Enhancing Post-Disaster Economic Resilience: Public-Private Partnership for Insuring Terrorism

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Introduction
Terrorism risk poses dynamic challenges to our national security as the threat is continuously evolving. Significant efforts have been undertaken to prevent another large-scale attack on U.S. soil since September 11, 2001 (9/11). But if a terrorist organization were to be successful in perpetrating such an attack in the near future, we need to make sure our economy will be sufficiently resilient to deal with the disruption effectively. A critical question is who will pay for the economic consequences of a large terrorist attack. Insurance can play a central role here, as it has for many years (Willis and Al-Shahery, 2014). But the nature of the terrorist threat requires a public-private partnership. The private sector cannot provide insurance protection on its own.

This paper is structured as follows. Sections 1 and 2 discuss the insurability of the terrorism risk and explain why insurers and reinsurers were unconcerned with providing coverage prior to 9/11 but then felt that terrorism was an uninsurable risk after experiencing severe losses from the 9/11 attacks. Section 3 describes how the Terrorism Risk Insurance Act (TRIA), originally passed in 2002 and renewed several times (most recently in January 2015) has created a financial arrangement between the federal government and the private sector so that insurers are willing to market commercial coverage. We perform a series of empirical analyses to clarify who will pay what portion of the loss under the 2015 renewed form of the TRIA program for several plausible attack scenarios across the United States. As we show, insurers will pay all of the insured losses today unless they are truly catastrophic, in which case taxpayers will contribute to the cost.

1. Challenges in Insuring Terrorism

Insurance markets function best when the losses associated with a particular risk are independent of each other and the insurer has accurate information on the annual likelihood of the relevant events occurring and the resulting damage should a disaster occur. By selling a large number of policies for a given a risk and applying the law of large number on independent risks, an insurer should be able to estimate with an acceptable degree of precision the claim payments it expects to make during a given period of time.

To illustrate this point with a simple example, consider an insurer who offers a fire insurance policy to a set of identical homes each valued at $100,000. Based on past data, the insurer estimates that the likelihood that a home will be destroyed by fire next year is 1/1,000 and...
that this is the only loss that can occur. In this case, the expected annual loss for each home would be $100 (i.e., 1/1000 x $100,000). Assume that the risk of a fire to any home is uncorrelated with the risk of fire to any other home (that is, fire is an independent risk). If the insurer issued only one policy to cover the full loss from a fire, then there would be a variance of approximately $100 associated with its expected annual loss.\footnote{The variance for a single loss $L$ with probability $p$ is $Lp(1-p)$. If $L = $100,000 and $p = 1/1,000$, then $Lp(1-p) = $100,000 (1/1,000)(999/1,000), or $99.90.} As the number of policies ($n$) issued increases, the variance of the expected annual loss, or the mean loss per policy, decreases in proportion to $n$. Thus, if $n = 10$, the variance of the mean loss will be approximately $10$. When $n = 100$ the variance decreases to $1$, and with $n = 1,000$ the variance is $0.10$. It is thus not necessary to issue a very large number of policies to significantly reduce the variability of expected annual losses per policy if the risks are independent.

This model of insurance works well for risks such as fire (excluding wildfire) and automobile accidents where the losses are normally independent and there are sufficient data to estimate the risk accurately. Terrorism risk does not satisfy the above conditions, so it is more problematic to insure. Foremost among these characteristics are the high level of uncertainty about the probabilities and potential catastrophic nature of losses (including business interruption), high correlation of risk across entities exposed to loss, and interdependencies, such as would arise if a building that had been damaged by a bomb collapsed on another structure that was not a direct target of the terrorists.

**Dynamic Uncertainty and Time Scale**

Since terrorists are likely to design their strategy as a function of their own resources and their knowledge of the vulnerability of the entity they want to attack, the nature of the risk is continuously evolving. This dynamic uncertainty makes the likelihood of future terrorist events extremely difficult to estimate (Michel-Kerjan, 2003).

More formally, as research conducted by CREATE has shown, the analyst is confronted with a dynamic game where the actions of the terrorist groups are dependent on the actions taken by those threatened by the terrorists. From the terrorists’ point of view, they must determine what targets to attack and the commitment of resources to specific activities. Their decisions will be influenced by the types of protective measures undertaken by those at risk (Richardson et al, 2005).

More specifically, terrorists may respond to security measures by shifting their attention to more vulnerable targets. Keohane and Zeckhauser (2003) analyze the relationships between the actions of potential victims to reduce losses from a terrorist attack and the behavior of terrorists. Establishing observable protective measures against a given mode of attack on a specific building should lead the terrorists to direct their attention elsewhere and hence reduce the probability of an attack against that building. However, shielding that piece of property increases the likelihood of an attack on an unprotected structure.\footnote{One exception would be if terrorist groups attack trophy buildings to prove that they can inflict damage to well-protected structures.}

Rather than investing in additional security measures, firms may prefer to move their operations from large cities to less populated areas to reduce the likelihood of an attack. Of course, terrorists may choose these less protected regions as targets if there is heightened security in the urban areas. Terrorists also may change the nature of their attacks if protective measures in place...
make the likelihood of success of the original option much lower than another course of action (e.g., switching from hijacking to bombing a plane). This substitution effect has to be considered when evaluating the effectiveness of specific policies aimed at curbing terrorism (Bier et al., 2007) and makes it difficult to estimate the risk associated with future attacks and hence the ability to price terrorism insurance.

There are large historical databases on losses from natural hazards that are in the public domain. These data have been utilized by modeling firms in conjunction with estimates by scientists and engineers on the likelihood and consequences of future disasters in specific locations. Data on terrorist groups’ activities and current threats are normally undisclosed for national security reasons. Moreover, while some time-series data on terrorist acts over the past years are in the public domain, they may not reflect the changing planned activities of terrorist groups today. The nature of terrorist organizations, their motives, targets and modus operandi has radically changed in the last 20 years and may do so again over the next 20 years. ³

All of these factors combine to make the likelihood of terrorist attack scenarios on a particular city during a prespecified time period extremely difficult, if not impossible, to estimate. The challenges in estimating the likelihood of an attack has led to insurers’ use of deterministic approaches—“what-if” scenarios—rather than probability-based approaches. A typical scenario, and one that we will examine, is a 10-ton truck bomb exploding in a major metropolitan area. Rating agencies use this scenario to stress test the capacity of insurers to pay claims.

**Potential for Catastrophic Losses**

Another limitation of terrorism risk insurability is the potential for devastating losses to different lines of insurance. The insured losses from 9/11 illustrate the high degree of risk correlation between different lines of insurance coverage. The 9/11 attacks affected commercial property, caused business interruption, and led to significant claims from other lines of coverage: workers’ compensation, life, health, disability and general liability insurance. Over 3,000 people were killed and 2,250 others were injured. The attacks inflicted damage estimated at nearly $80 billion, about $32.4 billion of which was covered by insurance (Hartwig, 2004). Figure 1 depicts the composition of the $32.4 billion total insured loss estimates due to these terrorist attacks.

Attacks using chemical, biological, radiological and nuclear (CBRN) weapons have the potential to inflict large insured losses, especially on workers’ compensation and business interruption lines. The bombing of a chlorine tank in Washington, DC could kill and injure hundreds of thousands of people. Nuclear attacks could have a much more severe impact. Indeed, there is evidence that terrorist groups explored the possibility of obtaining a nuclear device to build “suitcase nuclear bombs” and continue to see value in this form of terrorism (Kunreuther et al., 2014). The other important element is that reinsurers - who are more geographically diversified globally than are primary insurers- paid for about two-thirds of the insured claims of 9/11. This led them to withdraw their coverage against losses from terrorist attacks, leading most insurers to conclude that the terrorism risk was uninsurable.

³ The IRA in the UK in the 1990s was very different than Al Qaeda in the 2000s, which itself is very different than ISIS today. For instance, ISIS has much more financial power than any terrorist organization has ever had (Michel-Kerjan, 2015).
Interdependencies

The vulnerability of one organization, critical economic sector and/or country depends to some extent not only on its own choice of security investments, but also on the actions of other agents. This concept of interdependent security implies that failures of a weak link in a connected system could have devastating impacts on all parts of it, and that as a result there may be suboptimal investment in the individual components (Kunreuther and Heal, 2003; Heal and Kunreuther, 2005). The existence of such interdependencies provides another challenge in determining how much terrorism coverage to offer and what premium to charge.

Interdependencies do not require proximity. In the case of the 9/11 attacks, security failures at Boston's Logan airport led to the tragedies at the World Trade Center (WTC), the Pentagon and in rural Pennsylvania. There was nothing that firms located in the WTC could have done on their own to prevent these aircraft from crashing into the towers.

Except for very specific policies (e.g., contingent business income coverage), terrorism insurance normally does not cover losses unless the insured is the direct target of an attack (Godard et al., 2002). For example, the Federal Aviation Administration’s (FAA) subsequent ban of takeoffs of all civilian aircraft regardless of destination caused business interruption losses to the city of Chicago. In March 2004, the city was denied insurance compensation for losses that resulted from the FAA’s decision. The specific clause of the insurance contract for business interruption specified that it would cover only losses that were the “direct result of a peril not excluded,” thus imposing a limitation that excludes interdependent effects due to the response to an attack (U.S. District Court, 2004).

2. Decision Processes of Insurers Regarding Terrorism Insurance

A large body of cognitive psychology and behavioral decision research over the past 30 years has revealed that individuals and organizations often make decisions by combining intuitive thinking with deliberative thinking. In his thought-provoking book, Thinking, Fast and Slow, Nobel Laureate Daniel Kahneman has characterized the differences between these two modes of
thinking. *Intuitive thinking* operates automatically and quickly with little or no effort and no voluntary control. It is often guided by emotional reactions and simple rules of thumb that have been acquired by personal experience. *Deliberative thinking* allocates attention to effortful and intentional mental activities where individuals undertake trade-offs, recognize relevant interdependencies and the need for coordination (Kahneman, 2011).

Choices are normally made by combining these two modes of thinking and generally result in good decisions when individuals have considerable past experience as a basis for their actions. However, with respect to low-probability high-consequence events such as terrorism, there is a tendency to either ignore a potential disaster or overreact to a recent one. More specifically, individuals often exhibit systematic biases such as the *availability heuristic*, where the judged likelihood of an event depends on its salience and memorability (Tversky and Kahneman, 1973). There is thus a tendency to ignore rare risks until after a catastrophic event occurs.

**Role of Ambiguity on Insurer Behavior**

Only after 9/11 did the insurance industry seriously look at its exposure to future losses. Most insurers determined that they could not offer terrorism insurance because the uncertainties surrounding the likelihood and consequences of another terrorist attack were so significant. Those who offered coverage charged extremely high premiums; their behavior is consistent with empirical studies on how underwriters and actuaries would price coverage when they faced risks with ambiguous probabilities and uncertain losses relative to a well-specified risk.

A recent web-based experiment provided actuaries and underwriters in insurance companies with scenarios in which they seek advice and request probability forecasts from different groups of experts and then must determine what price to charge for coverage for flood damage and wind damage from hurricanes. The average premium that insurers would charge was approximately 30% higher for coverage against either of these risks if the probability of damage was ambiguous rather than well-specified and if the experts were conflicted over their estimates. The data reveal that they would likely charge more in the case of conflict ambiguity (that is, experts disagree on point estimates) than imprecise ambiguity (that is, experts agree on a range of probabilities, recognizing that they cannot estimate the probability of the event precisely) (Cabantous et al., 2011).

**Impact of Availability Bias on Insurer Behavior**

Prior to September 11, 2001 terrorism exclusions in commercial property and casualty policies in the U.S. insurance market were extremely rare because losses from terrorism had historically been small and, to a large degree, uncorrelated. Attacks of domestic origin were isolated, carried out by groups or individuals with disparate agendas. Thus the country did not face a concerted domestic terrorism threat, as did countries such as France, Israel, Spain and the UK. (Kunreuther and Michel-Kerjan, 2004).

In fact, insurance losses from terrorism were viewed as so improbable that the risk was not explicitly mentioned nor priced in any standard policy and it was never excluded from so-called “all-risk” policies with the exception of some marine cargo, aviation and political risk policies. Even the first attack on the World Trade Center (WTC) in 1993 that killed 6 people and caused $725 million in insured damages, and the Oklahoma City bombing of 1995 that killed 168 people...
but had no insured property losses since the building was self-insured, were not seen as being threatening to insurers. Neither disaster led them to revise their view of terrorism as a peril worth considering when pricing a commercial insurance policy. The insurers viewed the likelihood of a major terrorism loss as below their threshold level of concern so they did not feel the need to consider the risk separately when pricing coverage for commercial insurance prior to 9/11 (Kunreuther, Pauly and McMorrow, 2013).

As mentioned above, reinsurers (most of them European) were responsible for a large portion of the claims from 9/11. Coming on top of a series of catastrophic natural disasters over the previous decade and portfolio losses due to stock market declines, their capital base was severely decreased. Furthermore, reinsurers’ appetite for new capital to provide coverage against terrorism risk was sharply curtailed. The few who marketed policies charged extremely high rates for very limited protection. This directly affected insurance supply. Most insurers stopped covering terrorism in areas they perceived to be high risk unless they were forced to include it in their policies, as with workers’ compensation. When coverage was offered, the prices were likely to increase significantly over what they were prior to 9/11 and coverage limits were reduced.

Take the case of insuring Chicago’s O’Hare airport. Prior to 9/11, the airport had $750 million of terrorism insurance coverage at an annual premium of $125,000. After the terrorist attacks, insurers offered the airport only $150 million of coverage at an annual premium of $6.9 million. The airport was forced to purchase this coverage in order to operate (Jaffee and Russell, 2003). Golden Gate Park in San Francisco, CA was unable to obtain terrorism coverage and its non-terrorism coverage was reduced from $125 million to $25 million. Yet the premiums for this reduced amount of protection increased from $500,000 in 2001 to $1.1 million in 2002 (Smetters, 2004).

3. The Terrorism Risk Insurance Act (TRIA)

Given the retrenchment of the insurance and reinsurance markets for terrorism coverage and the demand by commercial enterprises for terrorism coverage to meet lending requirements or protect against the potential for future losses, the Terrorism Risk Insurance Act (TRIA) was passed in 2002 to stabilize the U.S. economy by establishing a public-private risk-sharing arrangement between the federal government, the insurance industry and commercial policyholders.

First, TRIA instituted a mandatory offer requirement whereby all U.S. primary insurance companies had to offer coverage against terrorism risk for specified commercial lines of insurance on the same terms and conditions as other perils provided by their commercial insurance policies. Firms are not required to purchase this coverage unless mandated by state law, as is normally the case for workers’ compensation insurance. At the same time, TRIA established a risk-sharing mechanism between the insurance industry, the federal government and all commercial insurance policyholders in the U.S. for covering insured losses from future terrorist attacks.

The Act was extended in 2005 for two years, in 2007 for seven years and in January 2015 for another six years, with an increasing portion of the losses from a terrorist attack covered by the insurance industry and commercial policyholders each time the legislation was renewed.

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4 Testimony of Jacques Dubois, Chairman and CEO Swiss Re America on behalf of Swiss Re before the United States Senate on Banking, Housing, and Urban Affairs, May 18, 2004.
5 This section draws on Kunreuther et al., 2014.
**Structure of the new TRIA partnership**

Under TRIA’s 2015 renewed design, losses from events certified as terrorism by the federal government and resulting in over $200 million in insured losses in TRIA-eligible lines of business would be shared as follows.

- Commercial policyholders are responsible for paying any losses within their standard insurance policy deductibles.

- Commercial insurance companies then provide coverage for all losses in excess of these policy deductibles, provided that total insurance industry losses did not exceed $100 billion (often referred to as the TRIA “program cap”).

- The federal government reinsures the commercial insurer’s terrorism losses in excess of a TRIA deductible percent \(D^*\), with the deductible reset annually so that it equals 20% of that insurer’s prior year direct earned premium (DEP) for the lines covered under the program. \(D^*\) has increased from 1% in 2002 to 20% since 2007 and has remained at that level when the program was renewed in 2015.

- Losses in excess of each insurer’s deductible \(D\) would be shared 20%-80% between the insurance company and the federal government.

- Should total insurance industry losses exceed $100 billion, primary insurers are responsible for reimbursing policyholders only for their proportionate share of losses up to $100 billion and Congress shall determine the procedure and source of any payments for the uninsured losses.

- After an insured event occurs, the federal government recoups part or all of its payments under TRIA by levying surcharges on all commercially insured policyholders in subsequent years. More specifically, under a mandatory recoupment mechanism, the federal government is required to recoup 144% of its payments below the insurance industry marketplace aggregate retention (“retention”) – set at $27.5 billion in 2015 and that will gradually be increased to $37.5 billion by 2020– and above the aggregate insurers’ uncompensated outlays (i.e., insurer losses within the deductible and coinsurance) during the calendar year. In the event that uncompensated insurer outlays across the insurance industry exceed that industry retention level, the U.S. Treasury has the option to recoup any and all federal payments through a discretionary recoupment mechanism.

Figure 2.a depicts the public-private loss sharing for a representative insurer covering terrorism for its commercial policyholders (either through workers’ compensation or property insurance) under the current TRIA arrangement when total insured losses are less than $100 billion. If a terrorism loss incurred by an insurance company \(i\) is less than its TRIA deductible amount \(D_i\), as determined as a percentage of its prior year Direct Earned Premium (DEP) in TRIA-eligible lines, the insurer does not receive any reimbursement from the federal government. This situation is illustrated by an insured loss of \(L_i\) where the insurer’s payment is represented by the oblique lines on the left side of Figure 2.a.

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\(^6\) The 133% was driven by the budget scoring of the 2007 extension of TRIA to make the legislation budget neutral within the 10-year windows used to score the legislation.
When the insured loss from a certified terrorist attack exceeds the program trigger and is above the insurer’s deductible, as depicted by $L$ in Figure 2.a, the insurer pays the entire claim and the federal government reimburses the insurer for 80% of the losses above its deductible. Hence, the insurer ends up paying 20%. The horizontal lines on the right side of the figure represent the federal payment. $D_i$ plays an important role in determining loss sharing between insurers and the federal government and can amount to very large sums for many insurers. Should a terrorist attack occur in 2015, insurers will be responsible for losses equal to 20% of their DEP in 2014.

If the entire insurance industry suffers terrorism losses on their U.S. portfolio that requires the government to cover a portion of their claims, then these outlays shall be fully or partially recouped ex post, as described above. Insurers levy this surcharge against all commercial property and casualty policyholders, whether or not they had purchased terrorism insurance, and transfer the collected funds to Treasury.

Figure 2.b depicts loss sharing under the new TRIA legislation (assuming here the loss-sharing arrangement at the end of the renewal period, 2020) between all the insurers whose policyholders suffer an insured terrorist attack (the area depicted by oblique lines), all commercial policyholders (solid area) and the taxpayers (the area depicted by horizontal lines) after the federal government has reimbursed all insurers for 80% of their claims payments above their individual TRIA deductible level.

In the example considered here, since the total insured loss $L$ for the entire insurance industry is greater than $37.5$ billion but total losses retained by insurers within their deductibles and coinsurance requirements are below the market aggregate retention, a portion of the federal outlays are subject to the mandatory recoupment. Should the federal government elect to exercise its authority to levy a discretionary recoupment surcharge against commercial policyholders to fund federal outlays not covered by the mandatory recoupment mechanism, there would be a 1-for-1 reallocation of loss from taxpayers to commercial policyholders.
**Estimating Losses from Terrorist Attack Scenarios**

As discussed above, given the challenges in modeling terrorism risk, the focus of attention by insurers has been on the outcomes of deterministic scenarios on potential losses, such as the consequences of an explosion of a 10-ton truck bomb in an urban area. Insurers and reinsurers pay careful attention to their aggregate exposure to risk in relation to their current policyholder surplus. How the exposure is diversified geographically and across industries also plays a key role. For example, a $1 billion exposure in a given city should not be viewed as equal to an exposure of $100 million in each of 10 different cities. Even though there is a reluctance to utilize explicit probabilities in estimating terrorism risks, insurers are concerned about the possibility that their losses will exceed a prespecified level.

In constructing terrorist scenarios, damage is a function of the attack type and building type. The type of attack, whether package, car or truck bomb, can be expressed as a TNT-equivalent. The size of this charge can be thought of as the intensity of the event. Damage to the target building results from the resulting shock wave, the subsequent pressure wave, and fire. The target building may sustain total damage from the point of view of insured loss even if it remains standing. If the building collapses, however, it will increase the number of fatalities. Furthermore, different modes of collapse, such as an overturn versus a pancake collapse, will affect the degree of damage to surrounding buildings and thus the total area affected by the event. The buildings surrounding the target building are also likely to be damaged by the resulting shock and pressure waves and/or by falling or flying debris.

In our recent report, *TRIA after 2014*, (Kunreuther et al 2014) we analyze loss-sharing using three attack scenarios in four major cities using the terrorism model of the modeling firm Risk Management Solutions (RMS). The three scenarios reflect different modes of attacks: a) 10-ton truck bomb; b) 1-ton Sarin chemical agent release and c) a 1-kiloton nuclear weapon. For each of the three attack modes, key high-profile targets were identified in the central business districts of Chicago, Houston, Los Angeles and New York. The RMS models estimated property losses from commercial insurance, and casualty losses arising from workers’ compensation coverage (Kunreuther et al., 2014).

Since terrorism cannot be excluded from workers’ compensation insurance and must be purchased by commercial enterprises, a 100% take-up rate for terrorism-related workers’ compensation losses is assumed. There are no available data on terrorism coverage for all commercial firms operating in the U.S., but insurance brokers Marsh & McLennan (2013) and Aon (2013) have both published terrorism insurance take-up rates for their clients. This level has remained stable over the past 5 years ranging from a low of 40% in the chemical industry to a high of 80% in the media industry (Marsh, 2013). The analysis that follows assumes a 50% take-up rate for terrorism insurance for the property lines, recognizing that the actual percentage may vary from one city to another as well by the type of firm.

Building on the range of possible terrorist attack scenarios, Table 1 details how changing the size of the loss from $5 billion to $100 billion affects the distribution of payments in one specific metropolitan area (New York, NY) under the new TRIA loss sharing arrangements. The other damage scenarios are extrapolated from the loss ranges using the RMS models.
Table 1: Impact of varying terrorism attack losses under new TRIA loss sharing arrangements: Illustration with New York City (in billion dollars)

<table>
<thead>
<tr>
<th>Loss</th>
<th>Property</th>
<th>Workers Comp.</th>
<th>Non-Insured</th>
<th>Total Insured</th>
<th>Insurers</th>
<th>Commercial Policyholders</th>
<th>Federal Taxpayers</th>
</tr>
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<td>$5.00</td>
<td>$3.00</td>
<td>$2.00</td>
<td>$1.50</td>
<td>$3.50</td>
<td>$3.14</td>
<td>$0.48</td>
<td>$0.00</td>
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<td>$9.00</td>
<td>$6.00</td>
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<td>$5.77</td>
<td>$31.07</td>
</tr>
</tbody>
</table>

Consider a $5 billion loss, with $3 billion for property damage and business interruption and $2 billion workers’ compensation with 50% of the property damage being uninsured (i.e., $1.5 billion uninsured). As shown in Table 1, insurers would cover $3.14 billion—or 90% of the total insured losses. The rest will be recouped by the federal government against all commercial policyholders, whether they are insured against terrorism or not. In this scenario and others shown in Table 1, the taxpayers will not pay anything for the losses. For a severe $50 billion loss, insurers would pay $23.04 billion—or 66% of the total insured losses. Commercial policyholders will pay the remaining 34% of the insured losses. An important question is whether the uninsured firms will be able to cover their losses. In a recent study, we show that larger firms are more likely to purchase terrorism insurance. The uninsured smaller firms may have more difficulty recovering from a terrorist attack than the larger ones given their financial constraints (Michel-Kerjan, Raschky and Kunreuther, forthcoming).

The amounts paid by the relevant stakeholders as a function of losses to New York City from terrorist attacks are depicted in Figure 3. The two vertical lines in these figures represent the projected $25 billion loss from a Sarin attack and the $32 billion from a 10-ton truck bomb attack. Several findings are worth noting:

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Note that under TRIA, the federal government recoups 133% of its payments from the commercial policyholders.
Figure 3: Amount Paid by Stakeholders for Different Losses from Terrorist Attacks to New York City under the New TRIA Legislation (with a $37.5 bn industry retention)

- The federal government will not be responsible for any payments until the total insured losses from a terrorist attack exceed $59 billion.
- When total insured and non-insured losses reach $100 billion, insurers will ultimately be responsible for approximately $33 billion in payments, insurers almost $31 billion, the commercial policyholders over $5.7 billion. The remaining $30 billion would be uninsured.
- Commercial policyholders will always pay more than $10 billion when total losses from terrorist attacks in New York City are in the $38 billion to $82 billion range. The maximum they would pay – $17.9 billion – is reached when losses are $54 billion.

4. Conclusion

The private-public partnership between the insurance industry and the federal government through the passage of TRIA recognizes the need for addressing the two major concerns that insurers have with respect to providing protection against extreme events: the uncertainty in estimating the probability of catastrophic events occurring, and the magnitude of the resulting losses that can reduce their firms’ surplus significantly.

In the case of terrorism, insurers address this problem by constructing deterministic scenarios that reveal their impact on potential losses if they offer coverage to all of their customers. Based on the current TRIA legislation it is feasible for any insurer to determine what their own losses are likely to be from terrorist attacks of different magnitudes in any part of the country by constructing tables and figures similar to those provides in the previous section. In this way, insurers can determine their ability to cover these losses with their current surplus as a function of
their risk portfolio. They can then determine how much coverage they want to provide to commercial firms in a particular region to reduce the likelihood of suffering an extremely large loss to an acceptable level. Insurers have to determine what premiums to charge their clients for terrorism coverage, which requires them to estimate the likelihood of different losses occurring (see Kunreuther et al., 2014 for a more detailed analysis).

TRIA has made terrorism an insurable risk by protecting insurers against a catastrophic event through a loss sharing arrangement where the federal government provides financial assistance if insurance industry claims exceed a certain level, and recoups some or all of their payments over time rather than immediately after the event to protect insurers’ financial position. Because they pay these claims without charging the insurers a premium for this reinsurance coverage there is no need for the government to estimate the likelihood of these catastrophic events occurring and provides legitimation for recouping 144% of their federal payments via the mandatory recoupment provision in TRIA.

Before TRIA was renewed there was considerable discussion in Congress with several hearings as to whether the program, launched as a temporary partnership, should indeed be renewed. Some argued that providing free reinsurance to insurers who provided coverage and collected premiums was a gift to these firms in the industry: any recoupment from the federal government would not be against insurers, but against all firms that had a commercial insurance policy, whether or not they had terrorism coverage. Another point raised in favor of not renewing TRIA was that the private market was exposed to a large risk under the current program and this implied that they could handle this risk without a federal backstop.

Those favoring the renewal of TRIA contended that the program had worked relatively well since the taxpayers had not been asked to contribute anything and that firms had access to affordable terrorism insurance. It was not clear either that not renewing TRIA would actually result in less exposure to the American taxpayers. As one of us stated during his testimony before the US Congress, “If TRIA expires, and unless reinsurers reentered the U.S. market with much more capacity than they provide today and at a price considered reasonable by insurers, most primary carriers are going to exclude this risk from their portfolio everywhere they can. Those that provide it will charge much higher premiums than they currently do to take into account expensive capital they need to set aside to meet regulatory and/or rating agencies’ requirements. Under extreme pressure from the media and interest groups, the federal government will be asked to step in. If the attack occurs during an election year, this would be even more certain.” (Michel-Kerjan, 2012).

The tension was clear when Congress failed to renew TRIA at the end of 2014. (Kunreuther and Michel-Kerjan, 2014). For a few weeks America was uncovered again. Then TRIA was renewed later in January 2015.

One open question remains, even with TRIA in place: how will this program pass the test of a real large-scale attack? The way the federal government and the insurers (and their reinsurers) will react to a terrorist attack on U.S. soil will depend on its size. Should an attack inflict minor economic losses, as was the case in the 2013 Boston Marathon bombing, the insurance market is not likely to be affected. However, another large-scale attack such as 9/11, or more frequent small-scale attacks, may cause a further retrenchment by insurers with restrictions in capacity and coverage especially in the absence of a TRIA program. One of the reasons terrorism insurance prices have decreased in recent years can be explained by the absence of any significant attack, competitive pressure on general insurance rates, and concerted efforts by insurers over the past
decade to bring their exposures into line with existing TRIA parameters (Michel-Kerjan, 2013; GAO, 2014).

Finally, in analyzing each of the terrorism attack scenarios, we have focused solely on the insurable losses under the scenario and not the broader economic losses that would have to be addressed. To the extent that an attack causes business interruption for uninsured firm and other indirect impacts, one needs to consider the role that insurance and other protective measures undertaken by firms can play in cushioning these longer term economic effects.
REFERENCES

AON Benfield (2013). Response to the U.S. Treasury and the Presidential Working Group: Terrorism (Re)insurance.”


