

INFORMED DECISIONS ON CATASTROPHE RISK

An Economic Analysis of Corporate Demand for Terrorism Insurance in the U.S.

The terrorist attacks of September 11, 2001 triggered \$40 billion in insured losses (2014 prices), then the costliest disaster in the recent history of insurance.

The U.S. Terrorism Risk Insurance Act (TRIA) was established in 2002 as a public-private partnership to make terrorism insurance widely available to corporate America, and has succeeded in doing so.

Renewed in 2005 and 2007, TRIA will expire at the end of 2014 unless extended again by Congress and the President.

If TRIA is extended, the federal government might require insurers to assume more risk, as was the case when TRIA was renewed in 2005 and 2007.

To manage their exposure and growing concerns from rating agencies, insurers are likely to respond to increases in their risk by limiting availability of coverage and/or significantly increasing premiums.

We find that under current market conditions, firms' demand for terrorism insurance is not very sensitive to gradual price changes.

- Before the September 11, 2001 terrorist attacks (9/11), commercial insurance contracts typically included terrorism as an unnamed peril.
- Following 9/11, reinsurers and insurers excluded terrorism from most property coverage contracts.
- The federal government established a dedicated partnership with insurers—TRIA—that provides up to \$100 billion in coverage to corporations doing business in the U.S.
- Firms have the option to purchase terrorism insurance coverage as an endorsement to their property insurance contract.
- It is thus possible to evaluate whether American corporations differ in their demand for property and terrorism insurance, and if so in what ways.
- Using a unique dataset of corporate clients and insurance providers from Marsh & McLennan, we performed the first empirical analysis of demand for terrorism coverage by over 1,800 large firms.
- About 6 out of 10 firms in the sample have some terrorism insurance coverage.
- Larger firms tend to purchase proportionally *less* coverage than smaller firms; they are more diversified and can better self-insure some risk.
- Corporate demand for terrorism insurance is strong as demonstrated by a low price elasticity: a 10% increase in terrorism premium leads to only a 1.3% decrease in terrorism coverage.

Context

Since the 9/11 attacks the Wharton Risk Center has taken a leadership role in providing policymakers and business leaders with evidence-based analysis of the U.S. and foreign terrorism insurance markets, releasing more than 20 studies on the topic to date.

The 2002 Terrorism Risk Insurance Act (TRIA) established a partnership between the federal government and the insurance industry. Insured losses above \$100 million are shared as follows:

- First, insurers assume a deductible, defined as the percentage of their direct earned premiums for all TRIA insurance lines of the previous year. That deductible has increased significantly since the passage of TRIA: it was 1% in 2002, 7% in 2003, 10% in 2004, 15% in 2005, 17.5% in 2006, and 20% since 2007.
- Above the deductible there is an 85%-15% co-pay between the federal government and insurers (increased for insurers from 90%-10% in 2007).
- Any federal compensation paid from the loss sharing above the deductible is to be recouped via a mandatory policyholder surcharge to the extent that aggregate insured losses do not exceed \$27.5 billion, referred to as the insurance marketplace aggregate retention amount. (133% of that federal payment will be collected.) This retention level was \$10 billion in 2002, \$15 billion in 2005; \$25 billion in 2006, and has remained at \$27.5 billion since 2007 – an increase of 175% since 2002.

Unlike basic coverage against natural disasters (e.g., earthquakes, floods, hurricanes) which is provided as part of standard commercial property insurance, firms operating in the U.S. that want terrorism coverage for property, related business interruption and liability loss, need to purchase a dedicated endorsement. (The only exception is workers' compensation insurance where terrorism is automatically included as part of the coverage.) One can thus measure corporate demand for terrorism insurance specifically and compare it with the demand for property coverage, which has been extensively studied.

Hypothesis

Because past terrorist attacks have been very costly and highly publicized events, risk-averse managers are likely to perceive a large-scale terrorist attack as potentially more harmful to their company and to their reputation than other losses covered by property insurance. In addition, the Sarbanes-Oxley Act of 2002 increased the liability of corporate directors, who in turn may urge firms to purchase terrorism insurance. We thus hypothesized that corporate demand for terrorism insurance will be less sensitive to price changes than demand for property coverage.

Data and Methodology

To test this hypothesis empirically, the Wharton Risk Center obtained data from **Marsh & McLennan** on **insurance purchases by 1,808 large U.S. corporations** headquartered across the country (average total insured value of \$1.7 billion; U.S. operations only) and representing 20 industry sectors. The data contain information about the quantity of insurance purchased for the firms' U.S. operations and the premiums paid for two lines of risk – property and terrorism – for 2007. We performed a series of econometric analyses to capture the demand/supply dynamic of the market. Key results, described here and in more detail in the published peer-reviewed study referenced at the end of this Issue Brief, are robust to several specifications.

Findings

1. What proportion of firms have terrorism insurance?

The majority of firms in our sample – 59% – purchased terrorism insurance. Still, more than **4 out of 10 of firms in the sample had no terrorism insurance.** These percentages have remained constant over the period 2006-2013. What will happen to the uninsured firms following a terrorist attack is unclear. If the past is an indication of the future, federal disaster relief will be forthcoming if the attack is large.

2. Does insurance coverage vary with firm size?

We found that **larger firms are more likely to purchase terrorism insurance, but that they purchase proportionally less coverage than smaller firms.** Larger firms are typically more diversified so the likelihood of suffering simultaneous losses on multiple facilities is fairly low. Aside from this study and the recent report of the President's Working Group on Financial Markets published in April this year, little is known about insurance penetration for small businesses, even though they represent a significant portion of the U.S. GDP and private sector employment, and are arguably more vulnerable to shocks.

3. How price sensitive is the demand for terrorism insurance?

We found that demand is not very sensitive to changes in terrorism insurance costs if the price changes are gradual. A **10% increase in terrorism premium leads to only a 1.3% decrease in terrorism coverage purchased.**

4. How does demand by firms for terrorism insurance compare with the demand for property coverage?

We found that the **demand for property insurance is twice as sensitive to price as the demand for terrorism insurance.** Firms that purchase terrorism insurance really want this type of coverage. This might reflect a strong risk aversion of the firms' managers' vis-à-vis terrorism threat and/or specific requirements imposed on these firms.

Congress and the White House need to consider the demand side of the market when discussing the future of terrorism insurance post-2014. At the same time, they also need to consider how the supply side of the market will be affected by changes in TRIA. The Wharton Risk Center is completing a companion study on how alternative designs of TRIA will affect the current exposure of insurers compared to their surplus, a concern of both insurers and rating agencies. In this study we also analyze how losses would be spread across uninsured firms, insurers, policyholders and the federal government under scenarios of conventional and NBCR attacks in four large cities (Chicago, Houston, Los Angeles and New York).

Sources: Michel-Kerjan, E., Raschky, P. & Kunreuther, H. (2014). Corporate Demand for Insurance: New Evidence from the U.S. Terrorism and Property Markets. *Journal of Risk and Insurance*. Online (March 2014): <http://onlinelibrary.wiley.com/doi/10.1111/j.1539-6975.2010.01380.x/pdf>. Michel-Kerjan, E. (2013). Testimony before the US Senate. "*Reauthorizing TRIA: The State of the Terrorism Risk Insurance Market.*" September 23. Partial financial support for this research was provided by Wharton's Managing and Financing Extreme Events project, DHS's Center of Excellence CREATE at the University of Southern California and Monash University.



UNIVERSITY of PENNSYLVANIA
Risk Management and Decision Processes Center
The Wharton School
3730 Walnut Street
500 Jon M. Huntsman Hall
Philadelphia, PA 19104-6340
<http://www.wharton.upenn.edu/riskcenter>

Issue Brief: An Economic Analysis of Corporate Demand for Terrorism Insurance in the U.S.

INFORMED DECISIONS ON CATASTROPHE RISKS issue briefs are published by the Wharton Risk Management and Decision Processes Center of the University of Pennsylvania. For additional information, contact Carol Heller, hellerc@wharton.upenn.edu or 215-898-5688.

© 2014 Wharton Risk Management and Decision Processes Center

About the Wharton Risk Center

Established in 1984, the **Wharton Risk Management and Decision Processes Center** develops and promotes effective corporate and public policies for dealing with catastrophic events including natural disasters, technological hazards, terrorism, pandemics and other crises. The Risk Center research team – over 70 faculty, fellows and doctoral students – investigate how individuals and organizations make choices under conditions of risk and uncertainty under various regulatory and market conditions, and the effectiveness of strategies such as alternative risk financing, incentive systems, insurance, regulation, and public-private collaborations at a national and international scale. The Center actively engages multiple viewpoints, including top representatives from industry, government, international organizations, interest groups and academia. More information is available at <http://www.wharton.upenn.edu/riskcenter>.

About the Authors

Erwann O. Michel-Kerjan (erwannmk@wharton.upenn.edu) is the Executive Director of the Wharton Risk Management and Decision Processes Center and teaches in the graduate and executive programs at the Wharton School. He chairs the OECD Secretary-General Board on Financial Management of Catastrophes. His research and advisory role focuses on how to better manage and finance extreme events and strengthen resilience through business and policy innovation. He has testified several times before the U.S. Congress on TRIA. Author of over 100 publications, his recent books include *The Irrational Economist* (with P. Slovic, 2010), and *At War with the Weather* (with H. Kunreuther, 2011), which received the Kulp-Wright award for the most influential book on risk management.

Paul A. Raschky (paul.raschky@monash.edu) is Senior Lecturer at the Department of Economics at Monash University, Australia. His research interests are in the fields of political economy, environmental economics, insurance economics and development economics with a focus on natural hazards. His work has been published in the *Quarterly Journal of Economics*, *Journal of Public Economics* and *Environmental and Resource Economics*.

Howard Kunreuther (kunreuther@wharton.upenn.edu) is the James G. Dinan Professor; Professor of Decision Sciences and Business and Public Policy at the Wharton School, and Co-Director of the Wharton Risk Management and Decision Processes Center. He has a long-standing interest in ways that society can better manage low-probability, high-consequence events related to technological and natural hazards. He is a Fellow of the American Association for the Advancement of Science, and a Distinguished Fellow of the Society for Risk Analysis, receiving the Society's Distinguished Achievement Award in 2001. Recent books include *Insurance and Behavioral Economics: Improving Decisions in the Most Misunderstood Industry* (with M. Pauly and S. McMorrow, Cambridge University Press, 2013).