events are short term, transitory, and idiosyncratic in nature. Longer-term investment strategies formulated based on the ex ante exposures of stocks to terrorist activity show no statistically or economically significant consequences. The results also contribute to the current public policy debate about the costs of implementing terror-free investing strategies. No economically meaningful differences appear in the risk or return attributes of portfolios of stocks screened on the basis of their foreign operations in countries designated as state sponsors of terrorism.

It is tempting to conclude that terrorism-related investing is much ado about nothing, but cautions abound for such a premature verdict. One concern about my method is that the terrorism exposure scores are constructed with no detailed information about the breadth and scope of a firm's foreign operations in terms of property, plant, and equipment or human capital assets at risk of loss. Some firms may not have assets, nor conduct business directly, in the country, but instead sell their products in such countries through independent non-U.S. distributors. A primary factor in the uncertainty surrounding a firm's extent of foreign operations is that even though the *Uniworld Directory* (my source for information on a firm's location of operations) gives an address of a local office for the U.S. firm in the country of interest, it provides no information about the geographic location of the firm's primary assets, especially in relation to where the primary sources of terrorism activity are located within the country.

Another concern, especially in an assessment of terror-free investing strategies, stems from my exclusive focus on U.S. markets. Very few U.S. firms do business in countries designated as state sponsors of terrorism because the U.S. Department of the Treasury's Office of Foreign Assets Control administers laws and regulations that impose penalties on U.S. citizens and business entities for conducting business in such countries. Whether such laws apply to foreign firms is unclear. In addition, many public and private pension funds and endowments have global investment mandates which include stocks of foreign firms, possibly with significant investment weights, that do business in these designated countries. Broadening the analysis to incorporate a global investment strategy may render different results and conclusions.

ENDNOTES

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¹For more than two decades, scholars in economics, sociology, and political science have been actively researching the patterns in terrorist activity over time and around the world. The earliest studies facilitated the construction of a publicly available chronology of international terrorist events, known as the ITERATE (International Terrorism: Attributes of Terrorist Events) and International Crisis Behavior databases, which were compiled by Mickolus [1980] at the Inter-University Consortium for Political and Social Research at the University of Michigan. Studies that have drawn on these data include, among many others: Hamilton and Hamilton [1983] who built a social contagion model to show open societies have a harder time weakening the tendency of terrorist acts to incite further violence; Cauley and Im [1988] who used intervention analysis to study the effectiveness of different security measures to deter attacks; Enders and Sandler [1993, 2000] who used vector autoregression (VAR) models to uncover a decreasing trend in attacks in the post-Cold War period due to reduced state sponsorship of more preventative measures; and, Krueger and Laitin [2003] and Krueger and Maleckova [2003] who studied potential links among terrorist activity, political oppression, economic growth, and democratic institutions.

²Information about the Conflict Securities Advisory Group is available at www.conflictsecurities.com.

³See "Terror-Free Investing" in the *Wall Street Journal* (December 14, 2006), "Investors Tick the Box and Go 'Terror-Free'" in the *Financial Times* (March 22, 2007), and "Missouri Treasurer's Demand: Terror-Free Pension Funds" in the *Wall Street Journal* (June 14, 2007). The Conflict Securities Advisory Group (CSAG) in conjunction with the Roosevelt Investment Group has created the first terror-free mutual fund, the Anti-Terror Multi-Cap Mutual Fund (Ticker: BULLX).

⁴See "Florida Becomes First State with Law to Divest Pension Funds from Iran, Sudan" in the *International Herald Tribune* (June 8, 2007) and "Should States Sell Stocks to Protest Links to Iran?" in the *Wall Street Journal* (June 14, 2007). Most recently, the U.S. Securities and Exchange Commission (SEC), with the goal of investor protection, created a publicly available web-based link in order to name and expose U.S. and international companies that the SEC has determined have operations in countries designated by the U.S. Department of State as state sponsors of terrorism. See "Outrage over SEC

Terrorism 'Blacklist'" in the *Financial Times* (June 28, 2007) and "Bank Group Says 'Blacklist' Could Curtail US Listings" in the *Financial Times* (July 1, 2007).

⁵This experiment is small in scope, but it is related to the large literature on socially responsible investing. Important contributions have included, among others: Bauer, Koedijk, and Otten [2005]; Statman [2005]; Derwal et al. [2005]; Geczy, Stambaugh, and Levin [2005]; Bollen [forthcoming]; and Renneboog, ter Horst, and Zhang [2007]. The performance-based analysis in this literature is clearly mixed, but two articles are more closely related—Hong and Kacperczyk [2006] provided evidence for the effects of social norms on markets by studying "sin" stocks of companies involved with the production of alcohol, tobacco, and gaming, finding lower institutional investor interest, higher expected returns, and greater litigation risk; and, the earlier study by Teoh, Welch, and Wazzan [1999], who found, by contrast, no effect of the boycott of South Africa's apartheid regime on institutional shareholdings or stock prices.

⁶Uniworld Business Publications has compiled the *Directory of American Firms Operating in Foreign Countries* since 1955. The most recent edition [2005] is an electronic compilation, but the earlier editions are available only in print form. More information is available at www.uniworldbp.com.

⁷A number of studies use these data (e.g., Karolyi and Martell [2007]). Krueger and Laitin [2004] analyzed, in detail, problems with the statistical appendix of the *Patterns of Global Terrorism* report. They pointed to a lack of safeguards and consistent procedures in the data collection, analysis, and dissemination process, with a focus on the 2003 report.

⁸The Terrorism Research Center has an electronically searchable database called the Terrorist Attack Archive which provides the date of an attack, the country in which the attack occurred, and a description of the terrorist incident. The Terrorism Research Center also provides intelligence reports by country and terrorist group, as well as counterterrorism profiles. The Center's website address is www.terrorism.com.

⁹This report is available from Jeff Wurgler at New York University, <http://pages.stern.nyu.edu/~jwurgler/>.

¹⁰In 1998, Alltel was awarded, as part of a consortium with Hughes Electronics and India's Ispat Industries, a \$200 million contract to build wireless telecommunications systems for Bombay and the state of Maharashtra.

¹¹See the December 31, 2006, Sigma Aldrich 10-K/A filing.

¹²The appendix is available from the author by request.

¹³See Banz [1981], Reinganum [1981], Fama and French [1993], and Jegadeesh and Titman [1993], among others.

¹⁴I would like to thank Kenneth French for providing these data from his website at Dartmouth College, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. The Fama-French portfolios are constructed from the intersections of two portfolios formed on size, as measured by market equity (ME), and three portfolios using the ratio of book equity to

market equity (BE/ME) as a proxy for value. Returns from these portfolios are used to construct the Fama-French Factors. See Fama and French [1993] for details.

¹⁵Details on the macroeconomic instruments used and their manner of construction are available upon request.

¹⁶The list compiled by the SEC of U.S. companies doing business in Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria for the respective years can be found at <http://www.sec.gov/edgar/edgartlistfilings.htm>.

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