

The Federal Government as Insurer of Last Resort for Terrorism Risk

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Lawmakers recently reauthorized the federal program that provides insurance against the risk of terrorism. That program addresses the inherent difficulty of pricing rare, catastrophic risks; after a large attack, it would reduce demands for assistance and help stabilize the economy. It may also crowd out private reinsurance and dampen mitigation incentives. The Congressional Budget Office estimates that the program yields expected net budgetary savings, provided that the post-attack taxes—which would generally exceed federal outlays—are imposed on commercial policyholders as specified in current law. However, the government bears the risk of catastrophic losses and of ex post policy changes.

Keywords: accrual accounting, federal budgeting, terrorism insurance

INTRODUCTION

Lawmakers recently reauthorized the federal program that provides insurance against the risk of terrorism through December 31, 2027 (P.L. 116-94, Further Consolidated Appropriations Act, 2020). Under the program, private insurers bear much of the risk of losses from terrorist attacks through sizeable deductibles and then through copayments above the deductible. The government acts as reinsurer and pays the remainder of the losses; however, the law requires the government to recoup most of those outlays through post-event taxes (“assessments”) on all commercial policyholders. Thus, taxpayers are effectively left bearing only the catastrophic or “tail” risk—roughly, the risk of losses greater than those experienced from the September 11, 2001 attacks.

Federal involvement in the market for terrorism risk insurance can be viewed as addressing a market imperfection—the inherent difficulty of pricing very rare, catastrophic risks—that would otherwise reduce the supply of the insurance below the optimal level. In effect, the federal government acts as the insurer of last resort by stepping in to fill gaps in private insurance coverage. The program is arguably a component of homeland security, one that focuses not on preventing attacks but on spreading the risk and costs of such attacks more broadly, by increasing the inclusion of terrorism coverage in business and commercial policies (including workers’ compensation policies). In turn, that coverage encourages continued commercial construction in major urban areas, helping preserve socially beneficial “agglomeration economies” associated with geographic concentrations of related businesses, but also increasing possible losses from a terrorist event.

The budgetary impact of the program is heavily influenced by the provisions of the law that, in most cases, require that the tax assessment be set to recoup 140 percent of all or most federal outlays:

- For attacks resulting in losses less than a specified “aggregate industry retention amount,” all federal outlays are subject to recoupment.
- For larger attacks, federal outlays subject to recoupment are limited to the positive difference between the retention amount and insurer contributions from deductibles and copayments. The government is not required to recoup any outlays from attacks large enough to yield insurer deductibles and copayments that exceed the retention amount.

Relying on post-event assessments rather than upfront premiums has three potential disadvantages:

- It reduces opportunities for private reinsurers and capital-market participants to provide coverage.
- It may reduce efficient actions by policyholders to lessen or mitigate their risks, although the great uncertainties surrounding the likelihood of terrorist attacks and the effectiveness of mitigation efforts make it unclear whether accurate premiums could be charged or how much risk reduction would occur.
- Although post-event assessments are also used in lieu of upfront premiums in some other federal insurance programs, the mechanism has not yet been tested in the terrorism context, and policy changes after a major attack could significantly increase federal costs.

This paper reports on work by the Congressional Budget Office (CBO) to analyze the program and its likely effects on both the federal government and the private sector (CBO, 2015, 2019c, and 2019d, and Torregrosa, et.al, 2015). The following sections discuss the program’s origins, the arguments for and against federal involvement in terrorism insurance, details of the program’s structure, CBO’s estimates of the program’s costs on both a cash and an accrual basis (taking into account the great uncertainty about the probabilities of attacks of different sizes), and the program’s effects on insurance markets and the broader economy.

ORIGIN OF FEDERAL REINSURANCE FOR TERRORISM RISK

The September 11, 2001, terrorist attacks resulted in nearly 3,000 deaths and roughly \$49 billion of insured losses (in 2020 dollars). Property and casualty insurers initially covered the largest share of the insured losses from the 9/11 attacks, including damages to commercial buildings, motor vehicles, and business equipment, and losses of personal income and business income. (Losses of personal income were addressed through workers’ compensation insurance, which provides wage replacement and medical benefits to employees who are injured on the job, as well as death benefits to survivors of workers who die in a work-related accident.) Global reinsurance companies—private firms that agree to share portions of the risks in policies generated by other insurers in return for premiums—ultimately covered the majority of the losses.

Before 9/11, insurers generally covered losses from terrorist attacks using conventional weapons but did not evaluate or separately charge for that risk, implicitly treating it as if it were negligible.¹ Afterward, reinsurers virtually stopped writing new contracts, shifting all the catastrophic risk back to primary insurers. In turn, primary insurers sharply reduced the availability of terrorism coverage for businesses and commercial properties. Temporary disruptions in insurance markets, including abrupt reductions in supply and changes in terms of coverage, are common after large and unexpected losses, such as those from natural catastrophes. Those effects typically diminish over time as insurers adjust their prices to account for changes to the perceived risks (Froot, 2008). But in light of the unexpected and unprecedented losses from the attacks, as well as the heightened uncertainty surrounding future losses, policymakers were concerned that the market for terrorism insurance would not recover sufficiently, with the result that commercial developers in high-risk areas would not be able to finance their projects, in turn causing reductions in new construction, job creation, and economic growth.

In response, lawmakers enacted the Terrorism Risk Insurance Act (TRIA) in 2002 as a temporary measure to provide catastrophic federal reinsurance for terrorism risks. Because the market disruption was expected to be short-lived, TRIA was set to expire at the end of calendar year 2005, and federal

reinsurance was offered without charge.² Although no major terrorist attacks have occurred in the United States since 9/11 and thus the government has paid no claims, the threat of terrorist attacks persists, and lawmakers reauthorized TRIA in 2005, 2007, 2015 (after a short lapse), and again in 2019. The reauthorizations gradually shifted more risk to private insurers as their ability to bear terrorism risk increased and as models to quantify the risk became more widely used.

Beyond passing TRIA, the federal response to the 9/11 attacks also included significant spending, in various forms. The government initially provided supplemental disaster assistance of between \$35 billion and \$46 billion (in 2019 dollars), depending on which outlays are assumed to be in response to the attacks, for compensation to families of the victims and to aid New York City's economic and physical redevelopment (CBO, 2005). Lawmakers subsequently increased the funding available to cover illnesses and deaths that the first responders and others suffered years later due to toxic exposures. In 2019, CBO estimated that the September 11th Victim Compensation Fund Act will result in \$10.2 billion of additional spending between 2019 and 2029 (CBO, 2019a).

ARGUMENTS FOR AND AGAINST FEDERAL INSURANCE FOR TERRORISM RISK

Most insurance and reinsurance in the United States is provided by the private sector. In the case of insurance for terrorism risk, however, limited information may lead insurers to overestimate that risk, in which case they may set premiums very high, ration coverage, or not offer coverage at all (CBO, 2002). In addition, terrorism insurance coverage may have spillover benefits not taken into account by potential policyholders. Those market imperfections potentially create a role for the federal government to act as the insurer of last resort.³ But federal intervention to address such gaps and increase risk-sharing might have the unintended consequence of increasing the losses from terrorist attacks.

Several arguments support a federal role:

- In the absence of government intervention, incomplete information about terrorism risk would result in too little risk-sharing—in particular, underinvestment in some projects that would be socially beneficial and potentially significant gaps in coverage after future attacks.
- The risk of terrorism reduces the desirability of locating businesses or other commercial enterprises in high-profile, landmark buildings in general and in high-risk areas such as New York City and Washington, D.C., in particular (Glaeser and Shapiro, 2002 and Abadie and Dermisi, 2006). Shifting economic activity away from major urban centers could compromise the agglomeration economies that arise when businesses conduct their activities in areas with heavy clusters of related businesses. Those agglomeration economies reflect the rapid diffusion of knowledge and information that results in a dense grouping of related businesses.⁴ Federal insurance subsidies that reflect the extent of such spillover benefits could improve economic efficiency.
- The increase in insurance coverage could reduce the need for federal assistance following an attack. Many analysts view insurance as a more effective and equitable way of dealing with losses than federal disaster relief.
- Because acts of terrorism are directed at the country as a whole, not specifically at the owners and users of particular facilities targeted for their patriotic or iconic value, federal subsidies that distribute some of the cost of terrorism risk to taxpayers as a whole may be seen as fair.

The disadvantages of a federal insurance program for terrorism risk arise largely from the negative effects of subsidies.⁵ Subsidies are not inherent in federal insurance—policymakers could choose to eliminate or minimize them—but they are common in such programs. In this case, the subsidies arise because the federal government provides coverage without charge.

- By reducing the premiums charged for terrorism insurance, especially for policy holders with high-risk properties, TRIA dampens incentives for insured businesses to mitigate risks—for example, by relocating activities to areas of lower perceived risk or by spending more on safety features.⁶ The size of any effect TRIA's subsidies are having on future losses from terrorism

depends on two factors, both of which are unknown: the effectiveness of investments to mitigate terrorism risk and the extent to which the subsidies are affecting decisions on those investments. Policy holders carrying subsidized terrorism coverage will take some mitigation measures nonetheless, as illustrated by the enhanced safety features included by the developers of the new Freedom Tower at One World Trade Center (Skidmore, Owings, and Merrill, 2005).

- The government's role reduces opportunities for private reinsurers and participants in capital markets, who cannot compete effectively against federal coverage that is available to insurers at no cost, and leaves taxpayers bearing most of the catastrophic risk.
- By reducing the cost of insurance in higher-risk areas and thus preserving the benefits of agglomeration economies, the subsidies also preserve the concentration of attractive targets, and potentially increase the losses of a future terrorist attack.

AN OVERVIEW OF THE FEDERAL TERRORISM RISK INSURANCE PROGRAM

TRIA requires all property and casualty insurers to offer terrorism coverage to their commercial policyholders. (Property and casualty insurance covers businesses against losses from property damage, workers' compensation claims, business interruption, and most liability claims.) The federal government provides reinsurance to private insurers by agreeing to reimburse them for a portion of their terrorism-related losses of up to \$100 billion on commercial policies after an event certified by the Secretary of the Treasury as a major terrorist attack and causing insured losses above the program's trigger, which reached \$200 million in 2020. Losses above \$100 billion would be uninsured.

Under TRIA, all types of losses from terrorist events are covered unless such losses are excluded by the underlying property and casualty policies. Nuclear, biological, chemical, and radiological (NBCR) risks are typically excluded from property and casualty policies because they are difficult to estimate and potentially much larger than conventional risks (such as large truck bombs). The important exception to that exclusion is workers' compensation policies: Almost all states require employers to purchase coverage for workers' compensation and require insurers to cover losses from all causes, including NBCR attacks. Many policies also exclude cyber risks, such as those associated with deliberate interruptions of computer systems, payment systems, and power grids, because of the potential for large losses, ambiguity about policy terms related to coverage, changing and hard to estimate risks, and uncertainty surrounding the certification of potential attacks (Evan, 2016, Geneva Association, 2018, and Granato and Polacek, 2019).⁷

TRIA lessens the risk of losses to primary insurers by shifting responsibility for some insured losses to all commercial property and casualty policyholders and, in some cases, to the federal government. Insurers pay no premiums for TRIA coverage but bear some of the risk of losses through an initial deductible—currently defined as 20 percent of each insurer's prior year premiums for all insurance lines covered by TRIA—and then through a 20 percent copayment above the deductible (the government pays the remainder). The shifting of risk to commercial property and casualty policyholders occurs via a tax that the government may be required to impose on such policyholders, including those without terrorism insurance, to recoup some or all of its outlays after an attack. Under current law, the private sector is responsible for all losses below an "aggregate retention amount"; based on data from industry experts, CBO estimated that the retention amount for 2020 is \$44 billion.⁸ To the extent that losses below the retention amount are not covered by insurer deductibles and copayments, the government imposes the tax on policyholders, with the tax rate set so as to yield 140 percent of all federal outlays by September 30, 2029.⁹ For attacks causing losses greater than the retention amount, the government may be required to impose a tax to recoup 140 percent of some portion of its outlays, as illustrated below.

Federal precedents for post-event assessments can be found in two programs:

- The Orderly Liquidation Fund, established by the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, which relies on post-event assessments on banks to recover the budgetary costs of resolving failures of systemically important financial institutions; and

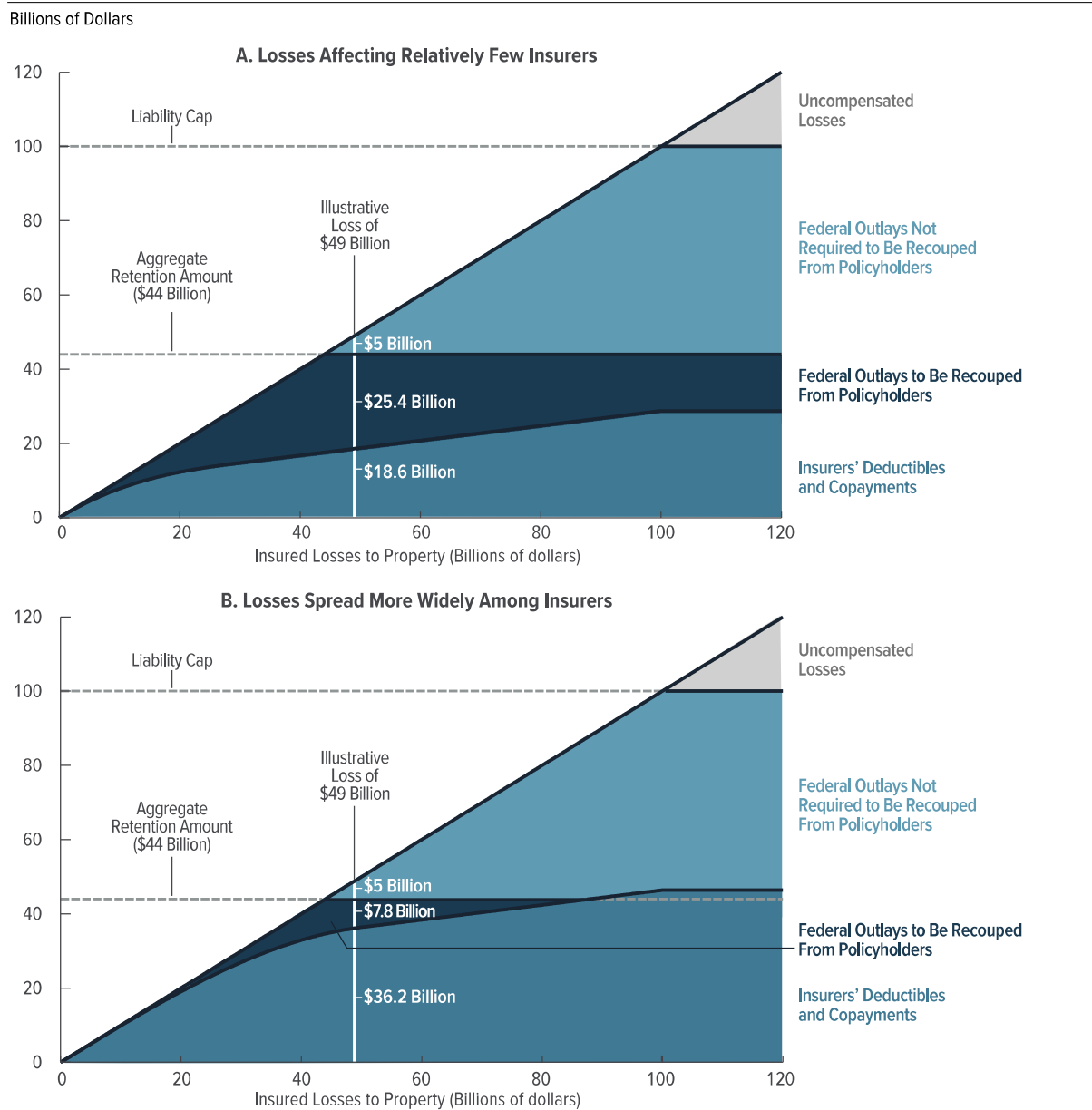
- The Price-Anderson Nuclear Industries Indemnity Act of 1957, under which nuclear reactor operators could face assessments to recoup some of the losses in the event of a nuclear accident.

No assessments have been collected under those two laws. However, assessments on property and casualty insurers have been collected by many state guaranty funds, which cover some of the claims of insolvent insurers.

CBO analyzed H.R. 4634 The Terrorism Risk Insurance Program Reauthorization Act of 2019, which extends the program for seven years through December 31, 2027 without other substantial changes in the program's provisions (CBO, 2019c and 2019d). Increases over time in the dollar amount of insurers' deductibles and the aggregate retention amount, driven by increases in insurance premiums, will gradually shift slightly more risk to insurers and policyholders. CBO estimated that, over the 10 years from 2020 to 2029, extending TRIA would result in net deficit reduction of \$1.25 billion. (Some claims would not be settled by 2029; the additional spending after that date significantly lowers the total deficit reduction.) CBO's estimates are cash measures (as discussed below) and were prepared using the May 2019 baseline.

The budgetary effects of TRIA's various risk-sharing provisions as they apply in 2020 are illustrated in Figure 1. The two panels of the figure show the allocations of losses under two scenarios involving different groups of insurers and different proportional distributions of losses among those insurers. Either panel in Figure 1 can be used to identify the allocation of losses for any size of attack for which its specified scenario about the affected insurers and the distribution of the losses applies. In general, however, scenarios like the one shown in Panel A, involving smaller groups of insurers, would be more likely to apply to smaller attacks. Conversely, larger attacks would probably involve larger groups of insurers, such as the group represented in Panel B.

FIGURE 1
ALLOCATION OF POTENTIAL INSURED LOSSES FROM TERRORISM IN 2020 UNDER
TWO EXPOSURE SCENARIOS



Source: Congressional Budget Office.

After a terrorist attack, the amount paid by insurers in deductibles and copayments would depend on the total insured losses, the total deductibles of the affected insurers, and how the losses were distributed among those insurers. Panel A shows allocations of losses for an illustrative set of insurers that have collective deductibles of \$11 billion and would all meet their deductibles if the total insured losses were \$30 billion or more. Panel B shows allocations of losses for a larger set of insurers that have collective deductibles of \$33 billion and would all meet their deductibles if insured losses were \$50 billion or more. Both panels reflect the 20 percent copayment rate and the \$44 billion aggregate retention amount (which helps determine the amount of federal outlays that must be recouped from policyholders) in effect in 2020. (They also reflect an assumption that each individual insurer is small and thus that the curves representing total insurers' deductibles and copayments are smooth. Because of that smoothness, the curves in the two panels appear to become linear, at slopes of 20 percent, for losses of less than \$30 billion and \$50 billion, respectively; however, they remain very slightly curved below those thresholds.)

For the scenario depicted in Panel A, the losses would be spread rather unevenly among a group of insurers that have collective deductibles of \$11 billion (one-fourth of the estimated \$44 billion retention for all insurers). Specifically, given the distribution pattern of the losses among the insurers, only attacks that caused losses of \$30 billion or more would result in all insurers reaching their deductibles.¹⁰ To illustrate the scenario, a hypothetical attack that caused \$49 billion in insured losses (making it roughly as costly as the September 11 attacks) is shown as a dashed line in Figure 1. With such an attack, \$18.6 billion of the insured losses would be covered by insurers' deductibles and copayments; of the remaining \$30.4 billion covered by federal outlays, the Treasury would be required to recoup \$25.4 billion. Recoupment of the remaining \$5 billion would be at the discretion of the Secretary of the Treasury, but it seems unlikely that the Secretary would use that authority in the aftermath of a large attack.¹¹

By contrast, Panel B in Figure 1 shows loss allocations under a scenario in which losses were spread among insurers with total deductibles of \$33 billion and were distributed somewhat more proportionately, so that the \$33 billion would be reached if total insured losses were \$50 billion or more.¹² Under that scenario, for an attack that caused \$49 billion in insured losses, insurers' deductibles and copayments would cover \$36.2 billion and federal outlays would cover \$12.8 billion. The Treasury would be required to recoup about \$7.8 billion but not the remaining \$5 billion.

CBO'S BASELINE PROJECTIONS OF TRIA'S FEDERAL COSTS

CBO would estimate the budgetary effects of any future changes to the terrorism insurance program in relation to its baseline projections for the program.¹³ The March 2020 baseline (prepared before significant effects of the 2020 coronavirus pandemic became evident) incorporates the effects of TRIA's reauthorization as well as the program's effects for most of calendar year 2020.¹⁴ CBO estimated that over the 2020 to 2030 period, TRIA would increase federal spending by \$7.1 billion and boost net revenues by \$8.5 billion through taxes in the form of surcharges imposed on policyholders, resulting in a net deficit reduction of \$1.5 billion (see Table 1). Although CBO estimated that the program would result in net savings on an expected-value basis, in the unlikely event of attacks bigger than those of September 11, 2001, the program could result in significant net federal costs.

TABLE 1
CBO'S MARCH 2020 BASELINE BUDGET PROJECTIONS FOR THE FEDERAL
TERRORISM RISK INSURANCE PROGRAM, 2020 TO 2030

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Total	
												2020–2025	2020–2030
Outlays ^a	70	290	500	650	770	850	910	960	930	680	440	3,130	7,050
Revenues													
Tax assessments	0	230	650	1,300	2,100	390	750	1,250	2,030	2,430	0	4,670	11,140
Offset ^b	0	-50	-140	-280	-460	-90	-180	-310	-500	-600	0	-1,030	-2,610
Net revenues	0	180	500	1,010	1,640	300	570	950	1,540	1,830	0	3,630	8,520
Net Change in Deficit	70	110	0	-360	-870	550	340	10	-610	-1,150	440	-500	-1,470

Source: Congressional Budget Office.

Years in this table are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end. Values may not add up to totals because of rounding.

a. Estimates exclude \$2 million annually for administrative expenses. Projected outlays between 2031 and 2037 (not shown in the table) total \$730 million.

b. CBO and the staff of the Joint Committee on Taxation project that payment of taxes for recoupment would lower income in the private sector and, in turn, reduce income and payroll tax revenues. When the Terrorism Risk Insurance Act was reauthorized in 2015, the size of that reduction was about 25 percent, varying slightly from year to year; because tax rates have since dropped, the offset for 2020 is about 22 percent. It is projected to rise to nearly 25 percent by 2026.

CBO's projections of TRIA's costs are cash measures, rather than accrual measures. In a 2018 study, CBO concluded that accrual measures, which accelerate the recognition of long-term costs and offsetting income, might be helpful in conveying information about the costs of the terrorism risk program (CBO, 2018c). Under the March 2020 baseline, the total savings would be lower using accrual measures because savings in future years would be less highly valued, reflecting the time value of money, and because an additional \$730 million that CBO projected would be spent to settle claims after 2030 would be taken into account. The estimates presented here do not reflect the cost of market risk—financial risk that cannot be eliminated by diversifying a portfolio because it arises from shifts in macroeconomic condition (such as productivity and unemployment) or expectations about future macroeconomic conditions. The potential effects on CBO's projections of taking market risk into account are discussed below.

Methodology

Estimating TRIA's budgetary effects is challenging, both because the risk of attacks of different sizes is uncertain and because the program involves several "trigger" threshold values. Those values include the individual deductibles for each insurance company, which equal 20 percent of their prior-year premiums for the covered property and casualty lines of insurance; the aggregate retention amount for the industry as a whole, which CBO estimated at \$44 billion for 2020; and the \$100 billion liability cap. Such threshold values, which are known as "one-sided bets" because they affect budgetary costs on only one side of the threshold, result in a complex relationship between the insured losses from a terrorist attack and the resulting budgetary effects (CBO, 1999).

Given that complexity, CBO's analyses of the TRIA program must take into account the likelihood and cost implications of the full range of potential insured losses. Because the limited number of successful attacks in the United States does not provide an adequate basis for estimating the probabilities of future losses of different sizes, CBO turns to risk modelers and security experts for their perspectives on those probabilities. Using their input, CBO made the following choices when creating the models used to construct its March 2020 baseline: The expected loss in covered lines of insurance in 2019 was approximately \$2 billion, the annual chance that there will be no terrorist attack with damages meeting TRIA's \$200 million threshold is about 60 percent, and the annual chance of an event with losses at least as large as those from the 9/11 attacks is 1 in 750.¹⁵ On the basis of those choices, CBO calibrated a log-normal probability distribution; the log-normal form was chosen because it allows for distributions with the key characteristic that small losses are much more likely than large losses.

Additional modeling choices were required by the individual deductibles for each company (representing separate one-sided bets on each one's losses), which make the budgetary effects dependent not only on the total amount of insured losses, but also on the distribution of those losses among the insurers. CBO created two distribution scenarios and averaged the results: a narrow distribution, encompassing a set of insurers whose collective deductibles are 0.5 percent of the total for all insurers; and a broader distribution, encompassing a set of insurers with 30 percent of the total industry deductible.¹⁶ In both cases, CBO modeled the distribution of losses among the affected insurers in proportion to their market shares.¹⁷

Effect on Spending

In its March 2020 baseline, CBO projected direct spending for TRIA of \$7.8 billion on an expected-value basis—that is, taking into account the estimated probabilities of losses of all sizes—of which \$7.1 billion will occur within the 2020–2030 period. That projection reflected views of some commercial catastrophe modelers that expected losses from terrorist attacks have fallen since the program's previous reauthorization. CBO estimated that expected losses from attacks covered under TRIA, most of which would be covered by insurers' deductibles and copayments, would be about \$2.1 billion in 2020, and would rise each year with projected growth in the economy.¹⁸

Effect on Revenues

CBO's estimate of \$8.5 billion in net revenues over the 2020-2030 period reflected both the provisions of the law—specifically, the requirement for a tax to yield 140 percent of certain outlays by September 30, 2029—and the effect of reduced revenues from policyholders' share of income and payroll taxes. In some cases, the revenues must be collected earlier: for example, revenues associated with an attack occurring by the end of 2022 are to be collected by September 30, 2024. (CBO assumed that the Secretary would not seek to recover financial assistance provided above the retention amount and would not collect interest on outstanding amounts.) Taking both factors into account, net revenues would slightly exceed actual outlays when insured losses were less than, or not too much greater than, the aggregate retention amount.¹⁹ Because attacks causing losses much greater than the retention amount are thought to be far less likely than smaller attacks, the overall expected effect on the budget is a reduction in the deficit.

CBO based its estimate on current law as written, consistent with the agency's general practice of expecting that those charged with implementing laws will attempt to adhere to specified schedules and deadlines. However, the recoupment mechanism has yet to be tested, and after a very large attack, policymakers might be hesitant to collect the required amount of taxes from commercial policyholders, including those without terrorism insurance, by the specified deadline of September 30, 2029, especially if the economy is weak.²⁰ If lawmakers decided to delay, reduce, or eliminate those surcharges rather than risk further weakening insurers and their policyholders after a major attack, then the program could have net budgetary costs, at least over the 10-year period. Thus, CBO's projections were sensitive to the specified recoupment scaling factor and pace of recoupment.

ACCRUAL ESTIMATES OF TRIA'S COSTS

Some federal insurance programs, including deposit, pension, and terrorism insurance, have effects on the budget that extend years or decades beyond the standard 10-year budget window, and policymakers need complete and accurate measures of those effects to make informed decisions about such programs (Congressional Budget Office, 2018c). However, the cash-based measures used for most programs in the federal budget process generally focus only on a 10-year period.

Accrual-based measures can provide more complete information about federal insurance programs in such cases. An accrual estimate summarizes in a single number, called the present value, the net budgetary impact that is anticipated at a particular time from a commitment that will affect federal cash flows many years into the future. The present value of those future cash flows is obtained by discounting them to reflect the time value of money. Accrual estimates prepared following the approach specified in the Federal Credit Reform Act (FCRA) use interest rates on Treasury securities as the discount rates. Alternative accrual estimates known as fair-value estimates, discussed below, typically use higher discount rates to reflect the compensation required by market participants for investments that pose undiversifiable risk (that is, risk that applies to the entire economy).

Advantages and Disadvantages of Accrual Estimates

Accrual measures offer several advantages over cash measures for estimating the budgetary effects of federal insurance programs:

- They avoid mixing the costs of new and existing insurance commitments, as cash measures do. By highlighting the net long-term costs of new commitments when those costs are most controllable, accrual estimates could call policymakers' attention to risk when setting premiums and reserve requirements for programs that insure against unlikely but potentially large losses, and could help identify whether a program's costs are rising or falling over time.
- They can more readily incorporate market risk (described below).
- They make it harder for policymakers to affect estimates of the budget deficit by shifting the timing of payments or receipts without actually changing the inflation-adjusted value of those cash flows.

Accrual measures also have several disadvantages, however:

- They are less transparent and verifiable than cash measures because they are more methodologically complex.
- They require judgments about appropriate methodology that could spark disagreements among analysts and policymakers, such as what time horizon to cover and whether a federal commitment of future resources is firm enough to record those cash flows before they occur.
- They have a wider range of uncertainty and are more subject to change than cash-based estimates.
- Moving from cash to accrual measures in the budget would widen the difference that generally exists between the reported budget deficit and the actual change in outstanding federal debt in a given year. Such a move would also complicate budget reporting.

FCRA Approach

Using the accrual measures prescribed under FCRA, CBO estimates that the savings attributable to one full year’s worth of reinsurance commitments would average \$70 million. That amount reflects the difference between the present value of the federal payments for losses incurred in a given year and the present value of the net revenues from the taxes imposed by the government to recoup its costs for those losses. Over the 2020–2030 budget window, the program would produce total savings of about \$800 million on an accrual basis, CBO estimates, compared with \$1.5 billion of savings projected on a cash basis (see Table 2). That difference between the cash and accrual measures of net savings is mostly attributable to the estimated outlays of \$730 million to settle claims after 2030.

**TABLE 2
CASH AND ACCRUAL ESTIMATES OF THE BUDGETRY EFFECTS OF THE FEDERAL
TERRORISM RISK INSURANCE PROGRAM, 2020 TO 2030**

Millions of Dollars												Total	
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2020– 2025	2020– 2030
Cash Estimates													
Outlays ^a	70	290	500	650	770	850	910	960	930	680	440	3,130	7,050
Net revenues	0	180	500	1,010	1,640	300	570	950	1,540	1,830	0	3,630	8,520
Net Change in Deficit	70	110	0	-360	-870	550	340	10	-610	-1,150	440	-500	-1,470
Accrual Estimates^b													
Outlays	570	780	810	840	870	900	930	970	240	n.a.	n.a.	4,770	6,910
Net revenues	640	890	930	930	940	970	1,020	1,080	280	n.a.	n.a.	5,300	7,680
Net Change in Deficit	-70	-110	-120	-90	-70	-70	-90	-110	-40	n.a.	n.a.	-530	-770

Source: Congressional Budget Office.

Years in this table are federal fiscal years, which run from October 1 to September 30 and are designated by the calendar year in which they end.

Under current law, the program will end on December 31, 2027, which means it will operate through the first quarter of fiscal year 2028.

n.a. = not applicable.

a. Estimates exclude \$2 million annually for administrative expenses. Projected outlays between 2031 and 2037 (not shown in the table) total \$730 million.

b. The accrual estimates are present values of newly incurred costs, discounted using interest rates on Treasury securities, without adjustments for market risk. (A present value expresses a flow of current and future income or payments in terms of an equivalent lump sum received or paid today; the value depends on the rate of interest, known as the discount rate, that is used to translate future cash flows into current dollars.)

Fair-Value Approach

Because large terrorist attacks could disrupt the economy and lower the value of assets, including stocks, TRIA exposes the government—and, by extension, taxpayers—to market risk (Congressional

Budget Office, 2018c). Estimates that reflect the market value of governmental obligations, including the effects of market risk on that value, are known as fair-value estimates.²¹ Such estimates reflect the fact that private investors require additional compensation, called the risk premium, for taking on market risk. In practice, the adjustment for market risk is made by using a discount rate greater than the interest rate on Treasury securities.²² Determining the discount rate that private investors would use introduces an element of judgment not required in the FCRA approach.

Compared with estimates made on a FCRA basis, fair-value estimates of both TRIA's outlays and revenues would be higher. CBO has not developed such estimates to determine the net effect.

TRIA'S EFFECTS ON INSURANCE MARKETS AND THE ECONOMY

TRIA enhances the availability and affordability of terrorism insurance (Torregrosa, et. al., 2015, Webel, 2019, and GAO, 2019). Even without the program, most insurers would probably offer terrorism coverage, at least for conventional terrorism risks, lest they lose business on other property and casualty lines. But the supply of terrorism insurance would be smaller (some property owners would find their choice of insurers reduced or eliminated) and prices would be higher. In particular, prices might be more sensitive to policyholders' risk levels and mitigation measures (as evaluated by insurers), as they are in the United Kingdom.

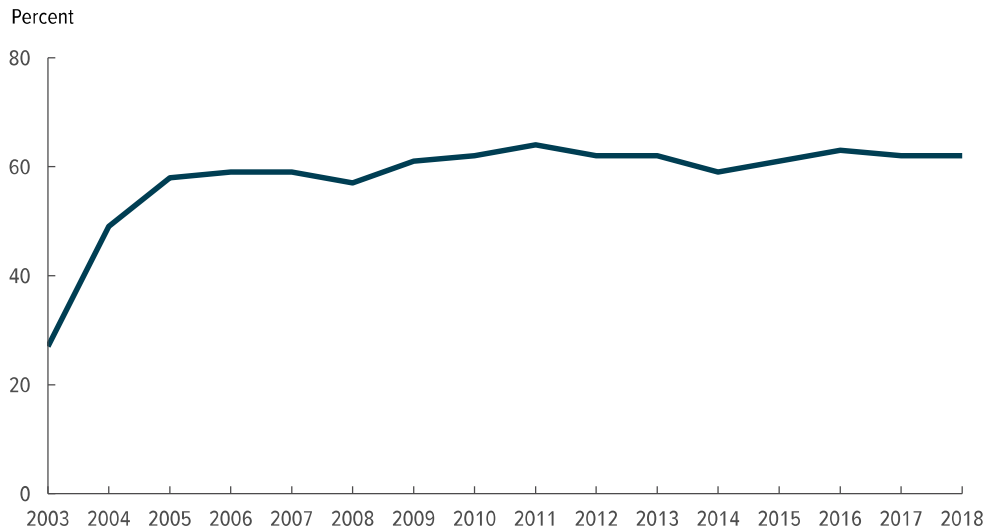
As required under TRIA, private insurers have been bearing more of the risk over time as deductibles and copayments have risen—from 7 percent of premiums and 10 percent of losses respectively, to 20 percent in both cases today—but rates have been fairly stable since 2015 (after falling initially). For properties carrying terrorism coverage, the share of the relevant property and casualty premiums paid for that coverage is generally between 2 percent and 3 percent, though considerably higher in cities such as New York, Washington, D.C., and Chicago, and for iconic buildings (Federal Insurance Office, 2018, p. 22).²³

Multiple factors help explain the stability of prices, including reduced perceptions of terrorism risks and a growing supply of insurance in general. Property and casualty insurers' reported capital—their excess of assets over liabilities, also called “policyholders' surplus”—was \$740 billion at the end of 2018, almost double the \$400 billion (2018 dollars) reported in 2002. (Not all of the additional capital is available to pay terrorism claims; the capital must cover all property and casualty risks.) In addition, private reinsurance is more readily available: With over \$400 billion in capital globally, and somewhat increased confidence in their ability to model and price risks from attacks using conventional weapons given the experience since the 9/11 attacks, reinsurers are willing to bear more conventional terrorism risk.²⁴

In part because of price stability, take-up rates have also been relatively stable.²⁵ Insurance brokers, whose clients are primarily large and medium-size businesses, reported that for the past 10 years, about 60 percent of their customers included such coverage in their purchases of property and casualty insurance (see Figure 2). Not surprisingly, those take-up rates are generally significantly higher in major metropolitan areas (Marsh 2019, pp. 8 and 11).²⁶

The broader economic effects of TRIA to date are unclear. In the aftermath of the September 11 attacks, TRIA may have helped speed the recovery in the New York City area by facilitating insurance for new construction and business operations in general.²⁷ However, those benefits were temporary—the economy would have recovered in any case, perhaps with some shifting of economic activity to areas less vulnerable to attack.²⁸ Economic benefits in more recent years have probably been small, in part because no successful attack occurred and the market for terrorism insurance would have functioned even without TRIA.²⁹ Had a successful attack occurred, however, the benefits to the economy could have been much larger, depending on the magnitude of the losses.

FIGURE 2
FIRMS WHOSE PROPERTY INSURANCE COVERS LOSSES FROM TERRORISM



Source: Congressional Budget Office based on data from Marsh Risk Management Research.

The data are from Marsh's surveys of their clients, which are mainly large- and medium-size businesses.

The data do not include coverage for workers' compensation, which is nearly 100 percent because of state regulation.

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ENDNOTES

1. In contrast, losses from attacks involving nuclear, biological, chemical, and radiological weapons were excluded from coverage under most lines of insurance other than workers' compensation (Kunreuther, et. al., 2013).
2. TRIA's backers originally reasoned that the process of formulating prices would slow the program's implementation and necessitate a new bureaucracy to administer the premiums, which could also eventually encumber efforts to terminate it (CBO, 2007).
3. In the absence of widely available private flood insurance, due to insurers' fear of catastrophic losses, the federal government stepped in to provide such coverage; also, some state governments provide coverage against hurricanes or earthquakes in high-risk areas (Kunreuther, 2015).
4. For example, New York has long been a center of finance, business management, and business services, in part because its density facilitates face-to-face meeting and the immediate exchange of new ideas while offering proximity to large pools of qualified workers (Glaeser, 2005).
5. Other aspects of current federal involvement in terrorism insurance entail fewer disadvantages because they impinge less on the markets for property and casualty insurance (as regulated by the states). For example, although TRIA requires insurers who sell commercial property and casualty policies to offer terrorism coverage in conjunction with those policies (as was already required by New York State and California), it does not restrict the premiums that insurers charge for that coverage.

6. In contrast, Pool Re, the United Kingdom's mutual reinsurance pool for terrorism risks, charges premiums and offers discounts up to 7.5 percent of premiums for mitigation measures.
7. Some analysts have proposed a federal program to insure against cyber risks that could be classified as acts of war, which are typically excluded from private coverage (Klein and Anderson, 2019).
8. In 2020, the aggregate retention amount is the sum of the average of each insurer's deductibles over the previous three years.
9. Under Congressional scoring rules, budget estimates reduce the net revenue from the recoupments by a specified percentage to account for lower income and payroll tax receipts (CBO, 2009). When TRIA was reauthorized in 2015, that reduction was 25 percent; because tax rates have since dropped, the offset for 2020 is 22 percent. Setting the tax to yield 140 percent of the outlays being recouped counterbalances the offset and provides some additional compensation to the government for bearing risk.
10. An equivalent way to specify the scenario is to say that 11:30 is the lowest ratio of an insurer's share of losses to its market share among the set of affected insurers (which determines its share of the collective \$11 billion deductible). For example, one insurer might have 1.5 percent of the group's total market share, but only 0.55 percent of the losses. The deductible of such an insurer would be \$165 million (1.5 percent of \$30 billion) and would be met on a collective loss of \$30 billion or more (because 0.55 percent of \$30 billion is \$165 million). For simplicity, the scenario also reflects the assumption that the group of affected insurers comprises a large number of small firms, implying a smooth trajectory of insurers' contributions as the amount of insured losses increases from zero to \$30 billion and more insurers switch from paying deductibles to 20 percent copayments. Assuming a rougher trajectory would not significantly affect CBO's analysis.
11. The \$18.6 billion paid by insurers includes their collective deductibles of \$11 billion (which are all met because the total insured loss exceeds \$30 billion) and copayments of \$7.6 billion (the 20 percent copayment rate times the \$38 billion of losses above the deductibles).
12. An equivalent description of the distribution is that the lowest ratio of an affected insurer's share of losses to its market share is 33:50. For example, an insurer might have 1.5 percent of the group's market share, corresponding to an individual deductible of \$495 million, but 0.99 percent of the losses. That insurer would meet its deductible on a collective loss of \$50 billion.
13. The baseline is an estimate of spending, revenues, the deficit or surplus, and the public debt expected during a fiscal year that reflects the assumption that current laws will generally remain unchanged. The baseline is a benchmark for measuring the budgetary effects of proposed changes in revenues and spending. It incorporates the assumption that, in general, receipts and mandatory spending will continue or expire in the future as required by law.
14. The baseline projections were prepared before significant effects of the COVID-19 pandemic became evident.
15. Because of a computational error, the annual probability of losses as large as those from 9/11 used in generating the baseline was 35 percent smaller than intended. (That error had only a modest effect on the resulting estimates of outlays, revenues, and deficits over the 2020–2030 period.)
16. Those percentages correspond to the market shares of the insurer with the 30th-largest share and to the combined share of the top 30 insurers.
17. With losses distributed proportionately, all affected insurers meet their deductibles for losses above the same loss threshold (for 2020, the figures in the two cases are \$0.2 billion and \$13.8 billion, respectively) and no federal outlays occur for losses below that threshold.
18. This estimate adjusts for the coverage rates of commercial properties. If all firms purchased coverage for conventional attacks, expected losses would be about \$500 million higher.
19. For losses that exceeded the retention amount, the share of federal payments subject to the recoupment requirement would depend on the size of the loss and the combined market share of the insurers incurring losses. The larger that share, the greater the total deductibles insurers would have to pay before any federal outlays occur.
20. Alternatively, the budgetary costs of outlays from a terrorist attack could be spread more broadly through some combination of increases in general tax revenues and reductions in government spending. Those alternatives would result in the program having a budgetary cost.
21. The fair value of an asset is the price that would be paid for that asset in an orderly transaction (one that occurs under competitive market conditions between willing participants and does not involve forced liquidation or a distress sale). For an analysis of market risk and how it can be incorporated into cost estimates and baseline budget projections, see (Congressional Budget Office, 2018b and Elmendorf, 2014).

22. For a technical discussion of discounting for federal loan guarantees, which are similar in some respects to federal insurance, see (Congressional Budget Office, 2004, pp. 23–24).
23. Other surveys showed somewhat higher rates up to 5 percent (Marsh Risk Management Research, 2019, p. 105).
24. Estimates of reinsurers' capital (as well as alternative capital from insurance-linked securities like catastrophe bonds) differ, but they agree on the upward trend over time despite a small decline in 2018. Aon reported \$496 billion of traditional capital and \$99 billion from alternative capital at the end of 2018 (Aon, 2019), while Guy Carpenter reported \$346 billion of reinsurance capital and \$92 billion of alternative capital (Guy Carpenter, 2019).
25. In addition, corporate demand for terrorism coverage, like demand for general property coverage, appears to be fairly insensitive to price. Studies have found that a 10 percent decrease in price would increase terrorism coverage by between 3 percent and 7 percent and general property coverage by 4 percent to 8 percent (Michel-Kerjan, et. al., 2015).
26. Treasury's survey shows higher take-up rates by policy count but similar rates when expressed as a share of earned premiums (Federal Insurance Office, 2018).
27. For an analysis that covers a range of terrorist attacks, most of which were not catastrophic, see Brodeur 2018.
28. Slower reconstruction is not likely to have a significant effect on the economy from a national perspective, because nonresidential fixed investment in structures represents a small share of gross domestic product (2.9 percent in 2019) and commercial office and health care construction's share is even smaller (0.9 percent in 2019).
29. TRIA has helped reduce the size of the residual (or involuntary) market for workers' compensation insurance, which was particularly unstable after the September 11 attacks. Policyholders in that market tend to have higher risks, and the premiums charged are below market rates (Dworsky and Dixon, 2014).

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