



January 2017

TERRORISM RISK INSURANCE

Market Challenges May Exist for Current Structure and Alternative Approaches

Accessible Version

GAO Highlights

Highlights of [GAO-17-62](#), a report to congressional committees

Why GAO Did This Study

After the terrorist attacks of September 11, 2001, insurers generally stopped covering terrorism risk because losses could be too high relative to the premiums they could charge. Congress enacted TRIA to share losses from a certified act of terrorism between insurers and the government, address market disruptions, and help ensure widespread availability and affordability of terrorism coverage. TRIA does not include an up-front federal charge for the government's share of potential losses. The act mandates that, when private industry's losses are below a certain amount, the federal government recoups some or all of the federal share of losses through policyholder surcharges.

The Terrorism Risk Insurance Program Reauthorization Act of 2015 includes a provision for GAO to review alternative funding approaches for TRIA. Among other things, this report examines (1) how insurers manage their terrorism exposure and federal recoupment of losses, (2) how alternative funding approaches could be designed and implemented, and (3) the potential effects of these approaches as well as the current structure. To assess these funding approaches, GAO reviewed related studies, analyzed several terrorism loss scenarios for each funding approach to estimate potential effects on market participants, and interviewed industry participants.

Treasury and NAIC provided technical comments on a draft of this report, which GAO incorporated as appropriate. GAO also incorporated technical comments received from selected third parties, as appropriate.

View [GAO-17-62](#). For more information, contact Daniel Garcia-Diaz at (202) 512-8678 or garciadiazd@gao.gov.

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What GAO Found

Under the Terrorism Risk Insurance Act's (TRIA) current structure, insurers manage their terrorism exposure to cover their share of losses and not the federal share of losses, which may be recouped from policyholders after an event. Specifically, insurers do not assume the risk of the federal share of potential losses and, thus, do not consider the potential federal share of losses in how they manage their terrorism risk exposure and price coverage. Many insurers include a nominal charge for terrorism risk coverage, if they charge for it at all. Most insurers manage their exposure by limiting the amount of coverage they provide in certain geographic areas. Under the current structure, in some scenarios federal losses must be recouped through premium surcharges on policyholders with TRIA-eligible insurance coverage after a certified terrorism event. However, depending on the size of the terrorism event and the aggregate premiums of affected insurers, the federal government may not be required to recoup all of its losses. To date, no terrorism events have been certified under TRIA.

Designing and implementing alternatives to TRIA's current funding structure, such as a federal terrorism risk insurance charge or set-aside of insurer funds, would require trade-offs among various policy goals and involve complexities. For example,

Federal charge. A charge on insurers or policyholders could either (1) be a risk-based charge intended to help pay for the federal share of potential losses, replacing the current recoupment structure, or (2) be a charge, or fee, paid to the Treasury for the promise of payment of the federal share of losses with recoupment in place to cover the actual losses. A federal charge could help cover potential losses, but determining a price based on risk would be difficult.

Terrorism set-asides. An insurer set-aside to explicitly address terrorism exposure through liabilities, capital, or assets could be designed as (1) loss reserves for future terrorism losses, (2) separate or additional capital requirements for terrorism risk, or (3) separate assets that only could be used for terrorism losses. A set-aside of insurer funds could help cover insurers' potential losses but some approaches would be complex to implement due to implications related to current accounting practices and state laws.

TRIA's current recoupment structure and some alternative approaches could increase prices for policyholders and have various effects on market participants and the federal government. GAO's analysis indicated that the current structure and some alternative approaches could affect the price of coverage and policyholder decisions to purchase terrorism coverage. In addition, one set-aside approach could restrict the flexibility with which insurers can use assets (generally, for a variety of risks) and thus hamper risk management. Under each option, federal fiscal exposure exists. For example, a charge to cover the federal share of losses may be insufficient to cover losses in the near term. However, the design of an alternative approach can, in part, mitigate the magnitude of these effects. For example, lengthening recoupment time frames, charging a broad group of policyholders, or allowing flexibility in applying a set-aside could help mitigate the effects.

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Abbreviations

FASB	Financial Accounting Standards Board
GAAP	generally accepted accounting principles
Marsh	Marsh and McLennan Companies, Inc.
NAIC	National Association of Insurance Commissioners
NBCR	nuclear, biological, chemical, or radiological weapons
NCCI	National Council on Compensation Insurance
PAYGO	pay-as-you-go
SAP	statutory accounting principles
Treasury	Department of the Treasury
TRIA	Terrorism Risk Insurance Act of 2002 and its reauthorizations
TRIM	Terrorism Risk Insurance Modernization Act of 2014

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January 12, 2017

Chairman Committee on Banking, Housing, and Urban Affairs United States Senate

Ranking Member Committee on Banking, Housing, and Urban Affairs United States Senate

Chairman Committee on Financial Services House of Representatives

Ranking Member Committee on Financial Services House of Representatives

The terrorist attacks of September 11, 2001, which resulted in reported total insured losses of roughly \$44 billion (2015 dollars), drastically changed the way insurers viewed the risk of terrorism.¹ After September 11, insurers generally stopped covering terrorism risk because they determined that the risk of loss was unacceptably high relative to the premiums they could charge. In November 2002, Congress enacted the Terrorism Risk Insurance Act of 2002 (TRIA) to help ensure the continued availability and affordability of commercial property/casualty insurance for terrorism risk and to address concerns that the lack of terrorism insurance could have significant effects on the economy.²

TRIA requires the Department of the Treasury (Treasury) to administer a program in which the federal government would share some of the losses

¹Insurance Information Institute, accessed on September 21, 2016, http://www.iii.org/facts_statistics/terrorism.html.

²Pub. L. No. 107-297, 116 Stat. 2322 (2002). TRIA was reauthorized in 2005, 2007, and 2015. See Terrorism Risk Insurance Extension Act of 2005, Pub. L. No. 109-144, 119 Stat. 2660 (2005); Terrorism Risk Insurance Program Reauthorization Act of 2007, Pub. L. No. 110-160, 121 Stat. 1839 (2007); and Terrorism Risk Insurance Program Reauthorization Act of 2015, Pub. L. No. 114-1, 129 Stat. 3 (2015). In this report, we collectively refer to the original act and its reauthorizations as TRIA.

with private insurers in the event of a certified act of terrorism.³ Insurers can charge their policyholders premiums for the insurer's potential share of losses. However, the federal government does not charge premiums for its potential share of losses before an event occurs. Rather, TRIA includes a provision that allows Treasury to recoup some of or all the federal share of losses after a certified terrorism event. To date, no terrorism events have been certified under TRIA.

Policymakers and insurance industry representatives have continued to debate the role of the federal government in supporting terrorism risk insurance. The program originally was intended to be temporary (3 years), but was extended and modified three times—in 2005, 2007, and 2015. Over this period, the reauthorizations have reduced federal responsibility for losses and increased private-sector responsibility for losses. Proponents of TRIA believe that the program provides a layer of protection the private market would not be willing to provide without a federal program in place. Others believe TRIA exposes the federal government to insurance losses on private properties and provides free reinsurance for private insurers because it does not require up-front funds for the losses that would be covered by the federal government.

The Terrorism Risk Insurance Program Reauthorization Act of 2015 includes a provision for GAO to review the effects and viability of alternative funding options. This report examines (1) how insurers manage their terrorism risk exposure and price terrorism risk insurance; (2) the federal government's recoupment requirements and how the federal share of terrorism losses would be affected in different scenarios; (3) how alternative funding approaches could be designed and implemented; and (4) the potential effects of the approaches.

³TRIA states that the Secretary of the Treasury, in consultation with the Secretary of Homeland Security and the Attorney General of the United States, shall determine whether an event should be certified as an act of terrorism, based on certain criteria. An act cannot be certified if the aggregate property/casualty insurance losses resulting from the act do not exceed \$5 million. The procedures for making the act of terrorism determination were issued by Treasury on December 7, 2016 as an interim final rule. In this report, we refer to the potential federal share of losses as the losses the federal government would cover before recoupment if a certified terrorism event occurred. Similarly, we refer to the potential share of insurers' losses as the aggregate losses affected insurers would be responsible for covering before recoupment.

To address these objectives, we reviewed TRIA and its amendments in 2005, 2007, and 2015, and implementing regulations.⁴ We also reviewed prior GAO work on this topic.⁵ We interviewed officials and reviewed reports from Treasury, the National Association of Insurance Commissioners (NAIC), the Congressional Budget Office, and Congressional Research Service.⁶ We also interviewed and reviewed relevant reports from academic researchers and several industry participants, including insurers, reinsurers, state regulators, representatives from insurance trade associations, a rating agency, and insurance and reinsurance brokers.⁷ In all interviews, we asked participants about practices under the current program funding structure, the feasibility of the alternative funding options, and the importance of key pricing objectives and set-aside design factors we identified. We also asked participants about the potential effects on insurers and reinsurers, state regulators, policyholders, and the federal government of the current program's recoupment mechanism and alternative funding options.

To describe insurers' practices for managing their terrorism exposure and pricing terrorism risk insurance, we reviewed NAIC guidance on terrorism premium disclosures for policyholders, and information about applicable

⁴Terrorism Risk Insurance Act of 2002, Pub. L. No. 107-297, 116 Stat. 2322 (2002); Terrorism Risk Insurance Extension Act of 2005, Pub. L. No. 109-144, 119 Stat. 2660 (2005); Terrorism Risk Insurance Program Reauthorization Act of 2007, Pub. L. No. 110-160, 121 Stat. 1839 (2007); and Terrorism Risk Insurance Program Reauthorization Act of 2015, Pub. L. No. 114-1, 129 Stat. 3 (2015); and 31 C.F.R. Part 50.

⁵GAO, *Terrorism Risk Insurance: Comparison of Selected Programs in the United States and Foreign Countries*, [GAO-16-316](#) (Washington, D.C.: Apr. 12, 2016); and *Terrorism Insurance: Treasury Needs to Collect and Analyze Data to Better Understand Fiscal Exposure and Clarify Guidance*, [GAO-14-445](#) (Washington, D.C.: May 22, 2014).

⁶Department of the Treasury, Federal Insurance Office, *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (Washington, D.C.: June 2016); President's Working Group on Financial Markets, *The Long-Term Availability and Affordability of Insurance for Terrorism Risk* (Washington, D.C.: April 2014); Congressional Budget Office, *Federal Reinsurance for Terrorism Risk in 2015 and Beyond*, Working Paper 2015-04 (Washington, D.C.: June 2015); and Congressional Research Service, *Terrorism Risk Insurance: Issue Analysis and Overview of Current Program*, R42716 (Washington, D.C.: July 23, 2014).

⁷Marsh and McLennan Companies, Inc., *2015 Terrorism Risk Insurance Report* (June 2015); Wharton Risk Management and Decision Processes Center, University of Pennsylvania, *TRIA and Beyond: Terrorism Risk Financing in the U.S.* (Philadelphia, Penn.: August 2005); and Erwann Michel-Kerjan, Paul Raschky, and Howard Kunreuther, "Corporate Demand for Insurance: New Evidence from the U.S. Terrorism and Property Markets," *The Journal of Risk and Insurance*, vol. 82, no. 3 (2015).

insurance tax laws and insurance accounting standards. In this report, the information on insurers' practices reflects statements from 6 insurers, including 4 of the top 10 insurers, and statements from industry participants. These statements are not generalizable.

To assess the extent to which the federal share of losses could be recouped, we conducted analyses of the federal and insurer shares of losses in various scenarios and how the federal share of losses would be apportioned between TRIA's mandatory and discretionary recoupment provisions.

To examine how alternative funding approaches could be designed and implemented, we considered two broad funding options, each of which could utilize various approaches in relation to purpose and design. First, we reviewed two ways a federal terrorism risk insurance charge could be structured: (1) as a premium-like charge to help pay for the federal share of potential losses, or (2) as a backstop charge, or fee, paid to the Treasury for the promise of payment of the federal share of losses, or backstop. In addition, we developed a pricing framework based on prior GAO work on government fees and interviewed industry participants. We also assessed how the objectives of the pricing framework are expressed in premiums or premium-like charges in selected federal and state programs and in charges for government-provided backstops provided in the national terrorism risk insurance programs of two selected countries. Programs were selected to illustrate a range of approaches for structuring and collecting charges. Second, we selected programs or proposals to identify key design factors and implementation considerations for policymakers if they implemented a requirement or incentives for insurer terrorism set-asides.⁸ Programs or proposals were selected to illustrate variation among the design factors. To describe the practices, laws, and rules the federal government could take into account in relation to a set-aside, we reviewed documentation on the selected approaches and sources describing relevant accounting standards, and tax laws. We also collected information on selected countries that allow insurers to establish set-asides to cover future losses. We identified the countries for review through external outreach efforts with international entities, literature review, and questionnaire and interview responses.

⁸For the purposes of this report, we use the term set-aside to refer to a variety of approaches that insurers could use to consider or account for terrorism exposure in their capital, assets, or liabilities. Such approaches do not always involve establishing segregated assets dedicated solely to covering terrorism exposure.

To assess the potential effects of recoupment and alternative funding approaches, we interviewed industry participants and analyzed insurance data from SNL Financial, annual terrorism risk insurance premium estimates from A.M. Best, and estimates of the percentage of commercial property insurance premiums represented by terrorism risk insurance by Marsh and McLennan Companies, Inc. (Marsh).⁹ Specifically, we assessed the potential effects of recoupment of the federal share of losses, a federal terrorism risk insurance charge, and terrorism set-asides on insurers and reinsurers, state regulation, policyholders, and the federal government. Using data and a number of informed assumptions, we illustrated the potential effects on policyholder prices and participation and insurer volume of premium under recoupment and the alternative funding approaches. The scenarios and potential effects are illustrative; they are not specific determinations of market effects or federal fiscal exposure.¹⁰ We determined that the data used in this report were sufficiently reliable for providing illustrative examples of potential effects. We also examined whether, and to what extent, the program provides an economic subsidy and illustrated the potential size of any subsidy. In this report, we define an economic subsidy as a payment or benefit from the government to private market participants, for which the government receives no commensurate benefit. The responses from industry participants may or may not be representative of all participants in the commercial property/casualty market, but their experiences and views offer insights directly into this group of insurers. Appendixes I, II, V, and VI provide more detailed information on our methodology.

We conducted this performance audit from January 2015 to January 2017, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe

⁹As of 2016, SNL Financial was a part of S&P Global Market Intelligence; however, for this report we refer to the data as originating from SNL Financial.

¹⁰We have defined fiscal exposures as responsibilities, programs, and activities that may legally commit or create expectations for future federal spending based on current policy, past practices, or other factors. As we previously reported, TRIA creates an explicit fiscal exposure, because the federal government is legally required to make payments (reimbursements to insurers) in the event of a certified terrorist attack. See [GAO-14-445](#). For more information on risks, including terrorism, that create fiscal exposures, see http://www.gao.gov/fiscal_outlook/federal_fiscal_outlook/overview#t=3.

that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

From an insurance standpoint, measuring and predicting terrorism risk is challenging. The difficulties of measuring and predicting losses associated with terrorism risks stem from factors including lack of experience with similar attacks, difficulty in predicting terrorists' intentions, and the potentially catastrophic losses from terrorist attacks.¹¹ To underwrite insurance—that is, decide whether to offer coverage and at what price—insurers consider both the likelihood of an event (frequency) and the amount of damage it would cause (severity). Although insurers increasingly have used sophisticated modeling tools to assess terrorism risk, from a statistical perspective little data exist on which to base estimates of future losses in terms of frequency or severity, or both.¹² Reinsurers (insurers for insurers) follow an approach similar to that of insurers for pricing risk exposures and charging premiums based on that risk and, therefore, face similar challenges in pricing terrorism risks.

Congress passed TRIA in 2002 to address some of the challenges the insurance industry and businesses faced after the September 11 attacks, when coverage for terrorism risk generally became unavailable. The goals of TRIA are to (1) protect consumers by addressing market disruptions and ensuring the continued widespread availability and affordability of commercial property/casualty insurance for terrorism risk; and (2) allow for a transitional period for the private markets to stabilize, resume pricing of such insurance, and build capacity to absorb any future losses, while preserving state insurance regulation and consumer protections.

As required by TRIA, insurers must make terrorism coverage available to commercial policyholders, although commercial policyholders are not

¹¹See [GAO-14-445](#).

¹²Insurance Information Institute, *Terrorism Risk and Insurance* (August 2013).

required to buy it.¹³ TRIA requires an insurer to make coverage for terrorism losses available that does not differ materially from the terms, amounts, and other coverage limitations applicable to losses arising from events other than acts of terrorism. For example, an insurer offering \$100 million in commercial property coverage must offer \$100 million in coverage for property damage from a certified terrorist event. As discussed in greater detail later in this report, insurers can charge a separate premium to cover their terrorism risk, although some include the coverage in their base rates for all-risk policies.¹⁴ Neither insurers nor the federal government charges for the government's coverage of terrorism risk under TRIA, but the government may recoup at least some of its losses following a terrorism event.

For eligible lines, TRIA covers insured losses resulting from an act of terrorism, which is defined, in part, as a "violent act or an act that is dangerous" to human life, property, or infrastructure.¹⁵ The act is silent about losses from attacks with nuclear, biological, chemical, or radiological weapons (NBCR).¹⁶

¹³Insurance lines of business are divided into two parts: (1) property/casualty and (2) life and health. Property/casualty insurance is further divided into personal and commercial lines. For example, personal lines include automobile, homeowners, and renters insurance for individuals. The major commercial lines include multiple perils, fire, liability, and workers' compensation. TRIA only applies to certain commercial property/casualty lines of insurance.

¹⁴Before September 11, 2001, insurers generally did not exclude or separately charge for coverage of terrorism risks. After September 11 (and prior to TRIA), insurers started including substantial charges to cover terrorism risk, or excluded the coverage with the exception of workers' compensation. (States require that workers' compensation insurance cover terrorism risk and do not permit exclusions.)

¹⁵TRIA-eligible lines are commercial lines of property/casualty insurance, including excess insurance, workers' compensation insurance, and directors' and officers' liability insurance. Subject to certain exceptions, eligible commercial lines also include the following (as listed in NAIC's Exhibit of Premiums and Losses): aircraft (all perils), allied lines, boiler and machinery, commercial multiperil (liability and nonliability), fire, inland marine, ocean marine, other liability, products liability, and workers' compensation. The law excludes reinsurance, personal property/casualty, crop, and private mortgage insurance; commercial automobile, burglary and theft, and professional liability insurance; and health and life insurance.

¹⁶GAO, *Terrorism Insurance: Status of Coverage Availability for Attacks Involving Nuclear, Biological, Chemical, or Radiological Weapons*, [GAO-09-39](#) (Washington, D.C.: Dec. 12, 2008).

Public-Private Loss Sharing under TRIA

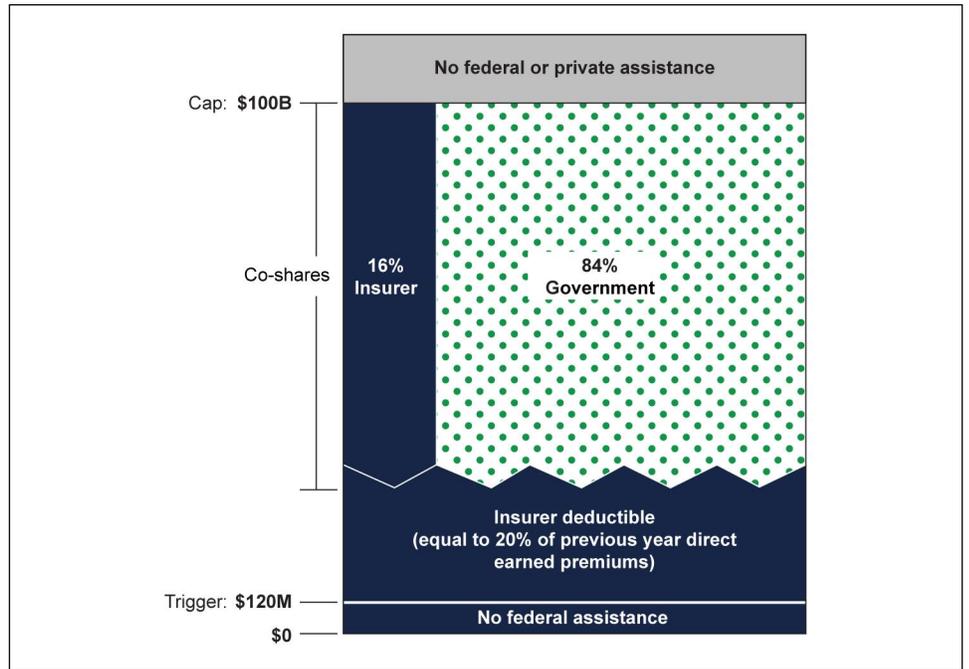
Initial loss sharing. In the event of a certified act of terrorism, TRIA's loss-sharing structure requires that insurers pay claims on covered terrorism losses and that Treasury reimburse individual insurers for losses that exceed a specified amount.¹⁷ For federal compensation to be paid, aggregate industry insured losses from certified acts must exceed a certain amount (program trigger). For calendar year 2016, this amount was \$120 million.¹⁸ An individual insurer with terrorism losses in excess of a deductible (20 percent of its previous year's direct earned premiums in TRIA-eligible lines) may make a claim to Treasury for payment of the federal share of compensation for its insured losses. As shown in figure 1, Treasury would reimburse the insurer for a certain percentage of its losses (84 percent for calendar year 2016) above the deductible, and the insurer would be responsible for the remaining portion (16 percent). Annual coverage for losses is limited (capped) so that aggregate industry insured losses in excess of \$100 billion are not covered by private insurers or the federal government.¹⁹

¹⁷TRIA has been described as a reinsurance program. While TRIA has some attributes of a reinsurance contract, it does not meet all the elements of traditional private reinsurance because the federal government does not collect a premium from insurers for the federal share of potential losses. Like a traditional private reinsurance contract, TRIA establishes the percentage of losses for a "ceding company" (in this case, the insurance companies providing terrorism risk coverage) and under what circumstances the losses are reimbursed by the "reinsurer" (in this case, the federal government through TRIA). However, unlike traditional private reinsurance, TRIA does not involve the transfer of risk in exchange for a premium. Instead, there is a transfer of risk in exchange for a recoupment mechanism.

¹⁸The 2015 reauthorization annually increases the required amount of aggregate insured losses to trigger the program by \$20 million, starting from \$100 million in 2015 and increasing to \$200 million by 2020. See Pub. L. No. 114-1, § 103(3), 129 Stat. 3, 4 (codified at 15 U.S.C. § 6701 n. § 103(e)(1)(B)).

¹⁹Insurers remain liable for amounts up to their deductible, even if the \$100 billion cap is reached.

Figure 1: Loss Sharing under the Terrorism Risk Insurance Act, as of 2016



Source: Adapted from Congressional Budget Office. | GAO-17-62

Requirements and Considerations for Establishing a Recoupment Surcharge

According to TRIA and regulations, the amount of any surcharge must be based on a percentage of the premium amount charged for TRIA-eligible commercial property/casualty insurance coverage under a specific policy. Treasury may take several factors into consideration when establishing the surcharge amount. The factors can include the total dollar amount to be recouped as a percentage of the industry's aggregate annual direct written premium; the economic impact on urban commercial centers, including on rents and insurance premiums, and the availability of lease space and commercial insurance in urban areas; and risk factors related to rural areas and smaller commercial centers. To help determine recoupment amounts, Treasury may issue a data call for insurer deductible and insured loss information. If an insurer determines that the administrative cost of collecting the surcharge would exceed the actual amount collected, the insurer may satisfy the obligation by omitting the actual collection and remitting to Treasury the amount due. Beyond these requirements and considerations, Treasury does not have a plan or single methodology for determining a recoupment surcharge. According to agency officials, setting a post-event surcharge would be based on the parameters of the specific terrorism event, such as the size of the federal share of losses, location of the event, and length of the collection period.

Legend: TRIA = Terrorism Risk Insurance Act

Treasury = Department of the Treasury

Source: TRIA and regulations and interviews with agency officials. | GAO-17-62

Recoupment. The federal share of losses may be recouped after a terrorist event through premium surcharges. As previously discussed, Treasury reimburses an insurer for a certain percentage of its losses above its deductible. And, if insurers' aggregate losses are below a specified amount, Treasury may be required to recoup federal losses through post-event premium surcharges. Figure 2 shows the TRIA funding mechanism before and after a terrorism event. Specifically, the program includes a provision for mandatory recoupment of at least a portion of the federal share of losses if the aggregate sum of all insurers' deductibles and co-shares are below an amount prescribed by TRIA—known as the industry aggregate retention amount.²⁰ Under mandatory recoupment, the insurers must impose and remit to Treasury a premium surcharge on all policies in TRIA-eligible lines until total industry payments reach 140 percent of any mandatory recoupment amount.²¹ Treasury establishes the amount of the mandatory recoupment surcharge. The collection timeframes for mandatory recoupment range from 1 year and 9 months to about 6.5 years, depending on when the terrorism event occurs.²²

²⁰Mandatory recoupment under TRIA does not relate to mandatory spending with regard to the federal budget. The industry aggregate retention amount in 2016 was the lesser of \$31.5 billion and the total of insurers' and federal shares of terrorism losses in the calendar year. This amount is increased by \$2 billion each year until it reaches \$37.5 billion. See table 1.

²¹The legislative and congressional records do not include any substantive discussion of the purpose of the 40 percent mandatory recoupment scaling factor. However, according to the Congressional Budget Office, the scaling factor would address lost federal tax revenue as policyholders deducted recoupment charges from their income taxes and provide some compensation to the government for bearing risk. See Congressional Budget Office, *Federal Reinsurance for Terrorism Risk in 2015 and Beyond*.

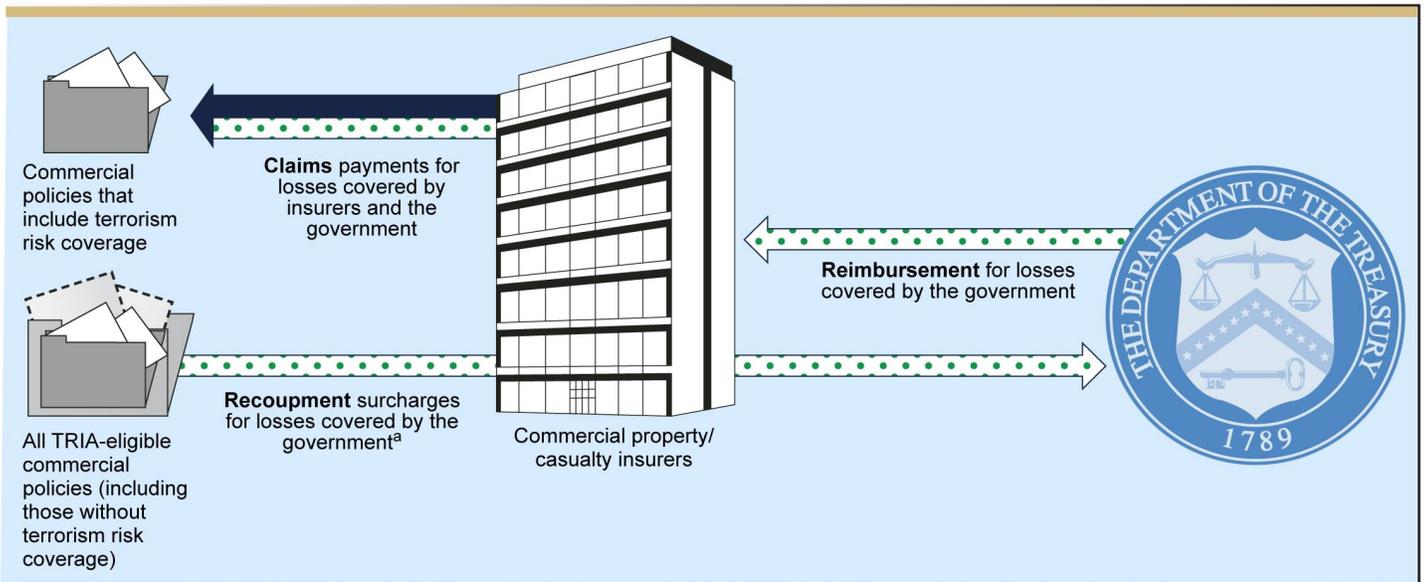
²²For any act of terrorism that occurs on or before December 31, 2017, the deadline for mandatory recoupment is September 30, 2019. For any act occurring between January 1 and December 31, 2018, 35 percent of any required amounts must be collected by September 30, 2019, and the remainder by September 30, 2024. For any act occurring on or after January 1, 2019, the deadline is September 30, 2024. 15 U.S.C. § 6701 n. § 103(e)(7)(E)(i).

Figure 2: Funding Mechanisms in the Terrorism Risk Insurance Program under the 2015 Reauthorization of TRIA

Before a terrorism event occurs



After a terrorism event resulting in losses covered by insurers and the government



Source: Terrorism Risk Insurance Program Reauthorization Act of 2015 (TRIA). | GAO-17-62

^aIn some terrorism events, the federal government may not be required to recoup its share of losses.

When federal assistance exceeds the mandatory recoupment amount, TRIA allows for discretionary recoupment.²³ Under the discretionary recoupment provision, Treasury may recoup additional amounts based on the ultimate cost to taxpayers of no additional recoupment, economic conditions in the marketplace, the affordability of commercial insurance for small and medium-sized businesses, and other factors Treasury considers appropriate.²⁴ Treasury also sets the surcharge for discretionary recoupment, but the increase to TRIA-eligible premiums must not exceed 3 percent per calendar year.²⁵

Changes in TRIA reauthorizations. As shown in table 1, the TRIA reauthorizations have changed several loss-sharing provisions of the program. Over time, the reauthorizations have reduced federal responsibility for losses and increased private-sector responsibility for losses. The 2015 reauthorization requires further incremental decreases in the federal share of losses over 5 years. In addition, the 2015 reauthorization requires insurers in the program to submit information to Treasury about the coverage they write for terrorism risk, including the lines of insurance with exposure to such risk, the premiums earned on such coverage, and the participation rate for such coverage.

Table 1: Selected Provisions in the Terrorism Risk Insurance Act and Its Reauthorizations, 2002–2015

	Terrorism Risk Insurance Act of 2002 (Pub. L. No. 107-297)	Terrorism Risk Insurance Extension Act of 2005 (Pub. L. No. 109-144)	Terrorism Risk Insurance Program Reauthorization Act of 2007 (Pub. L. No. 110-160)	Terrorism Risk Insurance Program Reauthorization Act of 2015 (Pub. L. No. 114-1)
Program trigger (dollar amount)	5 million ^a	50 million (2006) 100 million (2007)	100 million ^b	100 million in 2015 increasing by 20 million annually until it reaches 200 million in 2020

²³Discretionary recoupment under TRIA does not relate to discretionary spending with regard to the federal budget.

²⁴Following the initial determination of recoupment amounts, Treasury will recalculate any mandatory or discretionary recoupment amount as necessary and appropriate, and at least annually, until a final recoupment amount for the year is determined. To determine whether any additional amount will be recouped, Treasury also will compare any recalculated amount to amounts already remitted or to be remitted to Treasury for a previously established policy surcharge.

²⁵Unlike mandatory recoupment, discretionary recoupment has no specified collection time frame.

	Terrorism Risk Insurance Act of 2002 (Pub. L. No. 107-297)	Terrorism Risk Insurance Extension Act of 2005 (Pub. L. No. 109-144)	Terrorism Risk Insurance Program Reauthorization Act of 2007 (Pub. L. No. 110-160)	Terrorism Risk Insurance Program Reauthorization Act of 2015 (Pub. L. No. 114-1)
Insurer deductible (percentage)	7 (2003) ^c 10 (2004) 15 (2005)	17.5 (2006) 20 (2007)	20 ^b	20
Co-share (percentage)	Insurers: 10 Government: 90	Insurers: 10 Government: 90 (2006) Insurers: 15 Government: 85 (2007)	Insurers: 15 Government: 85 ^b	Insurers: 15 in 2015 increasing annually by 1 percentage point until it reaches 20 in 2020 Government: 85 in 2015 decreasing annually by 1 percentage point until it reaches 80 in 2020
Industry aggregate retention (dollar amount)	Lesser of (a) the aggregate amount of insured losses for all insurers during the calendar year and (b) 10 billion (2002/2003) 12.5 billion (2004) 15 billion (2005)	Lesser of (a) the aggregate amount of insured losses for all insurers during the calendar year and (b) 25 billion (2006) 27.5 billion (2007)	Lesser of (a) the aggregate amount of insured losses for all insurers during the calendar year and (b) 27.5 billion ^b	Lesser of (a) the aggregate amount of insured losses for all insurers during the calendar year and (b) 29.5 billion in 2015 increasing annually by 2 billion until it equals 37.5 billion in 2019 Beginning in calendar year 2020, the amount will become the lesser of (a) the aggregate amount of insured losses for all insurers during the calendar year and (b) the annual average of the sum of insurer deductibles for all insurers participating in the program for the prior 3 calendar years, as determined by the Secretary of the Treasury by regulation
Mandatory recoupment percentage, including surcharge (percentage)	100 of the difference between the industry aggregate retention amount and the aggregate amount of insurers' uncompensated insured losses ^d	100 of the difference between the industry aggregate retention amount and the aggregate amount of insurers' uncompensated insured losses	133 of the difference between the industry aggregate retention amount and the aggregate amount of insurers' uncompensated insured losses	140 of the difference between the industry aggregate retention amount and the aggregate amount of insurers' uncompensated insured losses
Program cap (dollar amount)	100 billion	100 billion	100 billion ^b	100 billion

Source: Terrorism Risk Insurance Act. | GAO-17-62

Note: We use Terrorism Risk Insurance Act to refer to the Terrorism Risk Insurance Act of 2002 and its amendments in 2005, 2007, and 2015. See Pub. L. No. 107-297, 116 Stat. 2322 (2002); Pub. L. No. 109-144, 119 Stat. 2660 (2005); Pub. L. No. 110-160, 121 Stat. 1839 (2007); and Pub. L. No. 114-1, 129 Stat. 3 (2015).

^aTRIA as initially enacted in 2002 did not include a specific program trigger, but an act of terrorism could not be certified without more than \$5 million in property/casualty insurance losses resulting from the act. Without a certified act of terrorism, TRIA is not activated.

^bThese provisions were unchanged by the 2007 act.

^cFrom enactment of the Terrorism Risk Insurance Act of 2002 on November 26, 2002, through December 31, 2002, the insurer deductible was set at 1 percent.

^dInsurers' uncompensated losses are those losses that are not reimbursed by the federal government under TRIA.

Regulation of Insurance

Insurance in the United States is primarily regulated at the state level.²⁶ State regulators license agents, review insurance products and premium rates, and examine insurers' financial solvency and market conduct. In addition, through the NAIC, state insurance regulators (of the 50 states, the District of Columbia, and the U.S. territories) establish standards and best practices, conduct peer reviews, and coordinate their regulatory oversight. For issues that involve a national standard or require uniformity among all the states, the NAIC develops and distributes model insurance laws and regulations for consideration among its member states.

Generally, state law requires insurers to file rates (and to file insurance forms) with state regulators who review the rates to ensure they are not excessive, inadequate, or unfairly discriminatory. States vary with regard to the timing and depth of reviews of insurers' rates and contractual language. Many state laws have filing or review exemptions (or both) that apply to large commercial policyholders. State insurance regulators do not perform rate or form reviews for these entities because it is presumed that large businesses have a better understanding of insurance contracts and pricing than the average personal-lines consumer and as such are able to effectively negotiate price and contract terms with insurers.

²⁶The federal government retains the authority to regulate insurance, but has given primary responsibility for insurance regulation to the states in accordance with the McCarran-Ferguson Act of 1945. See Pub. L. No. 79-5, ch. 20, 59 Stat. 33 (1945) codified as amended at 15 U.S.C. §§ 1011-1015. Nevertheless, the federal government is involved in many areas relating to the insurance sector, including operation of the National Flood Insurance Program and crop insurance program. In addition, the Board of Governors of the Federal Reserve System supervises insurers designated by the Financial Stability Oversight Council.

Capital requirements, accounting standards, and other tools help state regulators, insurers, and other entities monitor and mitigate potential risks and assess insurers' financial strength.

- **Risk-based capital requirements:** State regulators require insurance companies to maintain specific levels of capital to continue to conduct business.²⁷ Regulators determine the minimum amount of capital appropriate for an insurer to support its overall business operations, taking into consideration its size and risk profile. Most U.S. jurisdictions have adopted statutes, regulations, or bulletins that are substantially similar to NAIC's Risk-Based Capital for Insurers Model Act, according to NAIC, and also use formulas that NAIC has developed to establish a minimum capital requirement based on the types of risks to which a company is exposed. NAIC has separate models for different lines of insurance.
- **Own risk and solvency assessments:** Starting in 2015, state regulators began requiring large- and medium-size U.S. insurance groups to begin regularly conducting own risk and solvency assessments and submitting an annual written report to either the insurer group's lead state or state of domicile, depending upon if the assessment is prepared on a group or legal entity basis.²⁸ The assessments are internal processes undertaken by insurers or insurance groups to assess the adequacy of their risk management and current and prospective solvency positions under normal and severe stress scenarios.
- **Enterprise risk-management practices:** Insurance companies use these practices to obtain an enterprise-wide view of their risks and help management engage in risk-based decision making. Enterprise risk management generally has two goals: (1) to identify, evaluate, and quantify risks; and (2) to ensure that the organization actively implements risk-treatment strategies and manages appropriate risk levels. Examples of specific enterprise risk-management practices include identifying and categorizing risks, establishing well-defined

²⁷For this report, we define capital as the excess of an insurance company's assets above its liabilities. It provides a cushion to an insurer against insolvency resulting from any unexpected or underestimated losses. Insurers are generally free to manage their capital as long as they satisfy external solvency and liquidity requirements and internal assessment of capital adequacy.

²⁸NAIC's Risk Management and Own Risk and Solvency Assessment Model Act (no. 505) details the requirements for completing the annual own risk and solvency assessment and provides guidance and instructions for filing the associated summary report.

risk tolerances, assessing risk mitigation with cost-benefit analyses, and conducting stress tests and other risk-modeling analyses. Insurance companies must report much of this information annually in their summary reports for own risk and solvency assessments.

- **Accounting standards and financial reporting:** Insurers must report their financial holdings on an individual legal entity basis to the regulator in their state of domicile, using statutory accounting principles (SAP). According to documentation from NAIC, SAP are designed to assist state insurance departments in the regulation of the solvency of insurance companies. The ultimate objective of solvency regulation is to ensure that policyholder, contract holder, and other legal obligations are met when they come due and that companies maintain capital and surplus at all times and in such forms as required by statute to provide a margin of safety. SAP stress the measurement of ability to pay claims in the future. In addition to SAP, insurance groups may report financial holdings information using generally accepted accounting principles (GAAP), which in the United States are promulgated by the Financial Accounting Standards Board (FASB) and are designed to provide decision-useful information to investors and other users of financial reporting.²⁹ SAP and GAAP recognize certain items differently and therefore may result in different reported capital and net income amounts. Unless otherwise noted, references in this report to accounting for or recording liabilities refers to SAP.
- **Credit ratings:** A credit rating is generally intended to measure the likelihood of default for an issue or issuer, such as an insurer. To determine an appropriate rating, credit rating agencies determine the financial strength of insurance companies and their ability to meet ongoing obligations to policyholders by analyzing companies' balance sheets, operating performance, and business profile.³⁰

Insurers Use Various Tools to Manage Their Terrorism Risk Exposure and May Charge

²⁹In the United States, FASB establishes GAAP, a set of accounting standards, principles and best practices for the preparation of financial statements. Publicly owned companies in the United States are required to follow GAAP.

³⁰Ratings are typically assigned using letter designations such as AAA, AA, A, BBB, with higher grades usually representing a lower risk of default.

Premiums for Coverage Although They Face Pricing Challenges

Insurers we interviewed stated that they manage their terrorism exposure using several tools, and all said they generally charge premiums for terrorism risk coverage although data to accurately price terrorism risk are lacking. Insurers' practices for managing their exposure and pricing terrorism risk coverage are intended to cover their share of losses under TRIA (their deductibles and coshares). Insurers do not consider in their pricing the potential federal share of losses, which may be recouped after an event.

Insurers May Establish Location-Based Risk Limits, Consider Terrorism Risk in Capital Adequacy Assessments, and Purchase Reinsurance

Based on interviews we conducted in our previous work and our work for this report, insurers manage their terrorism exposure by establishing geographic risk limits, considering potential terrorism losses when assessing capital adequacy, and purchasing reinsurance.

Location-based risk limits. In our 2008 report, we found that the insurers we interviewed determined the amount of terrorism coverage they would be willing to provide in defined geographic areas, such as financial districts where many large buildings are located or specific parts of cities considered at high risk of attack.³¹ We also found that some insurers used models available from risk modeling firms to estimate the severity of potential attack scenarios to determine internal limits on the aggregate coverage they would offer in defined areas (aggregation limits). For example, they would limit their aggregate exposure in 250-foot, 500-foot, or quarter-mile circles around certain landmarks or areas where the insurer had high concentrations of risk.

Officials from two insurers we interviewed for this report discussed how they manage their terrorism exposure using aggregation limits. For example, one insurer stated that it manages its exposure based on estimated potential losses at more than 200 identified landmark locations

³¹See GAO, *Terrorism Insurance: Status of Efforts by Policyholders to Obtain Coverage*, [GAO-08-1057](#) (Washington, D.C.: Sept. 15, 2008).

spanning its U.S. exposure base. The insurer told us that it calculates its loss estimates for a conventional terrorism event that causes a building collapse at a single location. As part of this calculation, it told us that it considers the portion of potential losses that would be covered by the insurer, its reinsurer, and the federal government in setting an internal limit for terrorism exposure in each location.

Considering terrorism risk in managing and assessing capital. Most insurers we interviewed also stated they manage their terrorism risk by considering their terrorism risk exposure as part of external requirements or internal assessments related to capital adequacy. Insurers' capital generally is intended to be available for purposes such as unexpected losses and expanding the business and is not segregated for specific purposes (see fig. 3). Insurers are generally free to manage their capital as long as they satisfy external solvency and liquidity requirements as well as internal assessments. State regulators require insurance companies to maintain specific levels of capital (risk-based capital requirements), but their capital calculations do not specifically address terrorism risk exposure.³² However, rating agencies may assess insurers' terrorism risk exposure specifically as an indicator of financial strength. For example, A.M. Best's ratings evaluation methodology for terrorism risk includes calculating appropriate levels of capital for insurers with material terrorism risk exposure.³³

³²As previously discussed, most U.S. jurisdictions have adopted statutes, regulations, or bulletins that are substantially similar to NAIC's Risk-Based Capital for Insurers Model Act, according to NAIC, and also use formulas that NAIC has developed to establish a minimum capital requirement based on the types of risks to which a company is exposed.

³³A.M. Best provides news, credit ratings, financial data products, and other services for the insurance industry. A.M. Best's rating evaluation methodology for terrorism risk also includes conducting stress tests to quantify the impact that a large, insured terrorism loss could have on a primary insurer's capitalization if coverage under TRIA were not available. It also assesses the capital position of primary insurers whose largest direct terrorism risk exposures do not trigger the minimum threshold for coverage under TRIA.

Figure 3: Sample Insurance Company Balance Sheet



Source: GAO analysis of insurance and accounting information. | GAO-17-62

In their own internal assessments of capital adequacy, insurers may decide to exceed what is required. Most U.S. insurers hold several times more capital than states require. In addition, although not required under NAIC's risk-based capital calculations, five of the six insurers we interviewed stated that they specifically measure their terrorism risk exposure in determining the appropriate amount of capital to maintain,

including three insurers which indicated that they specifically consider their terrorism risk exposure due to rating agency assessments. One insurer explained that its capital calculations include estimates for its potential deductible and copayments under the current TRIA structure.

Three insurers we interviewed stated they also consider terrorism risk in their internal enterprise risk-management assessments or their own risk and solvency assessments—two internal processes insurers use to monitor and mitigate potential risks. Because own risk and solvency assessments are a recent requirement from state regulators applicable to large- and medium-size insurers, few insurers and regulators we interviewed had experience with them at the time of our review. For example, one state regulator stated that it had reviewed some insurers' filings for the assessments, which discussed risk management for multiple terrorism events, while another state regulator had not yet seen terrorism risk addressed specifically in insurers' filings.

Insurers may consider terrorism risk exposure in their assessments of the adequacy of capital, but they do not set aside funds specifically for potential future terrorism losses in their assets or liabilities. Insurers' assets are available for potential covered losses and generally are not segregated or restricted for limited uses. However, in some circumstances insurers may segregate or restrict their assets for specific purposes such as for collateral. None of the insurers we interviewed indicated doing so for potential terrorism losses. Insurers generally account for actual or expected claims by establishing loss reserves as liabilities on their balance sheet. As with all future losses, insurers cannot create loss reserves for potential terrorism losses before an event occurs. Specifically, accounting standards for recording insurance liabilities state that insurers may create a loss reserve only for a covered event that has occurred and for which the cost of the event is estimable.³⁴ No liability exists without the occurrence of a covered event. Insurance and state regulatory officials we interviewed confirmed that insurers do not include

³⁴Statement of Statutory Accounting Principles no. 55 establishes the principles for recording liabilities for paid and unpaid losses and loss adjustment expenses for property casualty companies. See also Financial Accounting Standards Board Accounting Standards Codification 450-20 and 944. Furthermore, federal tax laws only allow tax deductions to insurance companies for an increase to loss reserves that result from events that have already occurred. See 26 U.S.C. §832(b)(5) and (c)(4); 26 C.F.R. § 1.832-4(b). In general, insurers may deduct the discounted value of estimated losses that have been incurred and that they will be required to pay under insurance policies currently in force.

estimated potential future losses for terrorism or other potential catastrophic events in loss reserves.

Purchasing reinsurance. Five of the six insurers we interviewed purchase reinsurance to help manage their terrorism exposure.³⁵ Most of these insurers used a portion of the terrorism premiums they collected to purchase the reinsurance.³⁶ As we previously reported, primary insurers may purchase reinsurance for potential terrorism losses up to the difference between what they are willing to cover in a terrorism event and the sum of their TRIA deductible and co-share under the program.³⁷ Four of the six insurers we interviewed said they purchased treaty reinsurance coverage, which usually covers a part or a percentage of a book of an insurer's business across multiple risks.³⁸ According to a reinsurance broker we interviewed, the majority of terrorism reinsurance is sold along with other property/casualty coverage. One insurer also stated that on rare occasions it purchased facultative reinsurance (which covers individual policies) for specific risks or unique cases. Finally, another insurer we interviewed stated it purchased stand-alone terrorism risk reinsurance—coverage for terrorism risks only—for all policies with terrorism coverage.³⁹

³⁵Reinsurance—insurance for insurers—is generally defined as the transfer of risk by which one party (a reinsurer), in consideration of a premium paid, agrees to pay the incurred losses of a primary insurer (the reinsured) for all or part of the loss the insurer may sustain under the policy or policies it has written.

³⁶Most insurers we interviewed stated they tracked premiums collected by risk and thus could distinguish terrorism risk premiums used to purchase reinsurance. One insurer tracked premiums by line of business. When there are no losses, any additional premiums attributable to terrorism risk flow into capital, according to two insurers we interviewed.

³⁷See [GAO-08-1057](#).

³⁸Two basic types of reinsurance contracts exist—treaty and facultative. In a treaty reinsurance contract, the reinsurer and insurer agree on which class(es) of underlying policies of the insurer's to underwrite. In a facultative reinsurance contract, the reinsurer and insurer agree on individual underlying policies.

³⁹According to a reinsurance broker we interviewed, terrorism risk reinsurance pricing is largely based on whether the company has exposure in large metropolitan areas and on its retention amount (the maximum losses the insurer will carry on its own). According to the broker, sufficient terrorism risk reinsurance capacity does not exist in metropolitan areas and reinsurance pricing can be high compared to rural areas.

Although Data to Accurately Price Terrorism Risk Insurance Are Lacking, Insurers That Charge Premiums for Their Share of Potential Losses May Use Loss Models and Factors Such as Location

Insurers we interviewed acknowledged the difficulty of pricing terrorism risk and attributed it to the lack of data on terrorism risk. We previously found that insurers' primary concern with respect to covering terrorism risks was limiting the amount of their exposures and that pricing was secondary.⁴⁰ For most insurance products, insurers typically estimate the frequency and severity of an insurable risk based on data from past events to help calculate premiums that are commensurate with their risk exposure. However, as previously discussed, terrorism risk insurance is challenging to price because the frequency and severity of terrorism events are difficult to predict and quantify. As we concluded in prior work, because the frequency and severity of terrorism events are difficult to predict, the limits established in TRIA (which cap the potential severity of losses to insurers) make underwriting the risk and determining a price for terrorism coverage easier for insurers.⁴¹ However, one insurer and one reinsurer we interviewed expressed concern that primary insurers do not charge premiums sufficient to reflect their terrorism risk exposure.

The charge for terrorism risk coverage generally represents a small percentage of the overall commercial property/casualty premium, if insurers explicitly charge for it at all. According to insurers we interviewed, terrorism risk insurance is generally provided in conjunction with

Additional Data on Terrorism Risk Insurance Are Forthcoming

During the time of our data collection, limited data were available on terrorism risk insurance. However, Treasury and NAIC collected data in 2016. In response to the 2015 TRIA reauthorization, Treasury began collecting data on the terrorism risk insurance market. In June 2016, Treasury issued its initial report on the effectiveness of TRIA based on a voluntary data call concerning the pricing of terrorism coverage, among other items. In addition, NAIC is in the process of analyzing data it has received for workers compensation related to terrorism risk exposure and received data on other TRIA-eligible commercial lines in the fall of 2016, according to agency officials.

Treasury issued regulations in December 2016 formalizing the procedures for data collection required by the 2015 TRIA reauthorization. The regulations go into effect on January 17, 2017.

Legend: TRIA = Terrorism Risk Insurance Act
NAIC = National Association of Insurance Commissioners

Source: GAO. | GAO-17-62

⁴⁰See [GAO-14-445](#).

⁴¹See [GAO-14-445](#).

commercial property/casualty policies.⁴² For most TRIA-eligible lines, five of the six insurers we interviewed told us that they generally charge a percentage of overall property/casualty premiums for their share of terrorism risk coverage under TRIA.⁴³ A report from Marsh found that from 2012 to 2015 policyholders paid between 3 percent and 5 percent of their total property premium for terrorism risk coverage.⁴⁴ According to Treasury's 2016 report, on average, reporting insurers that charged for terrorism risk insurance charged about 2.6 percent of the total policy premium for terrorism risk coverage and the percentage charged varied from 0.7 percent to 7.1 percent, depending on the line of insurance.⁴⁵ However, according to Treasury's 2016 report, although an explicit premium is charged for terrorism risk coverage in the majority of cases, about 23 percent of reporting insurers did not identify explicit terrorism risk premiums for such coverage.⁴⁶ The report stated that insurers may not explicitly charge for terrorism risk coverage for reasons such as lack of any cognizable terrorism risk in certain regions or under certain policies or to ease administrative burden.⁴⁷ An official from an insurance broker

⁴²Terrorism risk coverage also may be provided through standalone policies that solely address terrorism-related risk and do not cover losses arising from other perils. Five of the six insurers we interviewed did not provide standalone terrorism risk coverage. One insurer we interviewed stated that it provides standalone terrorism coverage only in limited circumstances. Treasury reported similar trends in standalone terrorism risk policies. According to its 2016 report, only about 2.5 percent of the total terrorism risk premiums reporting insurers collected was associated with standalone terrorism risk policies. However, Treasury notes that the reported data likely understate the total proportion of the market addressed by stand-alone policies because of the lack of information on the type of insurers that issue such policies. See *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (June 2016).

⁴³As previously discussed, neither insurers nor the federal government charges for the potential federal share of terrorism losses before such losses occur. Four of the six insurers we interviewed said they use language in an NAIC model bulletin to disclose that the premium they charge does not include any charges for the portion of loss the federal government may cover under TRIA.

⁴⁴Marsh (of Marsh and McLennan Companies, Inc.) is one of the largest business insurance brokers in the United States. Marsh's data consist solely of property policies and represent their clients. They cannot be generalized to the entire market. Marsh, *2016 Terrorism Risk Insurance Report*.

⁴⁵See *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (June 2016).

⁴⁶See *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (June 2016). For this report, Treasury obtained data on a voluntary basis from insurers that represented about 41 percent of direct earned premiums in TRIA-eligible lines in 2015.

⁴⁷Later in this report, we discuss administrative burden that may be associated with upfront charges such as terrorism risk premiums.

we interviewed also stated that some insurers do not include an additional charge for terrorism coverage in many of their policies.

While one insurer we interviewed charges a flat rate for terrorism risk coverage—that is, a premium rate per dollar of coverage that did not vary with location or other risk factors—four of the six insurers we interviewed consider location as a risk factor and thus charged policyholders located in densely populated areas a higher rate for the coverage. For example, one insurer stated it uses a model from the Insurance Services Office that uses a risk classification system that places urban centers into one of three tiers of risk classes.⁴⁸ The insurer then enters its own terrorism risk exposure information into the model to price terrorism risk coverage.

According to insurers we interviewed, other risk factors insurers consider to price terrorism risk coverage include building occupancy rates; industry; and proximity to airports, federal buildings, and subways. For example, one insurer stated it created a range for terrorism risk insurance pricing in which risks are slotted into low, medium, and high codes based on industry sectors to determine the starting point for pricing. Once assigned to a pricing slot, the insurer assesses risk-based factors such as location and occupancy. Depending on the number of high-risk characteristics that apply, the insurer will select a specific price from the range.

Terrorism risk pricing for workers' compensation lines of insurance—which cover an employer's liability for medical care and physical rehabilitation of injured workers and helps to replace lost wages of injured workers—is more standardized when compared to other TRIA-eligible lines. For workers' compensation lines, insurers in 38 states use rates developed by the National Council on Compensation Insurance (NCCI).⁴⁹ According to NCCI, to help set workers' compensation premium rates that include terrorism risk, NCCI uses information from modeling firms. These

⁴⁸The Insurance Services Office is a source of information covering a range of personal and commercial lines of insurance. The company provides, among other things, statistical, actuarial, and claims information. Company representatives told us their data for commercial lines represent approximately two-thirds of the U.S. domestic industry's premium volume. These data represent the majority of commercial property/casualty lines (except workers' compensation) and primarily includes business written in the admitted market (that is, insurance policies or products purchased from companies or agents admitted or licensed to sell in a state).

⁴⁹NCCI gathers data, analyzes industry trends, and prepares objective insurance rate recommendations.

firms select various scenarios (different weapons, locations, damages, and frequencies), estimate the amount of damage to human life and the amount of losses under each scenario, and assign probabilities to each scenario. For workers' compensation lines of insurance in general, NCCI representatives stated that they typically set rates using actual data on the number, types, and costs of workplace injuries. However, the paucity of data about actual terrorism events—and the workplace injuries that could result—necessitates the use of modeling techniques using various assumptions to estimate potential losses from terrorism events.

According to NCCI officials, NCCI sets one rate for terrorism risk in each of the 38 states it manages (that is, rates do not vary within a state for other factors such as location, company size, or industry). Rates can vary across states because of the perceived risk of terrorism being higher in one state than another. Each state also may impose local surcharges on the NCCI rate for that state. States that do not rely on NCCI either use a state rating agency to set rates for terrorism risk, or require employers to obtain workers' compensation insurance from a compulsory state fund. State rating agencies operate similarly to NCCI in setting one rate for terrorism risk insurance for the entire state.

Federal Share of Terrorism Losses and Recoupment Requirements Depend on Event Size and Aggregate Premium Base of Affected Insurers

Our analyses showed that the federal government (initially) may sustain a greater share of losses in more catastrophic terrorism events, and in some scenarios recoupment may not be required. TRIA requires Treasury to reimburse affected insurers for a certain percentage of their losses above their individual deductibles and Treasury may recoup some or all of its losses through post-event premium surcharges on all TRIA-eligible policyholders. The federal share of losses depends on the size of the terrorism event and the aggregate direct earned premiums in TRIA-eligible lines among affected insurers (premium base). In addition, recoupment may be mandatory, discretionary, or a combination depending on the size of the event and the premium base. Finally, because the 2015 reauthorization incrementally shifts a greater share of losses from the federal government to insurers from 2016 to 2020, the date of the terrorism event also affects how losses would be shared and

how the federal share of losses would be apportioned between mandatory and discretionary recoupment provisions.

Event Size, Deductibles, and Premium Base Drive the Initial Federal Share of Losses

As shown in figure 4 and consistent with the manner in which the program is structured, our analyses showed that the initial government share of losses (amounts the federal government would reimburse insurers and prior to any recoupment from policyholders) would be greater following events with more total insured losses.⁵⁰ Using a number of informed assumptions, we analyzed loss scenarios for hypothetical terrorism events in 2016 with varying amounts of total insured losses (\$25 billion, \$50 billion, \$75 billion, and \$100 billion) and affecting varying subsets of insurers.⁵¹ An individual insurer's losses are the sum of its deductible and co-share. Under TRIA, an insurer's individual deductible is calculated based on its direct earned premium in TRIA-eligible lines of insurance. For our analyses, we constructed insurers' aggregate deductibles, which are equal to the sum of 20 percent of each affected insurer's previous year's direct earned premiums in TRIA-eligible lines (premium base).⁵² We used direct earned premiums of the top 4, top 10, top 20, and all TRIA-eligible insurers as proxies to represent various-sized premium bases.⁵³ For more information on these scenarios and others, see appendix II.

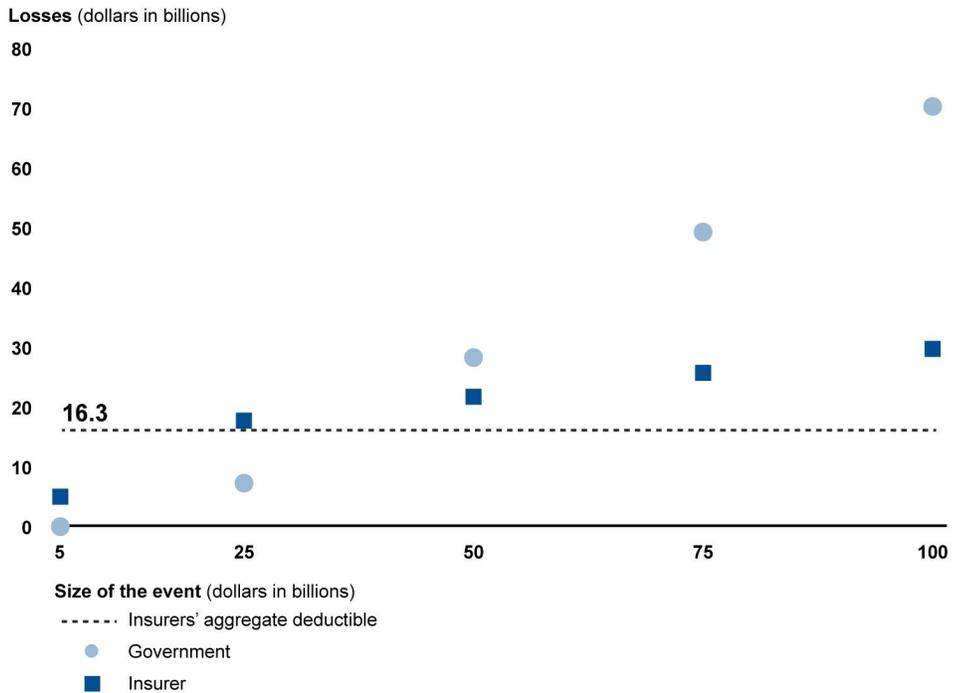
⁵⁰According to Treasury's 2016 report, higher participation rates increase the likelihood that losses from a terrorism event will be covered by private capital from commercial insurers. See *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (June 2016). Analyses we conducted for additional scenarios resulted in similar trends as illustrated in figure 4. For more information, see appendix II.

⁵¹See appendixes I and II for more information on our analyses, including the assumptions we used.

⁵²For our analysis, we assume all affected insurers incurred losses equal to or exceeding their individual deductibles. Using this assumption, we constructed aggregate insurer deductible amounts for the purposes of our analyses.

⁵³The direct earned premium associated with insurers—rather than the number of insurers—is important because direct earned premium determines the aggregate insurer deductible. For example, an aggregate insurer deductible for a different subset of insurers would equal the aggregate insurer deductible for the top four insurers' if the total of their direct earned premiums were also equal.

Figure 4: Initial Loss-Sharing Amounts under Terrorism Risk Insurance Act for Hypothetical 2016 Terrorism Events Affecting a Premium Base Equal to That of Top 10 Insurers



Source: GAO analysis of 15 U.S.C. § 6701 note, and SNL Financial's insurer direct earned premium data. | GAO-17-62

Notes: The initial loss sharing amounts depicted reflect federal reimbursements to private insurers and do not account for the amounts Treasury may recoup under the Terrorism Risk Insurance Act, as amended (TRIA). The direct earned premium associated with the insurers (premium base) rather than the number of insurers is important because prior-year direct earned premium determines the aggregate insurer deductible. In this example, we used the direct earned premiums of the top 10 TRIA-eligible insurers as a proxy for a premium base. The total of direct earned premium for a different subset of insurers' could equal the direct earned premiums of the top 10 insurers. The dashed line represents the aggregate insurer deductible associated with the top 10 insurers.

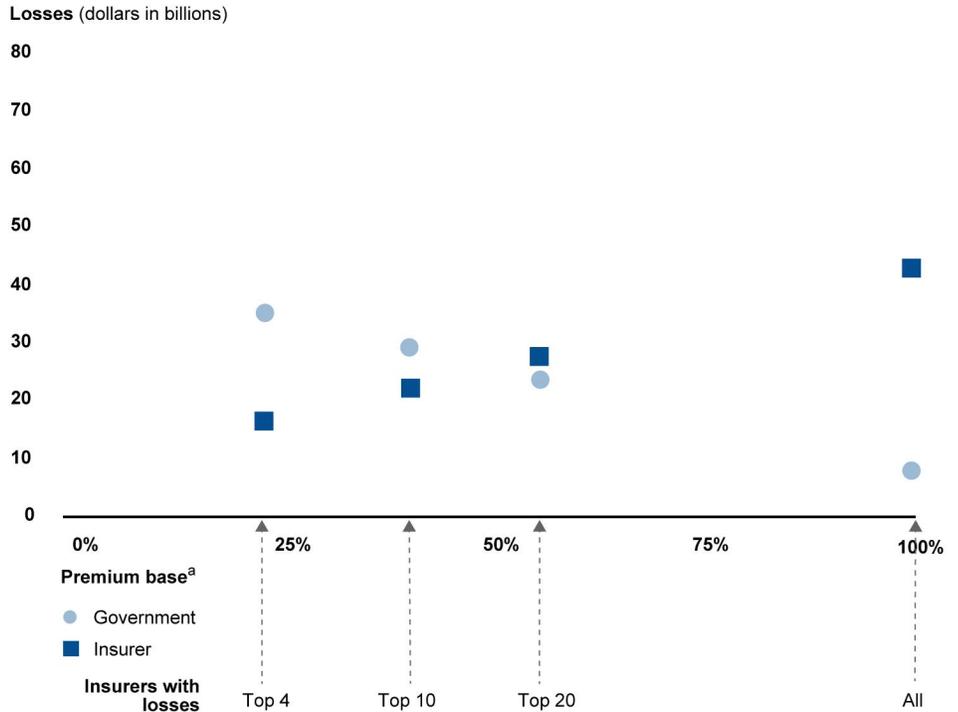
Additionally, our analyses showed that the initial proportion of losses that would be borne by the federal government and insurers depends, in part, on the amount of losses from the terrorism event relative to aggregate deductibles.

- **The federal government would not bear the cost of any losses if the total losses were less than insurers' aggregate deductibles.** For example, in an event that affected insurers with a premium base equal to that of top 10 insurers and resulted in \$5 billion in total losses, insurers likely would sustain all losses, because insurers' losses likely would fall below their respective deductibles.

- **Losses in excess of the insurers' deductibles would be shared between insurers and the federal government.** For example, in an event that affected insurers with a premium base equal to that of the top 10 insurers and resulted in \$50 billion in total losses, insurers and the federal government would share the losses above the insurers' deductibles. In this example, insurers' deductibles would not cover all losses.
- **As total losses increase above the insurers' deductibles, the government share of losses increases at a higher rate than the insurers' share of losses.** Because the federal co-share is much larger (84 percent in 2016) than the insurer co-share (16 percent in 2016), the initial federal share of losses is much higher than insurers' share of losses in events with higher total losses. For example, in an event that affected insurers with a premium base equal to that of the top 10 insurers and resulted in \$75 billion or \$100 billion in losses, the government share of losses would be much larger than the insurers' share.

In addition, our analyses showed that as losses are shared by insurers representing a larger premium base, the government share would decrease. This occurs, in part, because as the aggregate premiums of affected insurers increase, the aggregate insurers' deductible also increases. For example, as illustrated in figure 5, in an event that resulted in \$50 billion in losses, the portion of the losses covered by the federal government decreases as the aggregate premium base among the affected insurers increases.

Figure 5: Initial Loss-Sharing Amounts under Terrorism Risk Insurance Act for Hypothetical \$50 Billion Terrorism Event Occurring in 2016 and Affecting Various Premium Bases



Source: GAO analysis of 15 U.S.C. § 6701 note, and SNL Financial's insurer direct earned premium data. | GAO-17-62

Notes: The initial loss-sharing amounts depicted reflect federal reimbursements to private insurers and do not account for the amounts Treasury may recoup under the Terrorism Risk Insurance Act, as amended (TRIA). The direct earned premium associated with the insurers (premium base) rather than the number of insurers is important because prior-year direct earned premium determines the aggregate insurer deductible. We used the top 4, top 10, top 20, and all TRIA-eligible insurers as proxies to represent various-sized premium bases. For example, the total of direct earned premium for a different subset of insurers could equal the direct earned premiums of the top 4 insurers.

^aThe premium base represents the percentage of TRIA-eligible direct earned premiums in 2014.

Recoupment of Federal Losses Could Be Mandatory, Discretionary, or a Mixture of Both Depending on Event Size and Premium Base

The federal share of losses that could be recouped may fall under the mandatory provision, the discretionary provision, or both. As illustrated in figure 6, our analyses showed that the proportion of mandatory and discretionary recoupment amounts depends on the total amount of terrorism losses (event size), the subset of insurers that sustained losses, and whether insurers' losses were more or less than the industry

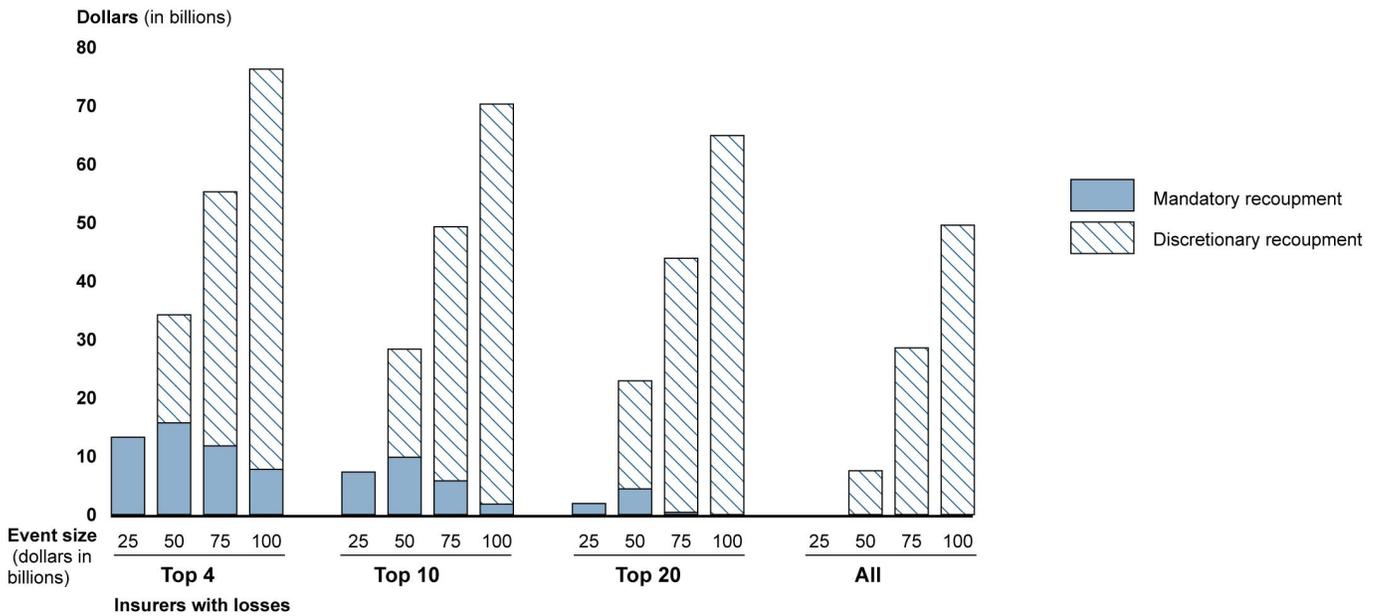
aggregate retention amount.⁵⁴ General recoupment scenarios and examples from our analyses are described below.

- **The federal government may be required to recoup its total share of losses.** If the total losses from the terrorism event were less than the industry aggregate retention amount, all government losses must be recouped under the mandatory recoupment provision. For example, in an event that resulted in \$25 billion in losses regardless of the premium base of affected insurers, all recoupment would be mandatory because the total losses would be below the industry aggregate retention amount (\$31.5 billion in 2016). The amount recouped would be the difference between total losses and the insurers' share of losses.
- **The federal government may not be required to recoup any of its losses.** If insurers' share of losses exceeded the industry aggregate retention amount, all government losses would fall under the discretionary provision and equal the difference between all losses or the maximum loss cap (whichever was lower) and the insurers' share of losses. For example, our analyses showed that all recoupment would be discretionary for an event where all insurers were affected because the aggregate insurer deductible would exceed the industry aggregate retention amount.
- **The federal government may be required to recoup only a portion of its losses.** If total losses exceeded the industry aggregate retention amount and insurer losses were less than the retention amount, the government share of losses would fall under both the mandatory and discretionary provisions. The mandatory portion would be the difference between the retention amount and the insurers' losses. The discretionary portion would be the difference between total losses or the maximum loss cap (whichever was lower) and the aggregate industry retention amount. For example, when affected insurers had an aggregate premium base equal to that of the top 4 or top 10 insurers and the total losses exceeded \$31.5 billion (\$50 billion, \$75 billion, or \$100 billion in total losses), recoupment would be split between mandatory and discretionary because the insurers'

⁵⁴The industry aggregate retention amount in 2016 would be the lesser of \$31.5 billion and total of insurers' and federal shares of losses in the calendar year. The annual increase in industry aggregate retention amount from 2015 to 2020 would result in increasing portions of federal losses that would be mandatorily recouped and decreasing portions of losses that could be discretionarily recouped for events with the same amount of losses.

losses were less than the industry aggregate retention amount but the total losses exceeded the aggregate retention amount.

Figure 6: Potential Mandatory and Discretionary Recoupment Amounts under 2015 Reauthorization of Terrorism Risk Insurance Act for Different Event Sizes and Subsets of Affected Insurers, 2016



Source: GAO analysis of 15 U.S.C. § 6701 note, and SNL Financial's insurer direct earned premium data. | GAO-17-62

Notes: The mandatory recoupment amounts depicted do not include the 40 percent mandatory recoupment scaling factor. The direct earned premium associated with the insurers rather than the number of insurers is important because prior-year direct earned premium determines the aggregate insurer deductible. We used the top 4, top 10, and top 20, and all TRIA-eligible insurers as proxies to represent various-sized premium bases. For example, the total of direct earned premium for a different subset of insurers could equal the direct earned premiums of the top 4 insurers.

As figure 6 illustrates, our analyses also showed patterns in the portions of losses to be recouped under the mandatory and discretionary provisions. Losses recouped under the mandatory provision decreased as the aggregate premiums base of insurers with losses increased. Of the event sizes that we analyzed, events with \$40-50 billion in losses generally resulted in the highest mandatory recoupment across the premium bases.⁵⁵ The discretionary recoupment amount increased as the size of the event increased, and in very large events could exceed \$60 billion. Discretionary recoupment generally was not affected by the

⁵⁵In some cases, the mandatory recoupment amount exceeded \$20 billion, including the 40 percent mandatory recoupment scaling factor.

aggregate premium base of affected insurers. For example, for all insurer subsets, the discretionary portion of recoupment increased with the event size, but the size of the discretionary portion for each event size generally would be the same whether the affected insurers' aggregate premium base was equal to that of the top 4, top 10, or top 20 insurers.⁵⁶

Loss Sharing and Recoupment Amounts Also Affected by Date of Terrorism Event

In addition to the total amount of losses and the aggregate premium base of insurers with losses, the date of a terrorism event would affect how losses would be shared after a terrorism event and how federal losses would be apportioned between recoupment provisions. Specifically, the 2015 reauthorization of TRIA incrementally shifts a greater share of losses from the federal government to insurance companies in 2016-2020, as shown in table 2.⁵⁷ For example, for loss sharing, the increases in the program trigger will increase the total insured losses that must occur before the government would incur any losses. In addition, the increase in insurer co-share will decrease the federal share for losses above the insurers' aggregate deductible. For federal losses apportioned between mandatory and discretionary recoupment, the industry aggregate retention increases by \$2 billion per year. This change potentially shifts a portion of the federal share of losses from the discretionary recoupment provision to the mandatory provision.

Table 2: Selected TRIA Characteristics Relevant to Recoupment, If the Event Occurred in 2016-2020

Characteristic	2016	2017	2018	2019	2020
Program trigger (dollars in millions)	120	140	160	180	200
Insurer co-share (percentage)	16	17	18	19	20
Industry aggregate retention (dollars in billions) ^a	31.5	33.5	35.5	37.5	Average amount of insurers' deductibles for the prior 3 years

⁵⁶If all insurers were affected, the federal share of losses would be smaller because the industry share of losses would be larger, resulting in a smaller discretionary recoupment amount.

⁵⁷Pub. L. No. 114-1 § 102, 103(3), 129 Stat. 3, 4 (2015).

Characteristic	2016	2017	2018	2019	2020
Deadline for collecting mandatory portion of recoupment	Sept. 30, 2019	Sept. 30, 2019	35 percent by Sept. 30, 2019 and the remainder by Sept. 30, 2024	Sept. 30, 2024	Sept. 30, 2024
Effective time frame to collect mandatory portion of recoupment ^b	2 years and 9 months	1 years and 9 months	35 percent in 9 months, the remainder in 5 years	4 years and 9 months	3 years and 9 months

Source: GAO analysis of the Terrorism Risk Insurance Act (TRIA) at 15 U.S.C. § 6701 note. | GAO-17-62

^aIf total insurers' losses (sum of deductibles and co-shares) exceed the industry aggregate retention amount, no mandatory recoupment would occur.

^bTo determine the effective time frame, we assumed Treasury would begin collecting the surcharge in the January following the event.

The differing mandatory recoupment collection time frames from 2016 to 2020 could affect potential premium increases due to recoupment surcharges. While discretionary recoupment surcharges must not increase annual TRIA-eligible premiums by more than 3 percent, mandatory recoupment surcharges in part would be determined by the deadlines for collecting mandatory recoupment. For example, our analyses showed potentially large surcharges resulting from events that occurred in 2017 (the year with the shortest collection time frame).

Alternative Funding Options Pose Trade-offs and Complexities

The two alternative funding options we analyzed would require trade-offs and present complexities. First, the option of a federal charge for terrorism risk insurance could be collected to pay for the federal share of potential losses or to cover the cost of the federal guarantee under TRIA. Second, the option of insurer set-asides—through which insurers would more explicitly address their terrorism exposure through their capital, assets, or liabilities—could be used to help cover insurers' share of potential terrorism losses or both insurers' and the federal government's share of potential losses.

A Federal Charge for Terrorism Risk Insurance Would Involve Significant Trade-offs

Depending on the approach, a federal terrorism insurance charge may help promote some pricing objectives but could involve significant limitations and trade-offs. Based on our prior work on designing and assessing federal user fees, other government-collected funds, and user-

based taxes, we identified pricing objectives and characteristics that could have some applications for policymakers in considering various approaches for a federal charge for terrorism risk insurance, as shown in table 3.⁵⁸ Using four pricing objectives (promoting economic efficiency, equity, revenue adequacy, and limiting administrative burden), we evaluated two approaches for a voluntary or required federal charge for terrorism risk insurance:

Premium-like charge: A charge that would be intended to help pay for the federal share of potential losses and could replace the current recoupment provision. Such a charge could be an amount based on risk using insurance principles or it could be designed as a flat rate or vary based on insurer or insured characteristics.⁵⁹

Backstop charge: A charge or fee paid to the Treasury for the promise of payment of the federal share of losses, or backstop. Such a charge could be determined in a variety of ways, but it would not necessarily be based on insurance principles. In addition, recoupment could still be in place to cover the federal share of losses as the charge would not be intended to be adequate to cover potential losses.⁶⁰

Policymakers may face tradeoffs among the pricing objectives as no single design will satisfy all parties on all dimensions, and the level of importance different policymakers may place on different objectives will vary, depending on how they value the characteristics of each.

⁵⁸See, GAO, *Federal User Fees: A Design Guide*, [GAO-08-386SP](#) (Washington, D.C.: May 29, 2008); and *Federal User Fees: Fee Design Options and Implications for Managing Revenue Instability*, [GAO-13-820](#) (Washington, D.C.: Sept. 30, 2013).

⁵⁹For examples of how selected federal and state programs structure charges to achieve pricing objectives, see appendix III.

⁶⁰In prior work, we reviewed and compared the structures of selected foreign terrorism risk insurance programs. The programs in Australia and the United Kingdom each pay a charge to their governments for their backstops. See [GAO-16-316](#).

Table 3: Framework of Pricing Objectives and Related Characteristics of Potential Federal Charge Structures

Objectives:	Characteristics:
Promote economic efficiency	<ol style="list-style-type: none"> 1. charges participants according to their level of risk 2. charges participants according to their insurable value 3. takes into account mitigation activities 4. makes participation in program mandatory
Promote equity	<ol style="list-style-type: none"> 1. takes fairness into account by charging a similar price to participants with similar characteristics 2. takes fairness into account by considering the ability of participants to pay
Promote revenue adequacy	<ol style="list-style-type: none"> 1. is designed to cover the intended share of losses over time 2. has access to other sources of funding if accumulated receipts from charges are inadequate 3. has ongoing sources of funding or standing authority to obtain funds that may mitigate revenue shortfalls 4. has a process in place to assess and recommend pricing adjustments as necessary
Limit administrative burden	<ol style="list-style-type: none"> 1. collects charges directly by the program or through a third party 2. has a process in place to ensure funds are properly remitted 3. considers the frequency of collecting charges

Source: GAO analysis. | GAO-17-62

Note: The order in which the characteristics are listed does not indicate level of importance. Also, not all the characteristics may be feasible, desirable, or applicable to a terrorism insurance program.

Economic efficiency. A premium-like charge could address risk and insurable value—characteristics of promoting economic efficiency—but would be difficult to price. Specifically, a premium-like charge could be based on existing premiums that policyholders paid insurers.⁶¹ However, this approach has some limitations because the existing, underlying premiums are not accurately priced according to risk. As we previously discussed, insurers lack data to accurately price terrorism risk insurance and may charge a nominal percentage of the underlying commercial property/casualty premium. Four industry associations, three insurers, an insurance broker, and a state regulator said a reliable method or model to estimate manmade catastrophes like terrorism events is currently not available and representatives questioned how the federal government

⁶¹Under either approach, charges could be collected from the insurers, policyholders, or both.

could set risk-based prices to promote economic efficiency in the absence of a viable method to estimate terrorism risk.⁶²

Taking into account risk mitigation activities—another characteristic of economic efficiency—would be challenging to incorporate into a premium-like charge. Three insurers stated that, due to the unpredictable nature of potential terrorism events, risk-mitigation measures could be more costly than beneficial because terrorists might change tactics in response to mitigation efforts. One of the insurers further noted that mitigation efforts would be less effective at an individual insurer or policyholder level than at a national level, and a state regulator said the federal government is the primary body for taking mitigation actions such as through national security. While mitigation efforts may be difficult to incorporate into the premium pricing process for terrorism risk, an insurer said it takes certain mitigation efforts into consideration when making decisions to accept a client. For example, the insurer said that 24-hour guard service, perimeter fencing, and intrusion detection devices are some mitigation efforts considered in the decision.

In contrast, a backstop charge does not need to be closely tied to an estimate of each participant's terrorism risk exposure or risk-mitigation activities. For example, a backstop charge would only need to cover the cost of its administration rather than potential losses and, therefore, does not need to be risk-based.

Equity. With either a premium-like charge or backstop charge, policymakers may need to consider trade-offs between fairness and affordability. Industry stakeholders noted challenges in structuring a federal charge for terrorism risk to promote the characteristics of equity (fairness), which involve the extent to which the pricing structure (1) provides similar treatment to participants with similar levels of risk, and (2) considers affordability. One insurer stated that to achieve equity, all participants with similar levels of terrorism risk should be charged similar rates. Two other insurers and a state regulator cautioned that prices needed to be affordable to maintain participation rates and support a thriving market that offers coverage for terrorism risk. One insurer pointed

⁶²Unlike natural catastrophes such as hurricanes, humans can alter the frequency and severity of manmade catastrophes such as terrorism. Natural catastrophes occur randomly, lending these catastrophes to traditional methods of modeling that insurers use to help price premiums. Applying traditional modeling methods is more challenging because they lack randomness.

out that affordability is important to consider because it was a factor in the withdrawal of insurers and reinsurers from offering terrorism coverage after the September 11 terrorist attacks.⁶³ One state insurance regulator said an affordability goal could be problematic to the extent it competes with the goal of each participant paying their fair share, and another state regulator said that an equitable charge would be more achievable if collected after a terrorism event—as currently structured under TRIA’s recoupment provision—when more information would be known about the amount of losses.

Revenue adequacy. If policymakers wanted to focus on raising adequate revenue to cover expected losses over time, a premium-like charge might be a better option than a backstop charge. However, some industry stakeholders we interviewed stated that a charge that could generate enough revenue to cover the federal share of losses would be cost-prohibitive. An annual charge would need to be very high to accumulate enough funds over time to cover very large losses which, an insurer surmised, could drive down take-up rates and require other sources of funds, such as surcharges or taxes. Also as discussed, industry associations, insurers and others we interviewed said that determining a price that would provide adequate revenues to pay for the federal share of potential losses would be difficult because estimating terrorism frequency and loss is not possible with any statistical accuracy. In contrast, a backstop charge approach would not be intended to cover expected losses.

Administrative burden. If policymakers focused on reducing administrative burden, a backstop charge might result in lower administrative costs than a premium-like charge. Industry stakeholders generally held similar views that a premium-like charge would bring about higher levels of administrative burden than the current program—that is, the responsibilities of program staff or third parties to collect and process the charge and oversee the effort. Officials from the Congressional Budget Office and the Congressional Research Service cautioned that collecting and managing federal charges from the more than 1,000 commercial property/casualty insurers would entail a large resource

⁶³Similarly, we reported that insurers generally stopped covering terrorism risk after September 11, 2001, because they determined that the risk of loss was unacceptably high relative to the premiums policyholders would view as affordable. See GAO, *Terrorism Insurance: Rising Uninsured Exposure to Attacks Heightens Potential Economic Vulnerabilities*, [GAO-02-472T](#) (Washington, D.C.: Feb. 27, 2002).

commitment from the federal government. According to our interviews, if such a charge was implemented, increases in staff and expertise would be required to collect, manage, and oversee the charges. Officials from Treasury estimated that a program that collected an upfront charge would necessitate an additional 15-20 more full-time staff to collect the charges and audit primary insurers—up from the three staff that would be needed to administer third-party service contracts following a certified terrorism event. The officials said more staff could be needed to operate on an independent board and to manage the collection and investment of the funds. According to one insurer, pricing a federal charge as a flat rate on premiums across all TRIA-eligible insurance lines and including it on policyholders' statements similar to premium taxes would be transparent and easily audited and thus may require less administrative burden than a variable rate. Two insurers emphasized that the current method—recouping the federal share of losses after a terrorism event—is the least burdensome, with relatively low administrative costs to Treasury.

In contrast, under the backstop charge approach, administrative burden may be less than a premium-like charge because staff and operations would not be needed to estimate losses and set a corresponding pricing structure.

Depending on Approach, Implementing Terrorism Set-Asides Could Be Complex

Another alternative funding method for TRIA—designing and implementing an insurer set-aside—could be complex because of existing state laws and insurance accounting standards, among other reasons. An insurer set-aside could be designed to help cover insurers' share of potential terrorism losses, the federal government's share of potential losses, or both. Insurer set-asides could be structured in at least three ways: (1) loss reserves for events that have not yet occurred, (2) separate capital requirements for terrorism risk exposures, or (3) segregated assets that only can be used for a specific purpose such as potential terrorism losses.⁶⁴ We identified four proposals or current programs with

⁶⁴The 2015 reauthorization of TRIA directed GAO to review capital reserves as an alternative approach for funding potential terrorism losses. In response, we assessed set-aside approaches that build on current industry practices through which insurers would more explicitly address their terrorism exposure through their capital, assets, or liabilities, as capital reserves for specific uses do not exist in current industry practices in the United States.

insurer set-aside approaches to illustrate ways a potential set-aside could be designed, according to the three structures (see table 4). These approaches also varied in participation requirements, target amounts, and use of the set-asides.

Table 4: Overview of Four Set-Aside Approaches We Identified

Program name/ proposal	Description	Structure	Participation	Target amounts and time frames	Use
National Association of Insurance Commissioners (NAIC) Catastrophe Reserve Proposal	Property/casualty insurers could set aside funds for potential natural catastrophe losses under proposed tax laws and accounting standards	Loss reserves (tax deduction) without specific segregation of assets	Voluntary	Formula-based annual maximum set-aside amount for each participating insurer Specified industry-wide target and time frame	Insurer share of potential losses Available for multiple perils and solvency purposes
Austria's Terrorism Risk Insurance Program	Allows insurers to set aside funds to cover program deductibles on potential terrorism losses	Loss reserves (tax deduction)	Voluntary	Market share-based set-aside amount for each participating insurer Specified industry-wide target and pace	Insurer share of potential losses ^a
NAIC Catastrophe Risk Weight	When fully implemented, would require insurers to include estimates of potential natural catastrophe losses in their risk-based capital calculations	Included in risk-based capital calculation without specific segregation of assets Will be reported to and assessed by NAIC as part of risk-based capital requirements	Mandatory (when fully implemented)	Amounts determined by individual insurer's risk profile	Available for hurricanes, earthquakes, solvency purposes, and other uses
Selected Aspects from Legislative Proposals for a Terrorism Risk Insurance Act (TRIA) Reserve Fund ^b	Insurers could set aside a portion of their terrorism premiums for potential terrorism losses	Set-aside with segregated assets Must be maintained in segregated accounts in fiduciary capacity on behalf of Secretary of the Treasury	Mandatory (in one proposal)	Specific set-aside amount for individual insurers (in one proposal)	Insurer and federal share of potential losses

Source: GAO interviews and analysis of program documents and legislative proposals. | GAO-17-62

^aBased on available documents and interviews with knowledgeable representatives, it was not clear if the set-asides in the Austrian program and legislative proposals could be used for other perils or solvency purposes. Furthermore, we do not know whether Austria requires specific segregation of assets.

^bWe reviewed two legislative proposals (which were developed by the House Financial Services Committee) entitled the Terrorism Risk Insurance Revision Act of 2005 and Terrorism Risk Insurance Modernization (TRIM) Act of 2014. For the purposes of our report, we combined aspects of both proposals and discuss them collectively. The aspects discussed appear in at least one or both proposals. The proposals also addressed other aspects of the TRIA program. The TRIM Act of 2014 was not widely circulated in Congress because it was never introduced as a bill. The second proposal was introduced in November 2005. (H.R. 4314, 109th Cong. (1st Sess. 2005)). The legislative proposals would direct insurers to hold a portion of their terrorism premiums in fiduciary capacity on behalf of the Department of the Treasury (Treasury). To the extent Treasury used the segregated assets to cover the federal share of terrorism losses, we assumed these assets would not be part of an insurer's taxable income. Although the proposals referenced capital reserves, we interpreted the proposals to require a set-aside with segregated assets as capital reserves for specific uses do not exist in current industry practices in the United States.

The first two ways an insurer set-aside could be structured, establishing (1) loss reserves for events that have not yet occurred and (2) separate capital requirements for terrorism risk exposures, might not involve a formal or legal segregation and limitation of assets dedicated for a particular purpose, as illustrated in the following examples.

- The NAIC catastrophe reserve proposal uses loss reserves for events that have not yet occurred. Under this proposal, a participating insurer's set-aside would be structured as a separate liability on its balance sheet—distinct from loss reserves for events that have already occurred—without specific segregation of assets. In addition, the set-aside could be available to cover losses from multiple types of perils.
- The NAIC catastrophe risk weight uses capital requirements. In 2013, insurers began testing a weighted measure in their minimum risk-based capital determinations, taking into account earthquake and hurricane risks to determine a target amount of capital to maintain that would preserve their solvency following a natural catastrophe.⁶⁵ Insurers' capital is not limited to covering losses from hurricanes and earthquakes.

A third way of structuring an insurer set-aside involves segregation of assets for a specific purpose and is illustrated by proposals by House members to build segregated insurer set-asides for terrorism losses to

⁶⁵According to NAIC officials, they are in the initial data collection and testing phase and expect to fully implement the catastrophe risk weight by 2017.

help stabilize the marketplace following a terrorism event.⁶⁶ Under these proposals, insurers could set aside a portion of terrorism risk premiums collected from policyholders as specifically segregated assets to be used only for potential terrorism losses. We discuss these approaches and examples of set-asides used in other countries in more detail in appendix IV.

Implementing a set-aside for TRIA could be complex. Specifically, a loss reserve similar to NAIC's catastrophe reserve proposal could involve a significant departure from existing insurance statutory accounting standards. Implementing set-asides also could involve revisions of state insurer solvency laws, and federal tax law changes (for example, to provide a tax deduction). In addition, a catastrophe risk-weight approach would involve significant data and model development.

Accounting practices. The four proposals and programs use a range of structures. One approach, in particular, would have implications for current practices related to statutory accounting for insurance losses. Specifically, an approach similar to the NAIC catastrophe reserve proposal—in which insurers would create loss reserves for events that have not yet occurred—would be contrary to the current general basis for recording insurance losses under SAP.⁶⁷ As previously discussed, SAP states that insurers only may create loss reserves for an event that has occurred and for which the cost of the event is estimable. Implementing an approach for potential terrorism losses similar to the NAIC catastrophe reserve proposal would involve NAIC modifications of SAP to allow insurers to maintain loss reserves for events that have not yet occurred.

In addition, using some of the set-aside approaches may affect the total amount of assets that an insurer holds to support its ability to pay current and future claims.

⁶⁶The legislative proposals—which were developed by the House Financial Services Committee and entitled the Terrorism Risk Insurance Revision Act of 2005 and Terrorism Risk Insurance Modernization (TRIM) Act of 2014—also addressed other aspects of the TRIA program. For the purposes of our report, we combined aspects of both proposals and discuss them collectively although some aspects do not appear in both proposals. The TRIM Act of 2014 was a draft outline and was never introduced as a bill. The second proposal was introduced in November 2005. (H.R. 4314, 109th Cong. (1st Sess. 2005)). In addition, we interpreted the proposals to require a set-aside with segregated assets.

⁶⁷Insurers must report their financial holdings to the regulator in their state of domicile using SAP, which measure the ability of an insurer to pay claims and are designed to assist state insurance regulators in overseeing the solvency of insurance companies.

- Under a structure in which insurers would establish loss reserves for events that have not yet occurred (similar to the NAIC catastrophe reserve proposal), an insurer's assets would remain available for all types of insured risks. However, initially establishing such new loss reserves would reduce capital. If, as a result, the insurer's capital would fall below the minimum capital requirements, the insurer would need to raise additional funds to continue to meet capital requirements. However, most U.S. insurers hold several times more capital than states require. If the insurer's capital still exceeded minimum capital requirements even after establishing such new loss reserves, creating a loss reserve for events that have not yet occurred might have no immediate impact on the amount of assets an insurer holds.
- Under a structure that would establish separate capital requirements for terrorism risk exposures similar to NAIC's catastrophe risk weight, an insurer's assets also would remain available for all types of insured risk. If an insurer holds several multiples of the minimum required capital, an additional minimum capital component might have no immediate impact on the amount of capital an insurer holds.
- A structure in which insurers would be required to establish segregated assets that could be used only for a specific purpose such as potential terrorism losses (similar to the legislative proposals) would limit such assets from being used for other types of insured risks. One state regulator and two insurers raised concerns that segregating assets for potential terrorism losses could prevent such assets from being used to pay for other losses. In addition, holding assets that are specifically segregated for terrorism losses may require insurers to raise additional capital. However, if an insurer holds several multiples of the minimum required capital, the segregation of assets might have no immediate impact on the amount of assets the insurer already holds.

State laws. The complexity of implementing set-asides also could include revising state laws to recognize or account for how to treat the assets in the event states needed to oversee and resolve insolvent insurers. For instance, accommodating a set-aside with segregated assets might require amending NAIC's model laws and later adoption and enactment by the states. Furthermore, two state regulators pointed out that implementing a set-aside with segregated assets for potential terrorism losses could affect state oversight related to laws and practices for insurers that become insolvent. For example, the two state regulators pointed out that policymakers should consider if funds in the TRIA set-

aside would become part of state receivership procedures to pay non-TRIA claims of insolvent insurers.

Federal tax laws. Some set-aside approaches also may have implications for federal tax laws. For example, current federal tax rules do not allow insurers to deduct potential losses. However, providing preferential tax treatment for potential terrorism losses—in conjunction with changes to SAP that would allow such reserves—could provide incentives for insurers to establish related loss reserves. Such revisions would need to incorporate limitations to prevent overestimation of potential loss reserves, as an overstatement of loss, if allowed, would improperly decrease the amount of taxable income.

In addition, policymakers also would need to clarify the tax implications related to a set-aside with segregated assets. For example, policymakers would need to clarify whether amounts added to segregated assets would receive favorable tax treatment (such as tax credits or reductions to taxable income).⁶⁸ The two legislative proposals we considered were not clear on the specific amounts available for insurers to use or if any amount contributed to the set-aside would receive favorable tax treatment.

Data and model development. Implementing any of the terrorism set-aside approaches, particularly a risk weight as part of insurers' risk-based capital calculation requirements—similar to NAIC's existing catastrophic risk weight—would require historical and reliable data on terrorism losses. It would also require models to estimate potential losses, which could take several years to develop, test, and implement if data were available. For example, NAIC officials said that detailed property location data and the ability to reasonably model losses helped in the creation of the catastrophe risk weight, a process that took more than 10 years.

Similar types of information would be needed to develop target amounts and time frames for set-asides or a risk weight for terrorism risk. While insurers increasingly have used sophisticated modeling tools to assess terrorism risk, little data exist on which to base estimates of future losses in terms of frequency or severity, or both.⁶⁹ NAIC officials told us that they

⁶⁸We did not explore the tax treatment of income earned by the amounts that were contributed to the set-aside in any of the approaches. This would be another implication to consider.

⁶⁹Insurance Information Institute, *Terrorism Risk and Insurance*, August 2013.

have begun high-level discussions to consider adding a terrorism risk weight and weights for other risks. Although they expect that they could shorten the development time frame because of their experience developing the catastrophe risk weight, such an approach remained a challenge because of the difficulties of measuring and predicting losses associated with terrorism risks.

Both TRIA's Current Funding Structure and Alternative Funding Options Could Adversely Affect the Market, but Some Factors Could Help Mitigate the Effects

TRIA's current recoupment mechanism and alternative funding options could affect affordability and participation for policyholders, the flexibility of the use of insurers' assets, and the exposure and role of the federal government. We examined the potential effects of TRIA's current recoupment provisions and the alternative funding options of a federal charge for terrorism risk insurance and set-aside approaches as follows.

- **Recoupment of federal share of losses (current TRIA structure).** Following a certified terrorism event, Treasury recoups federal losses through premium surcharges on all policyholders with TRIA-eligible insurance line coverage.
- **Federal charge for terrorism risk insurance.** A federal charge on insurers or policyholders structured as either (1) a premium-like charge intended to help pay for the federal share of potential losses and replace the current recoupment provision, or (2) a backstop charge paid to the Treasury for the promise of payment of the federal share of losses with recoupment still in place to cover the federal share of losses.
- **Terrorism set-asides.** Insurers would be permitted or required to establish terrorism set-asides, potentially using one of the different types of set-aside approaches discussed in the previous section: (1) loss reserves for future terrorism losses, without segregating assets (similar to NAIC proposal); (2) separate or additional capital requirements for terrorism risk, without segregating assets (similar to catastrophe risk weight); or (3) segregated assets that could only be

used for terrorism losses (similar to legislative proposals).⁷⁰ We assumed the terrorism set-aside approaches would retain TRIA's recoupment provision, but analyzed set-asides and recoupment independently of each other.

Limitations to Illustrating Potential Effects of TRIA's Recoupment Structure and Alternative Funding Options on Insurance Markets

We present illustrative estimates of potential market impacts that recoupment and a federal terrorism charge could have on the price of TRIA-eligible insurance line coverage, policyholder participation in purchasing TRIA-eligible insurance line coverage, and the volume of TRIA-eligible insurance written. The lack of data on the terrorism risk insurance market and the low frequency of terrorism events (certified or otherwise) relative to other catastrophic events make estimating potential market effects challenging. For example, our analysis of the size of effects was limited by the lack of data on prices and participation rates and uncertainty about insurer and policyholder reactions to recoupment and alternative funding options. As such, our numerical estimates of market effects rely on a number of informed assumptions (see app. I). Also, the results we discuss throughout this objective are based on average elasticity estimates (see app. V for results for the high and low elasticity estimates).⁷¹ Elasticities could be affected by factors such as location of policies.

Our numerical estimates also are necessarily uncertain and speculative. A terrorism event could affect the demand or supply of insurance and thus affect premium rates and insurers' volume of business. Actual market effects likely will differ depending on factors including insurer and policyholder behavior and federal actions for all options, and specifically for recoupment, the timing of the terrorism event, the amount of losses, and the subset of insurers affected. In addition to the potential effects we

⁷⁰Insurers' share of losses would be covered under the approaches used in the NAIC proposal and Austrian program, and both the federal and insurers' shares of losses would be covered under the approach used in the legislative proposals. Although we discussed a terrorism risk weight that would be similar to the catastrophe risk weight earlier in the report, we did not analyze this option because many stakeholders considered the option redundant with the insurers' current practices.

⁷¹Elasticity is the degree to which businesses might purchase less insurance coverage in response to a price increase.

estimated, it is possible there could be no or minimal effects on the price that businesses pay for TRIA-eligible insurance, policyholder participation, or the volume of insurance written, as we note throughout this report. Finally, there are limitations on how the potential effects of the alternative funding options can be compared to the potential effects of recoupment because recoupment would occur only after an event, while the effects of the alternative funding would occur regardless of whether an event occurred.

In this section, we discuss the most significant potential effects of recoupment and the alternative funding options on policyholders, insurers, and the federal government. See appendix V for more information about our analysis and additional results, including effects on reinsurers and state regulators. Generally, the magnitude of potential effects varies for recoupment by the amount of losses caused by the terrorism event, the proportion of losses borne by insurers and the federal government, and the length of the collection period.⁷² The magnitude of potential effects for the alternative funding options varies by the design and the implementation.

Some Options Could Decrease Affordability and Participation, but Longer Time Frames or Broader Application Could Help Mitigate Effects

Decreases in Affordability and Participation

Recoupment surcharges and alternative funding options could increase prices for policyholders; thereby, decreasing affordability and participation rates. According to Treasury's 2016 report, if reporting insurers charged for terrorism risk coverage, they charged between 0.7 percent and 7.1 percent of the total policy premium depending on the TRIA-eligible line of coverage, and the participation rates among policyholders was about 70 percent.⁷³ We estimated potential effects on prices, policyholder participation, and insurers' net premium revenue of (1) recoupment

⁷²In some scenarios, there may be no recoupment.

⁷³See Department of the Treasury, Federal Insurance Office, *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program*, (Washington, D.C.: June 2016).

surcharges or (2) a federal charge in specific scenarios.⁷⁴ We used two potential pricing methods that rely on different assumptions about insurers' pricing strategies in reaction to a recoupment surcharge or federal charge.⁷⁵ Under one method (the percentage load method), we assumed that insurers fully pass through to policyholders a percentage increase in premium rates that may be specified by Treasury or future legislation. Under another method (the revenue target method), we assumed that insurers have the incentive to attempt to increase prices to collect as much additional direct earned premiums as possible up to the annual collection or target amount.⁷⁶ Using these two methods, we estimated price and participation changes that could result from (1) recoupment and (2) a premium-like charge. For example

- For terrorism events that result in mandatory recoupment amounts exceeding \$20 billion, when using the percentage load method, we estimated that recoupment surcharges would increase TRIA-eligible insurance line prices by about 3 percent and could decrease policyholder participation by about 2 percent on average. When using the revenue target method, we estimated that premiums could increase by about 8 percent on average and participation could

⁷⁴Net premium revenue refers to direct earned premiums net of the recoupment surcharge or federal charge for terrorism risk insurance. For recoupment, premium increase estimates would vary with the size of an event, the year in which it took place, the premium bases of the affected insurers, and Treasury's methodology for setting mandatory recoupment. Also, we did not consider variations in the effects of the options on participation rates by location, size of the insurer, industry covered by the insurance, or the extent to which some policyholders may be required to purchase terrorism risk coverage. However, we used a range of elasticities (the degree to which businesses might purchase less insurance coverage in response to a price increase) that may capture some of these differences.

⁷⁵Note that another potential insurer pricing strategy would be to absorb a recoupment surcharge or pre-event charge. Under this pricing strategy, there would be no effect on pricing and therefore no effect on participation.

⁷⁶See appendix I for more information about these two methods.

decrease by about 5 percent on average.⁷⁷ After the recoupment collection period, policyholders could see price decreases.

- Using multiple assumptions, we estimated the effects of a premium-like charge directly imposed only on policyholders with terrorism risk coverage. Specifically, when using the percentage load method, we estimated that terrorism risk insurance prices would increase by about 16 percent and participation on average could decrease by about 10 percent. When using the revenue target method, we estimated that prices on average would need to increase by about 43 percent to collect the target amount, which could result in an average participation decrease of about 27 percent.⁷⁸

Set-aside approaches that result in the need for insurers to raise additional capital to cover other types of insured risks may result in price increases and participation decreases. In particular, the approach in the legislative proposals may result in price increases for two reasons: (1) a portion of insurers' terrorism risk premiums would be shifted to a

⁷⁷In this scenario, a terrorism event in 2019 produces \$40 billion in losses, and the insurers' share would not exceed the aggregate industry retention amount. Some terrorism events could result in no mandatory recoupment, such as events in which insurers would bear all the losses or very large events in which the insurers' share of losses exceeded the industry aggregate retention amount. We used two different methods to estimate some potential effects (beyond the possibility of no or minimal effect) on prices and participation rates. These numbers represent the average results of each method. For more information on our analytical methods and the results, see appendix V. The terrorism risk and TRIA-eligible insurance market reactions may be more uncertain because a terrorism event could affect the demand or supply of insurance, and thus affect premium rates and volume of business. While policyholders' demand for terrorism risk insurance may increase after a terrorism event, demand for TRIA-eligible insurance likely would be less affected. On the supply side, a terrorism event could decrease the availability of TRIA-eligible and terrorism risk coverage because of insurers' reduced capital (due to losses) and a potential upward reassessment of the probability of a future event. However, industry participants have indicated that a terrorism event could increase availability of terrorism risk coverage because as premiums increased, new sources of capital could enter the market.

⁷⁸In this scenario, we estimated the annual charge by using the cost of private reinsurance in the international market as it is sold to nationwide programs and an estimate of the total U.S. direct earned premium from terrorism risk insurance (5 percent of direct earned premiums for TRIA-eligible insurance), and assumed a modest charge for collection. For more information, see appendix V. Note that in this scenario, the effect is much larger because fewer policyholders would be affected (see the mitigating factors discussion). Additionally, using a lower estimate for direct earned premiums from terrorism risk insurance would increase the estimated impact from of a federal charge. These estimates are uncertain and actual effects likely would differ depending on policyholder behavior. For example, declines in participation likely would be constrained due to state or lender requirements to maintain terrorism risk coverage.

segregated asset account that could only be used for potential terrorism losses, and insurers might increase prices if, as a result, they needed to raise additional capital to cover other insured losses; or (2) depending on the size and timing of a terrorism event, some of the segregated assets might be used to pay for some of or all the federal share of losses, so that not all the premiums collected would necessarily be available to cover the insurer's own share of losses.

The potential size of any price increase may depend on such factors as

- the cost of raising any additional capital,
- the perceived likelihood of events resulting in payments towards the federal share of losses,
- the perceived likelihood and timing of any recoupment payments, and
- the perceived likelihood that the federal government would reimburse insurers whose assets contributed to covering the federal share of losses.⁷⁹

Other set-aside approaches that do not require segregation of assets may have a minimal impact, if any, on pricing. An insurer only would pay for its own losses, and its assets would remain available for all types of insured risks. If the insurer already had enough capital to meet required standards, an additional reserve or capital requirement might have no impact on the amount of capital it needed to hold, as discussed earlier.

Price increases from recoupment surcharges or alternative funding options could vary by the extent to which insurers passed costs to policyholders and by insurer size. Two stakeholders stated that insurers likely would pass recoupment surcharges to policyholders, but other stakeholders pointed out that some insurance companies could choose to

⁷⁹The potential change in price due to an approach similar to the legislative proposals cannot be estimated without additional information about factors such as the extent to which insurers' set-asides would be used to cover the federal share of losses and the cost of any additional capital insurers might need to raise. Under the legislative proposals' approach, if Treasury used insurers' set-asides to offset the federal share of losses, Treasury would reimburse the companies for such amounts after the federal share of terrorism losses had been recouped.

absorb the cost to maintain competitive prices.⁸⁰ Stakeholders' opinions varied on whether insurers would pass on the federal charge to policyholders. Treasury officials said that insurers would want to pass the cost of a charge to policyholders, but market forces would dictate the extent to which they could. Another stakeholder said that most insurers likely would absorb the cost of a charge by spreading it across all the lines of business they wrote. This amount could be categorized as a general expense and might not be a significant addition to a premium rate. Additionally, the stakeholder said that the rate increase attributed to this expense likely would be too small to attract state regulators' scrutiny and policyholders would not notice the additional cost. Small insurers might be less able to absorb the cost and, consequently, more likely to pass the cost to their policyholders, according to one stakeholder.

Declines in policyholder participation from recoupment surcharges or alternative funding options could vary by industry and other factors. For example, any reduction in participation among commercial property builders likely would be constrained due to lender requirements to maintain terrorism risk coverage as a condition of financing development projects. Furthermore, state requirements to maintain workers' compensation coverage (from which terrorism risk cannot be excluded) generally could moderate the reductions in policyholder participation.

Mitigating Factors

Our estimates indicated that longer time frames and broader application could help mitigate the potential adverse effects on policyholders of a recoupment surcharge, especially since the 2015 TRIA reauthorization increases the potential amount of funds that the government could collect through mandatory recoupment.⁸¹ Mandatory recoupment deadlines (ranging from 1 year and 9 months to 6 years and 9 months after a terrorism event) were introduced in the 2007 and continued in the 2015

⁸⁰The recoupment surcharge must be paid by the policyholder (unless the cost of collecting the surcharge exceeds the amount, in which case, the insurer may directly pay the surcharge to Treasury). However, some insurers may choose to effectively absorb the federally imposed recoupment surcharge by other policy price reductions to offset the recoupment amount billed.

⁸¹The 2015 TRIA reauthorization increased two mandatory recoupment variables—the aggregate industry retention amount by \$2 billion per year from 2015 to 2019, and the mandatory recoupment scaling factor from 33 percent to 40 percent.

reauthorizations of TRIA.⁸² Longer mandatory recoupment collection periods could result in smaller price increases and impacts on affordability compared to shorter time frames.

Table 5 shows differences that the collection time (determined by the date of an event) can have on the required annual collection amount and the potential increase in premiums following a terrorism event resulting in \$40 billion of losses.⁸³ We estimated that the mandatory recoupment that would follow an event of that size occurring in 2017 could lead to a larger increase in TRIA-eligible commercial property/casualty premiums than an event of equal size occurring in 2019. For example, when using the percentage load method, we estimated prices would increase about 6 percent. When using the revenue target method, we estimated that prices on average could increase about 17 percent.⁸⁴ These estimates are about two times the increase resulting from the case with a longer collection time for an event occurring in 2019.⁸⁵ See appendix V for more information on this analysis.

Table 5: Differences in Mandatory Recoupment Factors Dependent on the Year of Loss for a \$40 Billion Terrorism Event

Factor	Loss occurs in 2017	Loss occurs in 2019
Mandatory recoupment amount ^a (dollar amount)	26.4 billion	30.8 billion
Required time to collect ^b	1 year, 9 months	4 years, 9 months
Annual amount to collect (dollar amount)	13.2 billion	6.2 billion

⁸²These deadlines were developed in response to a Senate rule enforcing a requirement that direct spending or receipts legislation be deficit neutral over certain periods of time. Specifically, the Senate pay-as-you-go, or PAYGO, rule generally requires that any legislation projected to increase direct spending or reduce revenues also must include equivalent amounts of direct spending cuts, revenue increases, or a combination of the two so that the legislation does not increase the on-budget deficit over a 6-year period and an 11-year period. Without such offsetting provisions, the legislation would require the support of at least 60 Senators to waive the rule.

⁸³An event resulting in a \$40 billion loss would be slightly smaller than the September 11, 2001, losses.

⁸⁴Under TRIA, a recoupment surcharge would be assessed on all TRIA-eligible coverage.

⁸⁵These premium increase estimates would vary with both the size of an assumed event and the year in which it took place. Furthermore, any such estimation of potential increases in premiums is subject to significant uncertainty, and actual premium changes could fall outside (above or below) any estimated potential range. Due to the changes in the 2015 TRIA reauthorization, the underlying amount of losses to recoup between 2017 and 2019 increased by about \$4 billion. Therefore, a larger amount would be recouped for the 2019 event with less impact to affordability than for the 2017 event.

Factor	Loss occurs in 2017	Loss occurs in 2019
Potential percentage increase in premiums for TRIA-eligible coverage (increased prices by specified percentage method) ^c	6	3
Potential average percentage increase in premiums for TRIA-eligible coverage (increased prices to collect target amounts method) ^c	17	8

Source: GAO analysis of 15 U.S.C. § 6701 note, and SNL Financial's direct earned premium data. | GAO-17-62

^aAlthough the insurers and event size are the same the mandatory recoupment amount is different because the current Terrorism Risk Insurance Act (TRIA) increases the industry aggregate retention amount by \$2 billion per year between 2015 and 2019. This example assumes the top four insurers incur losses in the event and therefore pay deductibles and co-shares.

^bTo determine the effective time frame, we assumed Treasury would begin collecting the surcharge in January following the event.

^cThese results represent different assumptions about insurance market pricing methodologies in reaction to the mandatory recoupment amount. Additionally, we assumed an average price elasticity of -0.63 for the demand of commercial property/casualty insurance premiums. See appendix I for more information. Any such estimation of potential increases in premiums is subject to significant uncertainty, and actual premium changes could fall outside (above or below) any estimated potential range. Two stakeholders stated that insurers would pass mandatory recoupment surcharges to policyholders, but it is possible the insurers could chose to effectively absorb the recoupment surcharge by reducing the price of other policies to offset recoupment amounts billed.

According to Treasury officials, minimizing disruption to the terrorism risk insurance market and maintaining affordability are key considerations for how they would determine a recoupment surcharge amount under TRIA's mandatory recoupment provision. They said that longer recoupment time frames could give them more flexibility in considering affordability than shorter time frames.

Our analysis also indicated that designing a federal charge for terrorism risk insurance to apply to a broad group of policyholders could mitigate potential price increases.⁸⁶ Specifically, price increases could be significantly smaller if the charge were imposed on insurers that could spread the cost among a wide range of policyholders. For example, if insurers spread the charge among policyholders with TRIA-eligible lines, when using the percentage load methods, we estimated that prices would increase by 0.8 percent, and participation on average could decrease by 0.5 percent. When using the revenue target amount method, we estimated that prices on average could increase by 2.1 percent and

⁸⁶A federal charge for terrorism risk insurance, or insurers' pricing reaction to a federal charge for terrorism risk insurance, could be applied across any of at least three different premium bases: as an addition to all property/casualty premiums; as an addition to just TRIA-eligible premiums; or as an addition to the terrorism risk portion of any premium. We separately modeled each of these three possibilities.

participation on average could decrease by 1.3 percent.⁸⁷ Similarly, if insurers spread the federal charge among policyholders of all property/casualty lines, when using the percentage load method, we estimated prices would increase by 0.3 percent and participation on average could decrease by 0.2 percent. When using the revenue target amount method, we estimated that prices on average could increase by 0.8 percent and participation on average could decrease by 0.5 percent.

These changes were significantly smaller than changes we estimated from a charge imposed on policyholders with terrorism risk coverage. In that scenario, when using the percentage load method, we estimated that terrorism risk coverage prices would increase by about 16 percent, and participation on average could decrease by about 10 percent. When using the revenue target amount method, we estimated that prices on average could increase by 43 percent and participation on average could decrease by 27 percent. See appendix V for more details. Although applying a federal charge to a larger group of policyholders could reduce potential market disruptions by decreasing the impacts on price and participation, it also could create a cross-subsidy and might not be equitable.⁸⁸

Requiring an Insurer Set-Aside for Terrorism Risk Could Hamper Risk Management, but Broadening the Use for Additional Purposes Could Help Mitigate These Effects

Restrictions on Flexibility of Assets

Because restricting the use of assets could hamper risk management, insurers likely would be more affected by the government requiring the type of set-aside involving segregated assets for potential terrorism losses than the other set-aside approaches. Insurers, state regulators, and NAIC officials we interviewed stated they were concerned with requiring segregated assets for potential terrorism losses because the funds might not be available for other types of losses. Industry

⁸⁷Insurance premiums are generally charged only to policyholders purchasing the coverage. However, the recoupment mechanism under TRIA applies post-event charges to policyholders with TRIA-eligible coverage regardless of whether the policyholder carries terrorism risk coverage. The same concept could be applied to a federal charge.

⁸⁸A cross-subsidy could exist in the sense that all property/casualty policyholders would subsidize the subset of policyholders who had purchased terrorism risk coverage.

stakeholders, including insurers, state regulators, and representatives from insurance trade associations, also stated that having the flexibility to use funds for a variety of purposes is an important tool for managing the risks of their various lines of business and related business operations.

If required to be restricted for terrorism losses, assets that otherwise would be available to cover losses from any line of business would be reduced and insurers might need to raise additional capital to meet external requirements or internal assessments of capital adequacy. Insurers, state regulators, and NAIC officials also said that while segregated assets might help ensure solvency following a terrorism event, they could decrease the likelihood of solvency following more common events, such as natural catastrophes, and representatives of an association said that the impact could be greater on insurers with less capital.

Mitigating Factors

The set-aside approaches we reviewed that did not involve segregated assets (loss reserves or risk-based capital requirements for potential terrorism losses) would continue to allow insurer loss reserves or capital to be available to pay claims for other lines of insurance, which could mitigate the potential adverse effects on insurers. For example, under the NAIC proposal for recording reserves for future potential natural catastrophe losses, loss reserves would not be limited to one type of loss. Rather, the reserves would be available to pay claims for any type of catastrophic loss—man-made or natural. Under the NAIC proposal, the reserves also would be available to insurers to pay claims to protect their solvency if needed, subject to certain criteria. Another approach we reviewed—establishing separate capital requirements for terrorism losses—would not limit the use of insurer capital. NAIC has been implementing a similar approach for natural catastrophe risk to better measure an insurer's ability to remain solvent following a catastrophic loss.

All Funding Options Result in Federal Fiscal Exposure and the Alternative Funding Options Could Require Expanding Federal Capabilities

Fiscal Exposure and Mitigating Factors

Recoupment and alternative funding options result in federal fiscal exposure; however, some factors could mitigate the exposure.

- First, the federal government risks significant explicit fiscal exposure after a terrorism event because it is statutorily required to make payments (reimbursements to insurers) if losses exceed insurers' deductibles following a certified event under TRIA.⁸⁹ This exposure exists until the federal share of losses is recouped. However, if Treasury opted not to fully exercise the program's recoupment provisions, an implicit fiscal exposure would remain.⁹⁰ By statute, the federal government must recoup any mandatory portion of losses following a terrorism event but can choose not to recoup any discretionary portion of losses, which represents a fiscal exposure.

Much of the estimated recoupment amounts resulting from larger, catastrophic losses would be considered discretionary under TRIA's provisions, and could exceed \$60 billion. Because the program mandates a 3 percent cap on the increase of premium rates in TRIA-eligible lines for the discretionary portion of recoupment, we estimate that in an extreme case Treasury might need to collect a premium surcharge for as long as 28 years to fully recoup the discretionary portion of losses. The effects of a protracted period of premium surcharges could be a factor in Treasury's determination of whether to pursue discretionary recoupment in such a scenario. In addition, the weakened economic environment that resulted after the September 11, 2001, terrorism events suggests that an event large enough to trigger TRIA likely would result in a weakened economic environment. As such, one insurer questioned whether the federal government would follow through with mandatory or discretionary recoupment. As we previously discussed, mandatory recoupment could lead to large

⁸⁹Explicit fiscal exposures include payments the government is legally required to make either immediately or in the future.

⁹⁰Implicit exposures include implied commitments embedded in the government's current practices or the public's expectations about the role of government.

price increases, especially in shorter collection time frames, which could affect the political will to carry out recoupment.

Our analysis indicates that the program could provide an economic subsidy to the extent that the federal government is not expected to recoup all of its losses. As we explain in appendix VI, we assess the presence of a subsidy on the basis of whether and to what extent the federal government would be expected to recoup its losses, regardless of whether a terrorism event or recoupment occurred.⁹¹ Using various assumptions and taking into account several limitations, we analyzed the potential size of any subsidy by estimating the annual forgone federal terrorism risk insurance premiums. We estimated the annual economic subsidy amount could be as high as \$1.6 billion, if the government were not expected to recoup any of its losses.⁹² However, if the federal government were expected to recoup all of its losses as described in TRIA, the economic subsidy amount would be \$0 (no subsidy). For more information on our subsidy analysis, see appendix VI.

- Second, a premium-like charge also could affect federal fiscal exposure but including a recoupment provision could mitigate such effects. A premium-like charge could reduce federal fiscal exposure if sufficient funds were collected to pay for losses. However, if terrorism

⁹¹The presence and size of a subsidy, as we have defined it for our purposes, does not equate to the fiscal exposure that exists under TRIA. The fiscal exposure, as we have defined it, exists because the federal government is required to make payments (reimbursements to insurers) when losses exceed insurers' deductibles following a certified terrorism event. For the purposes of our report, we generally define an economic subsidy as the full or partial payment (or the full or partial absence of a payment) by the government for an action that benefits private market participants. Under TRIA, the federal government does not charge for its share of potential losses before a terrorism event occurs but may recoup its losses after the event through premium surcharges. Given TRIA's recoupment provisions, we based our subsidy assessment on expectations about the extent to which the government would recoup potential losses. We analyzed the size of any subsidy by estimating forgone premiums to reflect the value of the federal terrorism risk insurance coverage provided under TRIA without knowledge of whether and to what extent claims would occur.

⁹²To determine a potential size for any subsidy, we made assumptions about the likelihood of federal recoupment, the value of insurance coverage, and the private reinsurance market. We estimated forgone premiums using the cost of private reinsurance purchased for other national programs. Rates for this type of reinsurance have been fairly stable across countries and generally ranged from 2 percent to 3 percent of coverage. We used an average cost of coverage of 2.5 percent and assumed that the government annually would purchase coverage for a maximum payout. See appendix VI for a fuller discussion.

losses exceeded funds collected from the charge and no recoupment provision was in place, the federal government would need to cover the difference. For example, it could take many years to accumulate sufficient funds to cover potential losses, and if the federal share of losses from a terrorism event exceeded the collected funds, the financial exposure to the federal government could be higher than under the current program in the absence of recoupment. However, the federal fiscal exposure could be mitigated if recoupment were to remain a part of the program, providing a mechanism by which the federal government could recover losses that exceeded the funds collected from a premium-like charge.

- Third, implementing a premium-like charge could result in increased prices for terrorism risk or TRIA-eligible insurance, which in turn could lead to decreased participation in private insurance and, therefore, fewer private funds available to fund recovery. However, a backstop charge (with recoupment to cover the actual federal share of losses) might result in lower price increases on policyholders and have less effect on affordability and policyholder participation.
- Finally, we found that implementation of some terrorism set-aside approaches likely would have minimal impacts on federal fiscal exposure due to losses and others could increase federal fiscal exposure by allowing deductions for taxes before a terrorism event occurs. Set-aside approaches that do not involve segregated assets might have minimal impact on federal fiscal exposure.⁹³ However, to the extent that a segregated assets approach could be designed to cover the federal share of losses, it could reduce federal fiscal exposure. Additionally, officials from NAIC, Treasury, and state regulators expressed concerns that insurers could overstate any pre-event loss reserves or segregated assets for terrorism risk in an attempt to reduce their tax exposure. This could increase federal fiscal exposure. The overall net impact of a segregated assets approach is unclear.

Expanding the Federal Role

Alternative funding options could represent a major change to the federal role in the terrorism risk market and entail administrative costs. Under the current program, Treasury generally has a passive role in the insurance

⁹³In the event of a certified terrorism event, we assumed the loss-sharing arrangement under the set-aside approaches would be similar to TRIA's current structure in which the government would recoup all or some of its losses through policyholder surcharges.

market but becomes active following a terrorism event. With a federal charge, the government would potentially take on administrative responsibilities (such as collecting and managing funds) before an event occurred. In an April 2016 report on terrorism risk insurance programs in other countries, we found that the costs for carrying out these responsibilities were generally a small percentage of the programs' overall income.⁹⁴ Similarly, the administrative costs to the federal government of implementing a federal charge could be low and funded by the charge collected. A set-aside approach also could involve some administrative costs for data collection. As NAIC officials pointed out, the data required to implement a set-aside requirement—for example, to reliably estimate a set-aside target amount—do not currently exist. In addition, in a segregated assets set-aside approach—which would require insurers to set aside funds that could be used for both their share and the federal share of terrorism losses—the federal government would need to determine the appropriate amount of the segregated assets that would be held for the federal share of losses.⁹⁵

Pricing a premium-like charge could present significant challenges for the federal government, partly because Treasury has limited data on collected terrorism premiums, amounts of coverage, or location of coverage.⁹⁶ In addition, setting an appropriate amount to charge or an appropriate target amount to collect could present significant challenges to Treasury because of the difficulty of estimating the magnitude and frequency of terrorism events. By using data and modeling, other nations' terrorism risk insurance programs have developed methods to address

⁹⁴See [GAO-16-316](#).

⁹⁵In the legislative proposals, insurers would set aside a percentage of their TRIA premiums for terrorism losses. After a terrorism event, affected insurers would use the set-asides to pay their portion of losses as well as any potential federal share. The government would recoup and reimburse the companies that used set-asides to pay the federal portion of losses. Companies without losses could use set-asides to pay their recoupment surcharges.

⁹⁶We previously recommended that Treasury collect and periodically assess data on the terrorism risk insurance market to inform oversight of the program. See [GAO-14-445](#). Treasury has begun collecting data on the terrorism risk insurance market in response to the 2015 TRIA reauthorization and, in June 2016, issued its initial report on the effectiveness of TRIA based on a voluntary data call. Insurers that participated in the voluntary data call represented about 41 percent of the TRIA-eligible market in 2015, according to Treasury's report. See *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (June 2016). In addition, Treasury issued regulations in December 2016 formalizing the procedures for continuous data collection required by the 2015 TRIA reauthorization. The regulations go into effect on January 17, 2017.

limitations related to estimating the frequency and severity of terrorism events.⁹⁷ Specifically, some programs use data on premiums collected, coverage amounts, and location in pricing the charge under their programs. For example, some programs base their charges on the amount of coverage or the terrorism risk premium that is charged by the primary insurers. Such programs also use models with specific terrorism event scenarios and frequencies. Alternatively, a backstop charge might require less data and be less challenging to implement. For example, the United Kingdom Treasury collects a backstop charge to reflect the potential cost of capital, which may present fewer data challenges than collecting a risk-based charge. Specifically, as we found in our April 2016 report on terrorism risk insurance programs in other countries, the program in the United Kingdom annually pays a backstop charge to the United Kingdom Treasury for access to an unlimited line of credit should it be needed to cover policyholder claims. According to a United Kingdom Treasury official, this charge is intended to reflect the potential cost of capital to the government for backing this liability.

Additionally, in pricing a premium-like charge, the government would face decisions about which participants to charge and would need to consider whether the charge was affordable. For example, our analyses indicated that the government would need to charge a larger set of policyholders than those purchasing terrorism risk coverage (similar to its current recoupment methodology) to avoid potentially steep percentage increases in prices. Furthermore, as one stakeholder stated, an affordable federal charge only on policyholders that purchased terrorism risk coverage would not go far in helping the federal government accumulate funds for its share of losses (because of the potential size of the federal share under TRIA). Pricing a premium-like charge that is equitable, and provides adequate revenue could involve trade-offs between participation and covering expected losses.

Agency Comments

We provided a draft of this report for review and comment to Treasury, including the Federal Insurance Office, and NAIC. Treasury and NAIC provided technical comments, which we incorporated as appropriate. In addition, we provided relevant sections to NCCI, selected state programs

⁹⁷See [GAO-16-316](#).

(California Earthquake Authority; Florida Hurricane Catastrophe Fund; and Property/Casualty Insurance Security Fund, New York), and relevant government officials in selected countries (Austria, Australia, Canada, Finland, France, and Mexico) for their technical review. We incorporated technical comments we received from these entities, as appropriate.

We are sending copies of this report to the appropriate congressional committees, Treasury, NAIC, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-8678 or garcia Diaz@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Key contributors to this report are listed in appendix VIII.



Daniel Garcia-Diaz Director, Financial Markets and Community Investment

Appendix I: Objectives, Scope, and Methodology

The objectives of our report were to examine (1) how insurers manage their terrorism risk exposure and price terrorism risk insurance; (2) the federal government's recoupment requirements and how the federal share of terrorism losses would be affected in different scenarios; (3) how alternative funding approaches could be designed and implemented; and (4) the potential effects of the approaches.

Document Review and Interviews

To address these objectives, we reviewed the Terrorism Risk Insurance Act of 2002 (TRIA), Terrorism Risk Insurance Extension Act of 2005, Terrorism Risk Insurance Program Reauthorization Acts of 2007 and 2015, implementing regulations, and congressional records.¹ We also reviewed prior GAO work on this topic.² We interviewed officials from the Department of the Treasury (Treasury), National Association of Insurance Commissioners (NAIC), Congressional Budget Office, and Congressional Research Service and reviewed relevant reports.³ We also interviewed and reviewed reports from academic researchers and several industry participants to obtain information for all our objectives, including insurers, reinsurers, state regulators, representatives from insurance trade

¹Terrorism Risk Insurance Act of 2002, Pub. L. No. 107-297, 116 Stat. 2322 (2002); Terrorism Risk Insurance Extension Act of 2005, Pub. L. No. 109-144, 119 Stat 2660 (2005); Terrorism Risk Insurance Program Reauthorization Act of 2007, Pub. L. No. 110-160, 121 Stat. 1839 (2007); Terrorism Risk Insurance Program Reauthorization Act of 2015, Pub. L. No. 114-1, 129 Stat. 3 (2015); and 31 C.F.R. Part 50.

²GAO, *Terrorism Insurance: Treasury Needs to Collect and Analyze Data to Better Understand Fiscal Exposure and Clarify Guidance*, [GAO-14-445](#) (Washington, D.C.: May 22, 2014), and *Terrorism Risk Insurance: Comparison of Selected Programs in the United States and Foreign Countries*, [GAO-16-316](#) (Washington, D.C.: Apr. 12, 2016).

³Department of the Treasury, Federal Insurance Office, *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (Washington, D.C.: June 2016); President's Working Group on Financial Markets, *The Long-Term Availability and Affordability of Insurance for Terrorism Risk* (Washington, D.C.: April 2014); Congressional Budget Office, *Federal Reinsurance for Terrorism Risk in 2015 and Beyond*, Working Paper 2015-04 (Washington, D.C.: June 2015); and Congressional Research Service, *Terrorism Risk Insurance: Issue Analysis and Overview of Current Program*, R42716 (Washington, D.C.: July 23, 2014).

associations, a rating agency, and insurance and reinsurance brokers.⁴ Specifically, we obtained information from six insurers, four reinsurers, and four state regulators. In all interviews, we asked participants about practices under TRIA's current structure, the feasibility of the alternative funding options, the importance of key pricing objectives and set-aside design factors we identified, and the potential effects on different stakeholders of the alternative funding options and recoupment under the current program. We initially contacted 12 insurers—7 from among the largest U.S. commercial property/casualty insurers in TRIA-eligible lines of business according to SNL Financial's insurance data and 5 additional small and mid-sized insurers recommended by insurance brokers and trade associations.⁵ Due to scheduling challenges and a lack of response from some insurers, we ultimately interviewed 6 insurers, including 4 from among the largest in TRIA-eligible lines. We determined that the information we obtained from these 6 insurers was sufficient for the purposes of our reporting objectives.⁶ To select reinsurers, we reviewed Treasury's 2014 reinsurance report (which listed the top 50 global reinsurers of the reinsurance market) and Marsh and McLennan Companies, Inc.'s (Marsh) 2014 terrorism report (which listed stand-alone property terrorism risk reinsurers and insurers involved in the terrorism

⁴Marsh and McLennan Companies, Inc., *2015 Terrorism Risk Insurance Report* (June 2015) and *2016 Terrorism Risk Insurance Report* (July 2016); Wharton Risk Management and Decision Processes Center, University of Pennsylvania, *TRIA and Beyond: Terrorism Risk Financing in the U.S.* (Philadelphia, Penn.: August 2005); and Erwann Michel-Kerjan, Paul Raschky, and Howard Kunreuther, "Corporate Demand for Insurance: New Evidence from the U.S. Terrorism and Property Markets," *The Journal of Risk and Insurance*, vol. 82, no. 3 (2015).

⁵TRIA-eligible lines are commercial lines of property/casualty insurance, including excess insurance, workers' compensation insurance, and directors' and officers' liability insurance. Subject to certain exceptions, eligible commercial lines also include the following (as listed in NAIC's Exhibit of Premiums and Losses): aircraft (all perils), allied lines, boiler and machinery, commercial multiperil (liability and nonliability), fire, inland marine, ocean marine, other liability, products liability, and workers' compensation. The law excludes personal property/casualty, crop, and private mortgage insurance; commercial automobile, burglary and theft, and professional liability insurance; and health and life insurance. S&P Global Market Intelligence is a leading provider of financial data, news, and analytics. The data sourced in this report is from S&P Global Market Intelligence's SNL Financial database of publicly filed financial and insurance regulatory information, which includes information it purchases from NAIC.

⁶Practices may vary widely among insurers. The six insurers we interviewed included four of the top 10 insurers and represented 17 percent of the market as measured by direct earned premiums in TRIA-eligible lines in 2014.

risk insurance market).⁷ We selected the top 2 reinsurers from each report and obtained suggestions from an industry association. To select state regulators, we identified states that are members of NAIC's Terrorism Insurance Working Group, have cities considered to be at high-risk for terrorism, have top insurers headquartered there, or were recommended by NAIC officials. From these states, we selected California, Illinois, Massachusetts, Rhode Island, and New York. Due to scheduling conflicts, we held interviews with four of the five state regulators, which we determined were sufficient for the purposes of our reporting objectives. Our selections did not represent the views and practices of other insurers, reinsurers, or states not included.

Current Practices

To describe current practices for managing terrorism risk exposure and pricing terrorism risk insurance, we interviewed selected insurers, NAIC and Treasury officials, brokers, and insurance associations about how insurers manage their terrorism risk, determine the terrorism risk premium, what that premium covers, how premiums are managed, and the extent to which insurers maintain funds to cover potential terrorism losses. We also reviewed NAIC guidance on terrorism risk premium disclosures for policyholders and information about insurance accounting standards and applicable insurance company tax laws. To describe how insurers and the federal government would pay for and recoup their share of losses, we reviewed laws and regulations related to how claims would be paid to policyholders and how insurers would be reimbursed for the federal share of losses.

Recoupment

To determine the extent to which the federal government could recoup its share of terrorism losses, we first conducted analyses on how losses would be shared between the federal government and insurers in various

⁷Department of the Treasury, Federal Insurance Office, *The Breadth and Scope of the Global Reinsurance Market and the Critical Role Such Market Plays in Supporting Insurance in the United States* (Washington, D.C.: December 2014); and Marsh and McLennan Companies, Inc., *2014 Terrorism Risk Insurance Report* (April 2014).

scenarios, using insurance market data as described below.⁸ For more information about how the government and insurers would share losses under TRIA, see appendix II. Second, using the program's recoupment structure, we analyzed how the federal share would be apportioned between mandatory and discretionary recoupment in various scenarios.

Federal Charge

To examine methods the federal government could consider if it were to implement a federal charge for terrorism risk, we developed a pricing framework and interviewed industry participants. To develop the pricing framework, we adapted economic principles and concepts from our prior work on assessing user fees, other government-collected funds, and user-based taxes to develop a framework of four pricing objectives (promoting economic efficiency, equity, and revenue adequacy, and limiting administrative burden) and related characteristics.⁹ We reviewed standard insurance pricing principles, such as actuarial standards of practice, but we did not rely on these standards to develop the framework because from a statistical perspective, existing data on terrorism events are not sufficient to meet some of the basic principles of insurance theory. To validate our pricing framework we obtained feedback on the four pricing objectives from stakeholders in the insurance industry, including insurers and reinsurers. We also interviewed insurers and state regulators to gain some insight about the importance and feasibility of the pricing objectives in relation to developing a charge for terrorism risk and the extent to which trade-offs among the objectives might exist.

We also assessed seven selected state and federal catastrophic or insurance programs as well as two foreign terrorism risk insurance programs to observe the implementation of these objectives. The seven state and federal programs were selected to illustrate a range of approaches for structuring and collecting premiums and methods for

⁸Our illustrative, scenario-based analyses are distinctly different than the projections included in the President's Budget for Treasury. This budget includes projections of average annual payments (reimbursements to insurers) which rely on estimates of annual average losses. In contrast, our analyses illustrate the potential reimbursements to insurers that would be required in hypothetical scenarios of terrorism events of different sizes, occurring in specific years, and affecting various numbers of insurers.

⁹See GAO, *Federal User Fees: A Design Guide*, [GAO-08-386SP](#) (Washington, D.C.: May 29, 2008); and *Federal User Fees: Fee Design Options and Implications for Managing Revenue Instability*, [GAO-13-820](#) (Washington, D.C.: Sept. 30, 2013).

managing and ensuring adequate funding is available to cover program costs. They also cover a variety of risks, including natural catastrophes, and have varying types of participants such as borrowers, pensioners or insurance policyholders, and sources of funding. We used publicly available information to make our assessments of the seven programs. We did not use all the programs to illustrate each pricing objective because the information was not publicly available, and some programs offered clearer examples than others. See appendix III for more information about the seven federal and state programs we reviewed. Based on our recent work on national terrorism risk insurance programs, we identified terrorism risk insurance programs in two countries, Australia and the United Kingdom, in which a charge is paid to the government for the benefit of a government backstop.¹⁰ We used documents and interviews from our prior work to observe the implementation of the pricing objectives in the charge component of the programs.

Insurer Set-Asides

To examine approaches the federal government could consider if it were to require or provide incentives for insurers to maintain terrorism set-asides for potential terrorism losses, we reviewed prior GAO work on designing fees and selected programs or proposals to identify key design factors and implementation considerations (such as, accounting practices and state laws) policymakers could consider if they implemented such an approach.¹¹ We selected four proposals or current programs with set-aside approaches that illustrate variation among the design factors. For example, we selected some approaches that require participation and others that are voluntary. In addition, the approaches reflect different structures, including loss reserves (liabilities), insurers' levels of capital, and segregation of assets. We selected

- an NAIC proposal,
- Austria's terrorism risk insurance program,
- a combination of congressional proposals, and
- a catastrophe risk weight approach.

¹⁰See [GAO-16-316](#).

¹¹See [GAO-08-386SP](#) and [GAO-13-820](#). In both reports, we discuss how reserves (set-asides) can be used to manage revenue instability for user fee programs.

Two of the four approaches applied to potential terrorism losses specifically, while the other two were for potential natural catastrophe losses. For the two natural catastrophe set-aside approaches, we consulted with relevant stakeholders about their application to potential terrorism losses, and for our work, found their application to potential terrorism losses appropriate. To describe the practices, laws, and rules the federal government could take into account, we reviewed documentation on the selected approaches and sources describing relevant accounting standards and laws. We also interviewed insurers, reinsurers, and state regulators on the approaches and reviewed documentation on the process for making changes to accounting standards. See appendix IV for more information on the selected proposals and current programs with set-aside approaches. Appendix IV also includes information on selected countries that allow insurers to establish set-asides to cover future losses. The countries were identified for review through external outreach efforts with international entities, literature review, and questionnaire and interview responses.

Potential Effects

To assess the potential effects of recoupment of the federal share of losses, a federal charge for terrorism risk insurance, and terrorism set-asides on policyholders, insurers, the federal government, state regulators, and reinsurers, we interviewed market participants. Additionally, for recoupment and a federal charge, we quantified the potential effects on policyholder price, participation, and insurers' direct earned premiums. We also assessed the extent to which TRIA provides a subsidy and estimated the size of any subsidy. As we describe below, to conduct our analyses, we used U.S. property/casualty insurance market data, estimates of U.S. terrorism risk premiums, information on international reinsurance rates, models from various alternative funding approaches, and economic literature. We also describe inherent uncertainties related to our estimates and the informed assumptions we used in our analyses. See the remainder of this appendix for more details.

Using U.S. insurance market data and industry estimates: To determine the direct earned premiums associated with the TRIA-eligible insurance lines and market share of subsets of insurers (top 4, top 10, top 20, and all) in 2014, we analyzed 2014 insurance data on direct earned premiums from SNL Financial.¹² We used the top 4, top 10, and top 20,

¹²We used SNL Financial's direct earned premium data for 2014 (as of July 14, 2015).

and all TRIA-eligible insurers as proxies to represent different sized premium bases. The direct earned premium associated with the insurers rather than the number of insurers is important because prior year direct earned premium determines the aggregate insurer deductible. For example, the total of direct earned premium for a different subset of insurers' could equal the direct earned premiums of the top 4 insurers. To assess the reliability of SNL Financial's data, we reviewed prior GAO assessments of the data and performed electronic testing. We determined that the data used in this report were sufficiently reliable for the purposes of our reporting objectives. To project the annual change in the size of the TRIA-eligible market from 2015 to 2018, we used estimations of terrorism risk premiums from 2004 through 2013 from A.M. Best. We found the data sufficiently reliable for this purpose. We calculated the annual change to be an increase of 2 percent. To estimate the percentage of TRIA-eligible premiums that was paid for terrorism risk insurance, we used estimates of the percentage of commercial property insurance premiums paid for terrorism risk insurance from Marsh and Treasury. We found the data sufficiently reliable for this purpose. We used peer-reviewed, published information on the price elasticity of corporate demand for insurance that we determined to be reliable and suitable for illustrating potential effects of recoupment and alternative approaches.¹³ Specifically, we used low and high premium elasticity of demand for commercial property/casualty insurance of -0.43, and -0.82 respectively. We calculated average elasticity of -0.63 from the high and low values. We used elasticity of demand for commercial property/casualty insurance rather than for corporate demand for terrorism risk insurance, which ranges from -0.31 to -0.71, because most premium adjustments would be imposed on commercial property/casualty policyholders. Although we did not analyze variations in the effects of the options by location, size of the insurer, industry covered by the insurance, or the extent to which some policyholders might be required to purchase terrorism risk coverage, we used a range of elasticities that may capture some of these differences.

Estimating potential effects of recoupment: To show the potential upper range of effects of recoupment on TRIA-eligible policyholder price and participation, and insurers' direct earned premium after a terrorism event, we estimated effects of (1) a large mandatory recoupment amount,

¹³Elasticity of demand is the degree to which businesses might purchase less insurance coverage in response to a price increase. See Michel-Kerjan, Raschky, and Kunreuther, "Corporate Demand for Insurance," 505–530.

(2) the shortest time frame for collecting the mandatory recoupment amount (which would result in an upper range effect), and (3) a large discretionary recoupment amount (to show the longest collection time frame).

- To illustrate potential effects of a very large mandatory recoupment amount, we used an event resulting in \$40 billion of insured losses under TRIA that occurred in 2019 (year with the maximum industry aggregate retention) that affected a small set of insurers—insurers with a prior-year premium base equal to that of the top four insurers of TRIA-eligible lines (\$49 billion in 2018).
- To maximize potential market effects of a very large mandatory recoupment amount, we used the same event size and group of insurers (direct earned premiums of \$47 billion in 2016), but an event date of 2017 because the effective collection time frame for mandatory recoupment is the shortest (1 year 9 months), assuming collection starts in the January after the event.
- To illustrate potential effects of a very large discretionary recoupment amount, we used an event size of \$100 billion in 2019 affecting insurers with a prior-year premium base equal to that of the top 10 TRIA-eligible insurers—direct earned premium of \$87 billion in 2018.

Estimating potential effects of a federal terrorism risk insurance charge: To estimate the potential effects of a federal charge for terrorism risk insurance on all property/casualty, TRIA-eligible, and terrorism risk policyholder price and participation, and insurers' direct earned premiums, we constructed annual federal charges using (1) reinsurance rates and (2) frequency models.

- We used the amount estimated in our size of subsidy analysis as discussed below to calculate the increase in premium in 2016 for three different policyholder bases (all property/casualty policyholders, with prior-year direct earned premium of \$572 billion in 2015; TRIA-eligible policyholders, with prior-year direct earned premium of \$205 billion in 2015; and policyholders making actual payments for

terrorism risk insurance under TRIA, estimated as 5 percent of TRIA-eligible prior-year direct earned premiums, or \$10 billion in 2015).¹⁴

- We used the maximum total government share of losses and assumed event frequencies of 20, 50, and 100 years to calculate the increase in premium for the three different policyholder bases (all property/casualty, TRIA-eligible, and terrorism risk premiums).

Potential effects of insurer terrorism set-asides: We did not quantify the potential effects of insurers' terrorism set-asides on TRIA-eligible policyholder price and participation, and insurers' direct earned premium, because the approaches we chose were not expected to require significant changes in these measures. We considered the following set-aside approaches:

- The NAIC proposal specifies a set-aside buildup time frame of 20 years, with a targeted accumulation amount of \$40 billion.
- The Austrian program specifies a set-aside build-up time frame of 10 years and a maximum total reserve amount equal to the potential share of losses—an estimated \$35 billion for all U.S. insurers.¹⁵

¹⁴Although data are limited and estimates vary, we determined that using 5 percent of TRIA-eligible premiums as an estimate of terrorism risk premiums is reasonable for the purposes of estimating potential effects of a federal terrorism risk insurance charge. In 2014, we reported that businesses paid no more than approximately 5 percent of their total property premium for terrorism coverage since 2011. See [GAO-14-445](#). We based this estimate on a review of Marsh data, which solely represented its clients and was not representative of the entire market. However, we determined Marsh's data were the most readily available data on pricing at the time of our data collection. See Marsh and McLennan Companies, Inc., *Market Update 2013 Terrorism Risk Insurance Report* (May 2013). For this report, we reviewed Marsh's 2016 report and Treasury's 2016 report on the effectiveness of TRIA, which both used limited data on terrorism risk insurance pricing in 2015. See Marsh and McLennan Companies, Inc., *2016 Terrorism Risk Insurance Report* (July 2016) and *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (June 2016). Based on data obtained from its clients, Marsh reported that businesses paid 4 percent or 5 percent of overall property premiums for terrorism coverage in 2014 and 2015. Based on data obtained from insurers that participated in its voluntary data call (representing about 41 percent of the premiums in TRIA-eligible lines in 2015), Treasury calculated that if an insurer charged for terrorism risk insurance, the cost on average was about 2.6 percent of the total policy premium and the percentage charged varied from 0.7 percent to 7.1 percent, depending on the line of insurance. We determined that 5 percent was a reasonable figure for our purposes because it fell within the range of percentages reported by both Marsh and Treasury. Using a lower estimate, such as Treasury's 2.6 percent would increase the estimated market impact from of a federal charge applied to terrorism risk premiums.

- One of the U.S. legislative proposals directs insurers to annually set aside 50 percent of terrorism risk premiums to cover future losses, but does not specify a reserve buildup time frame or a target reserve amount. We considered target reserve amounts of \$43.6 billion (20 percent of estimated TRIA-eligible premiums in 2018) and \$100 billion (the maximum for the total losses covered under the program).¹⁶

Finally, although TRIA's current recoupment provision would remain in place under the terrorism set-asides option, we assess recoupment and set-asides independently of each other.

Reflecting uncertainties in estimates of potential effects: While we calculated some illustrative estimates of potential market impacts, such numerical estimates are necessarily uncertain and speculative. None of the alternative funding options exist in the United States. Sources of uncertainty are explained below.

- Recoupment has not been tested because the United States has not experienced a terrorism event large enough to have triggered TRIA. Furthermore, the methodology for setting post-event recoupment surcharges would be based on a number of factors and parameters of the specific terrorism event.
- Our analysis is limited by the lack of data on the current insurance market, particularly prices and the participation rate.¹⁷
- The reactions of insurers and policyholders in the TRIA-eligible insurance market to government actions (imposing a recoupment surcharge or a federal charge for terrorism risk insurance or requiring insurers to establish terrorism set-asides) is uncertain.
- We researched and found reliable estimates for elasticity of demand for commercial property/casualty insurance.¹⁸ However, we did not

¹⁵According to the Austrian representative, the Austrian program increased its insurers' deductible (overall target amount) from \$60 million to \$90 million (from €50 million to €75 million) in January 2013. The time frame was increased to 15 years to allow insurers additional time to accumulate increased program deductibles.

¹⁶The legislative proposals entitled the Terrorism Risk Insurance Revision Act of 2005 and the Terrorism Risk Insurance Modernization (TRIM) Act of 2014 would direct insurers to hold a portion of their terrorism premiums in fiduciary capacity on behalf of Treasury. The TRIM Act of 2014 was never introduced as a bill. The second proposal was introduced in November 2005. (H.R. 4314, 109th Cong. (1st sess. 2005)).

¹⁷See [GAO-14-445](#).

research other market dynamics related to insurers' pricing behavior in response to recoupment or an alternative funding requirement, or insurers' underwriting capacity following a terrorism event. We also did not research changes in businesses' need for terrorism risk or property/casualty insurance before or after a terrorism event.

In the case of recoupment, the terrorism risk and TRIA-eligible insurance market reactions may be more uncertain because a terrorism event could affect the demand or supply of insurance, and thus affect premium rates and insurers' volume of business. While policyholders' demand for terrorism risk insurance may increase following a terrorism event, demand for TRIA-eligible insurance likely would be less affected. At the same time, although TRIA requires insurers to make terrorism risk insurance available, a terrorism event could lead to price increases by participating insurers based upon their reassessment of the likelihood of future events, and thus depress demand. Such insurers may be reluctant to devote additional capital to potential terrorism losses. However, industry participants have indicated that a terrorism event could increase the availability of terrorism risk coverage because as premiums increased, new sources of capital could enter the market.

To reflect the uncertainty of the process and outcomes, we used two methods (percentage load method and revenue target method) that rely on different hypothetical assumptions about the insurers' pricing strategies in reaction to recoupment or a federal terrorism risk insurance charge. (See table 6 for a comparison of the methods.)

- **Percentage load method.** We assume that insurers fully pass through to policyholders a percentage increase in premium rates (that is, the load) based on the annual collection or target amount and insurers' aggregate direct earned premium. For example, if the annual collection amount resulted in a 3 percent recoupment surcharge on premium rates, we assumed that insurers fully would pass through that percentage increase to policyholders and raise premium rates (by 3 percent). This method would result in larger effects than the revenue target method in the form of insurer loss of direct earned premium.
- **Revenue target method.** We assume that insurers have the incentive and would attempt to increase prices to collect, at the margin, as

¹⁸We used the price elasticities of demand for commercial property/casualty insurance rather than terrorism risk insurance because, in general, the cost would be recovered from or imposed on all policyholders of TRIA-eligible lines of business whether or not they carry terrorism risk coverage.

much additional direct earned premiums as possible up to the annual collection or target amount. Such price increases would be above and beyond a full pass through to make up for some or all of the loss of net revenue resulting from decreased policyholder participation in reaction to the price increase. For example, if Treasury annually recouped \$6 billion from insurers, we assumed insurers would raise prices to collect, at the margin, an additional \$6 billion in direct earned premiums. This method would result in larger effects than the percentage load method in the form of premium increases and decreases in participation rates.

Generally, our analyses using the revenue target resulted in a larger impact for policyholders in terms of prices and participation, while the percentage load analysis resulted in a larger impact for insurers in terms of impact on direct earned premiums.

Table 6: Two Insurer Pricing Methods for Illustration of Potential Effects of Price Increases

Percentage load method	Revenue target method
Premium rates increase by a percentage load based on the annual collection amount or target amount and the insurers' aggregate direct earned premium.	Insurers increase premium rates to collect, at the margin, as much additional annual direct earned premiums as possible up to the annual collection or target amount.
The annual target amount collected is generally specified by the scenario. ^a	Same
We calculated the percentage increase in price by dividing the annual target amount needed by the insurers' aggregate direct earned premium. In the first year, we assumed the insurers would increase premiums by the percentage, and make no subsequent increases.	We calculated the percentage increase in price as the ratio of the percentage change in direct earned premiums (from the target amount collected) to one plus the price elasticity. ^b In the first year, we assumed insurers would increase premiums by the percentage and make no subsequent increases.
We calculated the percentage decrease in the participation as the product of the percentage increase in price and price elasticity. ^b	We calculated the percentage decrease in participation as the difference between the percentage increase in insurers' direct earned premium and the percentage increase in price.
We calculated the new gross direct earned premiums as the product of (1) the original direct earned premium, (2) one plus the percentage increase in price, and (3) one plus the percentage decrease in participation.	Same
The actual amount collected is calculated as the product of the percentage increase in price and the new gross direct earned premiums.	The actual amount collected is the same as the target amount described above.
Finally, we calculate the percentage change in insurers' direct earned premium as the ratio of the new gross direct earned premiums (less the actual amount collected) to the original direct earned premiums minus one, as insurers pay the government amounts from their new direct earned premiums. ^c	same

Percentage load method	Revenue target method
<p>For example, consider the mandatory recoupment analysis in 2019. At the beginning of year 1, insurers' direct earned premium from TRIA-eligible lines is \$218 billion and the annual federal recoupment amount is \$6.2 billion for 5 years (for a total recoupment amount of \$31 billion).</p>	<p>same</p>
<p>Insurers pass through the 2.84 percent price increase to TRIA-eligible policyholders (\$218 billion divided by \$6.2 billion). Assuming an average elasticity of -0.63, we estimated a 1.8 percent decrease in TRIA-eligible participation. Accounting for these changes, we estimated the new gross direct earned premiums would be \$220.2 billion. The federal government would collect 2.84 percent of that amount, or a collection amount of \$6.3 billion.^d After the \$6.3 billion was subtracted from the new gross direct earned premiums, the new TRIA-eligible direct earned premiums, net of the surcharge, would be \$213.9 billion, representing a 1.9 percent decrease in insurer's TRIA-eligible direct earned premiums.</p>	<p>The target collection amount of \$6.2 billion represents 2.84 percent of the \$218 billion, which we assumed insurers would attempt to collect from TRIA-eligible policyholders. Using an elasticity of -0.63, we estimated a 7.7 percent increase in price, and a 4.8 percent decrease in participation for TRIA-eligible policyholders. Accounting for these changes, we estimated the new gross direct earned premiums to be \$223.4 billion. After the \$6.2 billion was subtracted from the new gross direct earned premiums, the new TRIA-eligible direct earned premiums net of the surcharge would be \$217.2 billion, representing a 0.4 percent decrease in insurers' TRIA-eligible direct earned premiums.</p>

Legend: TRIA = Terrorism Risk Insurance Act
 Source: GAO analysis. | GAO-17-62

^aAnnual target amount is defined by the scenario. For mandatory recoupment the annual target amount is the total recoupment amount divided by the mandated number of years to collect. For discretionary recoupment, it is the amount that can be collected based on the mandated maximum increase in price for discretionary recoupment (3 percent). For the federal charge, it is the annual charge amount. Additionally, for discretionary recoupment, we calculated the length of time to collect the target amount as the ratio of the total discretionary recoupment amount to the annual target amount.

^bThe extent to which insurers can increase prices will depend on their ability and incentive to do so. For convenience, we assumed that ability and incentive were reflected in the average price elasticity—percentage change in participation to the percentage change in price—that we assumed on average to be -0.63.

^cWe assumed that funds collected for the recoupment or the federal charge were not invested to earn a return.

^dThe amount collected is slightly larger than the required amount because the collection is based on the new larger gross direct earned premiums.

Assumptions related to analyses of potential effects: Due to the prospective nature of this analysis, we made a number of assumptions.

- When necessary, we assumed market reactions to the changes in insurers' prices due to recoupment or alternative funding options, such as the sensitivity of participation in TRIA-eligible insurance to price changes (price elasticity) and the pricing behavior of insurers.

- For all options, we assumed prices would increase.¹⁹
- For each step in our analysis, we assumed that only the variables of interest changed, and all other variables remained constant during the collection or build-up period. For example, for recoupment we ignored other dynamics that could occur in the TRIA-eligible insurance market due to a terrorism event such as policyholders or insurers exiting or entering the market and price changes not directly related to terrorism risk.
- We assumed that a terrorism event or an additional terrorism event would not occur during the collection or build-up period.
- We assumed that insurers' actions primarily would be to collect the federal recoupment surcharges or charge for terrorism risk insurance.
- In all cases, we used SNL Financial's direct earned premium data to determine the size of the property/casualty insurance market and submarkets (see app. II for further details). We assumed that the baseline annual total direct earned premiums for commercial property/casualty insurance and the market share of subsets of insurers remained unchanged for the implementation period and after a terrorism event during the recoupment period.
- We assumed that the current average price elasticity of -0.63 remained constant over the range of price increases considered.²⁰
- We assumed insurers would impose any increase in the first year of the collection or build-up period and obtain the annual cost from the increase in direct earned premiums. In the second and the remaining years of the collection or build-up period, we assumed insurers would not adjust prices further since the annual cost would remain constant,

¹⁹Although our analyses assumed price increases, it is also possible that there could be no change in pricing if the government were to impose a federal terrorism risk insurance charge. Under recoupment there would likely be a change in pricing because the recoupment surcharge must be paid by the policyholder (unless the cost of collecting the surcharge exceeds the amount, in which case, the insurer may directly pay the surcharge to Treasury). However, some insurers may choose to effectively absorb the federally imposed charge by other policy price reductions to gain a competitive advantage.

²⁰For the sensitivity analysis, we estimated low and high percentage changes in price, participation, and insurers' direct earned premium using the minimum and maximum estimates of the price elasticity of corporate demand for property insurance.

and insurers would collect the same new direct earned premiums as in the first year.²¹

Assessing the presence and size of a subsidy: To evaluate the extent to which insurers and policyholders receive an economic subsidy under TRIA, we reviewed and synthesized literature on government subsidies taking into account the program's recoupment feature. We determined that a subsidy exists in the program to the extent that the federal government is not expected to recoup all its losses. To estimate the potential annual size of the subsidy, we estimated forgone federal premiums for the federal share of losses. Because we could not determine premiums using an actuarial method, we used reinsurance rates paid by other national terrorism risk insurance programs. We were told by the broker of many reinsurance deals in other national terrorism risk insurance programs that the rates were fairly stable across countries and generally ranged from 2 percent to 3 percent of the amount of coverage. We use a rate-on-line (the ratio of premium paid to loss recoverable in a reinsurance contract) of 2.5 percent of reinsurance coverage purchased, assumed the federal government purchased coverage for its maximum annual losses under TRIA, and added 5 percent as a collection fee. We performed calculations in scenarios in which the government is expected to (1) recoup neither mandatory nor discretionary recoupment amounts, and (2) only recoup mandatory amounts. Specifically, to determine the maximum annual losses under TRIA, we used SNL Financial's insurance market data as described above and modeled the maximum terrorism event size (\$100 billion in insured losses) in 2016 and assumed insurers with an aggregate premium base equal to the top 20 insurers were affected by the event. We estimated the portion of federal losses that would be subject to mandatory and discretionary recoupment. To estimate the forgone federal premium amount, we multiplied the maximum federal loss amount by the reinsurance rate. For more information on our subsidy analysis including limitations and assumptions, see appendix VI.

We conducted this performance audit from January 2015 to January 2017, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for

²¹Alternatively, in some methodological approaches, insurers could increase prices gradually to reach the required level but this would increase the length of the collection or build-up period. In other methodological approaches, the annual amount or time period is fixed.

our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: Estimating the Government Share of Losses under the TRIA Program

Under the Terrorism Risk Insurance Act (TRIA), the federal government and insurers potentially share losses from a certified terrorism event if total losses exceed the program trigger (\$120 million in 2016) and losses exceed any individual insurer's deductible.¹

- Each insurer's share of losses is the minimum of its actual losses or the sum of its deductible (measured as 20 percent of its previous year's direct earned premium in TRIA-eligible lines) and its co-share portion (16 percent of losses exceeding the deductible amount in 2016).² Assuming an insurer has satisfied its deductible, its losses are capped in the event the program cap (\$100 billion) for all losses (insurers and federal) has been reached.
- The federal share of losses is the difference between the total losses (or the \$100 billion program cap, if smaller) and the sum of insurers' losses.³

Some recent program changes shift a greater share of losses from the federal government to insurance companies over time, such as changes to the program trigger and the insurer co-share.

To illustrate a range of potential terrorism loss scenarios for insurers and the federal government, we analyzed terrorism events affecting insurers with aggregate premium bases equal to the top 4, top 10, top 20, and all

¹The Secretary of the Treasury, in consultation with the Secretary of Homeland Security and the Attorney General of the United States, determines whether an event should be certified as an act of terrorism, based on certain criteria. Without a certified act of terrorism, TRIA is not activated. Insurers incur all losses and the government incurs no losses if insured losses due to a certified terrorism event do not exceed the program trigger.

²TRIA-eligible lines are commercial lines of property/casualty insurance, including excess insurance, workers' compensation insurance, and directors' and officers' liability insurance. Subject to certain exceptions, eligible commercial lines also include the following (as listed in the Exhibit of Premiums and Losses of the National Association of Insurance Commissioners): aircraft (all perils), allied lines, boiler and machinery, commercial multiperil (liability and nonliability), fire, inland marine, ocean marine, other liability, products liability, and workers' compensation. The law excludes personal property/casualty, crop, and private mortgage insurance; commercial automobile, burglary and theft, and professional liability insurance; and health and life insurance.

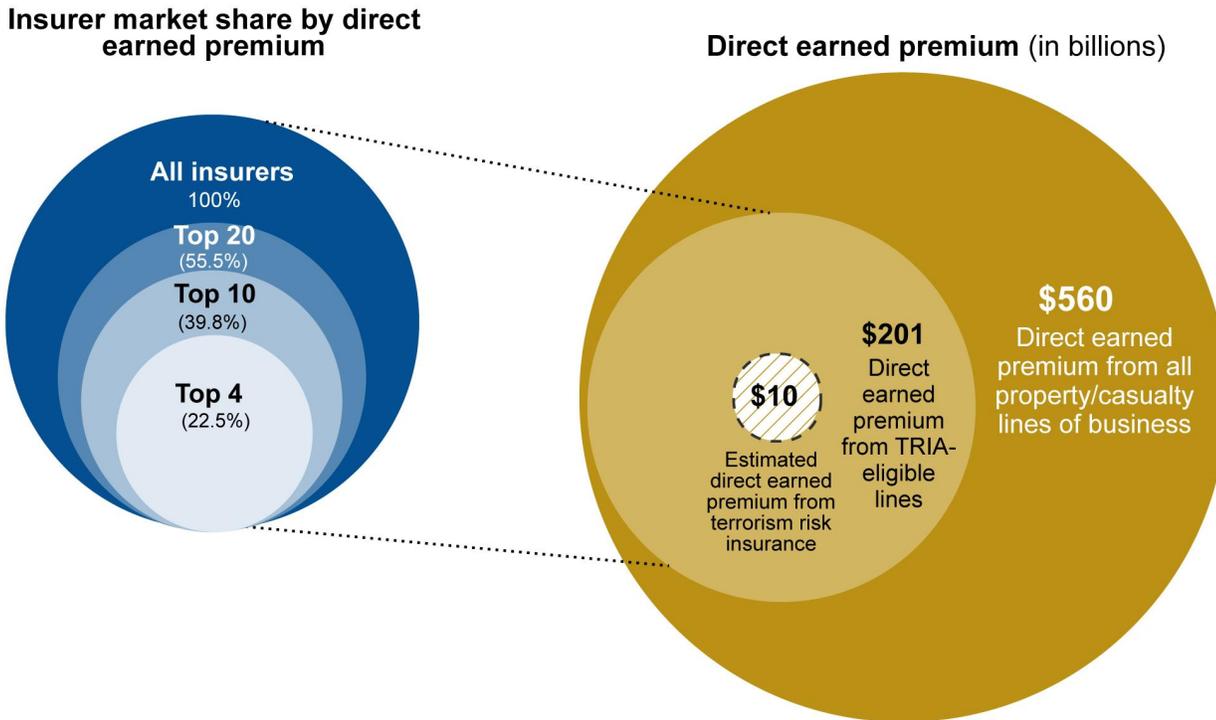
³To the extent insurers' losses do not exceed the aggregate industry retention amount, any federal losses are subject to mandatory recoupment.

insurers with TRIA-eligible lines of insurance.⁴ Using SNL Financial's data, we determined the direct earned premiums and market share earned by the top 4, top 10, top 20, and all insurers in 2014 in TRIA-eligible lines of business. As figure 7 shows, insurers earned \$201 billion in direct earned premiums for TRIA-eligible lines in 2014, according to SNL Financial's data, and the four insurers with the most direct earned premiums from TRIA-eligible lines of insurance earned 22.5 percent of such premiums.⁵

⁴The direct earned premium associated with the insurers rather than the number of insurers is important because direct earned premium determines the aggregate insurer deductible. We used the top 4, top 10, and top 20, and all TRIA-eligible insurers as proxies to represent various sized premium bases. For example, the total of direct earned premium for a different subset of insurers' could equal the direct earned premiums of the top 4 insurers.

⁵We assume a 2 percent annual increase in direct earned premium for subsequent years based on A.M. Best's annual estimates of terrorism risk revenue from 2004 through 2013.

Figure 7: Direct Earned Premiums from Categories of Property/Casualty Lines of Business and Insurer Market Share, 2014



Legend: TRIA = Terrorism Risk Insurance Act

Source: GAO analysis of SNL Financial's insurer direct earned premium data. | GAO-17-62

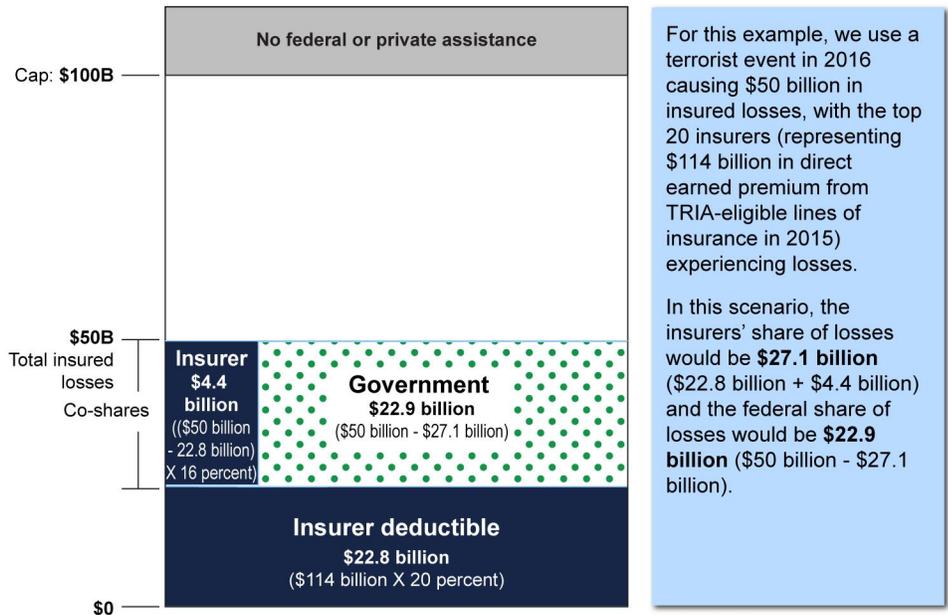
Notes: Although data are limited and estimates vary, we determined that using 5 percent of TRIA-eligible premiums as an estimate of terrorism risk premiums is reasonable. In 2014, we reported that businesses paid no more than approximately 5 percent of their total property premium for terrorism coverage since 2011. See GAO, *Terrorism Insurance: Treasury Needs to Collect and Analyze Data to Better Understand Fiscal Exposure and Clarify Guidance*, GAO-14-445 (Washington, D.C.: May 22, 2014). We based this finding on a review of Marsh data. See Marsh and McLennan Companies, Inc., *Market Update: 2013 Terrorism Risk Insurance Report* (May 2013). For this report, we reviewed Marsh's 2016 report and Treasury's 2016 report on the effectiveness of Terrorism Risk Insurance Act (TRIA), which both used limited data on terrorism risk insurance pricing in 2015. See Marsh and McLennan Companies, Inc., *2016 Terrorism Risk Insurance Report* (July 2016) and Department of the Treasury, Federal Insurance Office, *Report on the Overall Effectiveness of the Terrorism Risk Insurance Program* (Washington, D.C.: June 2016). Based on data obtained from its clients, Marsh reported that businesses paid 4 percent or 5 percent of overall property premiums for terrorism coverage in 2014 and 2015. Based on the data it received from insurers that participated in its voluntary data call (representing about 41 percent of the premiums in TRIA-eligible lines in 2015), Treasury calculated that if an insurer charged for terrorism risk insurance, the cost on average was about 2.6 percent of the total policy premium and ranged from 0.7 percent to 7.1 percent of the policy premium depending on the line of insurance. We determined that 5 percent was a reasonable figure for our purposes because it fell within the range of percentages reported by both Marsh and Treasury. We estimated the total direct earned premiums for terrorism risk coverage to be \$10 billion (5 percent of \$201 billion in direct earned premiums for TRIA-eligible lines in 2014). Using a lower percentage, such as Treasury's 2.6 percent would decrease this estimated total direct earned premium for terrorism risk coverage.

Using these subsets of insurers, we estimated the insurer and federal shares of terrorism losses under single-event scenarios, varying by size of event (losses of \$5 billion, \$25 billion, \$40 billion, \$50 billion, \$75 billion, and \$100 billion) and year of event (from 2016 to 2019). We estimated the insurer deductible for each insurer group by multiplying their direct earned premium by 20 percent.⁶ If the insurers' deductible was greater than or equal to the loss total, there was no insurer co-share and no federal share. If the insurers' deductible was less than the loss total, we estimated the insurers' co-share by subtracting the insurers' deductible from the loss total and multiplying the result by the insurers' co-share percentage. The estimated federal share of losses is the difference between the total loss and the insurers' share.⁷ Figure 8 illustrates an example of loss sharing under TRIA.

⁶For our analyses in cases where total losses exceeded the insurers' deductible, we assumed that each affected insurer's losses exceeded 20 percent of its prior year direct earned premium. Insurers that do not experience losses that exceed 20 percent of such premium are responsible for all losses and do not share losses with the federal government.

⁷The federal share is the co-share portion not paid by insurers. For example, in 2016 the federal portion of the co-share was 84 percent of the remaining losses after insurers' deductibles.

Figure 8: Example of Loss Sharing under TRIA



Source: GAO analysis of Terrorism Risk Insurance Act (TRIA) using SNL Financial's direct earned premium data. | GAO-17-62

Note: In this scenario, the federal share of losses apportioned to mandatory recoupment would be \$4.4 billion (industry aggregate retention amount in 2016 minus insurers' share of losses, or \$31.5 billion minus \$27.1 billion) and to discretionary recoupment would be \$18.5 billion (total losses minus insurer losses minus portion of federal share subject to mandatory recoupment, or \$50 billion minus \$27.1 billion minus \$4.4 billion). Some numbers may not sum to totals due to rounding.

The relative size of the federal share of losses depends on the amount of insured losses from the terrorism event and the direct earned premium of insurers affected, as shown in table 7. The federal share of losses would be greater in events with more insured losses. For example, in the scenarios in which affected insurers had an aggregate premium base equal to that of the top 20 insurers, the federal share of losses would increase from \$1.9 billion in the case of an event with \$25 billion in losses to \$64.9 billion in an event with \$100 billion in losses. This shows that the government plays a greater role in more catastrophic events, consistent with the manner in which the program is structured. Additionally, the share of losses the government sustains depends on the aggregate TRIA-eligible direct earned premium of the insurers with losses. Specifically, the federal share of losses is smaller when losses are shared among insurers with larger aggregate premium bases. For example, in a \$25 billion loss scenario, the government share of losses would be \$13.2 billion if the affected insurers had a premium base equal to that of the top 4 insurers and \$1.9 billion if the affected insurers had a premium base equal to that of the top 20 insurers.

Appendix II: Estimating the Government Share of Losses under the TRIA Program

Table 7: Estimated Federal Share of Losses for Different Sizes of Terrorism Events and Subsets of Insurers with Losses in 2016 (dollars in billions)

Subset of insurers with losses ^a (numbers)	Insured losses from the terrorism event (dollars in billions)			
	25	50	75	100
Top 4 insurers	13.2	34.2	55.2	76.2
Top 10 insurers	7.3	28.3	49.3	70.3
Top 20 insurers	1.9	22.9	43.9	64.9
All insurers	0	7.5	28.5	49.5

Source: GAO analysis of 15 U.S.C. § 6701 note, and SNL Financial's insurer direct earned premium data. | GAO-17-62.

^aThe direct earned premium associated with the insurers rather than the number of insurers is important because such premiums determine their deductible amount. We used the top 4, top 10, and top 20, and all TRIA-eligible insurers as proxies to represent various sized premium bases. For example, the total of direct earned premium for a different subset of insurers' could equal the direct earned premiums of the top 4 insurers.

Appendix III: Information on Pricing Structure of Selected State and Federal Insurance or Insurance-like Programs

The tables in this appendix provide general information on select state and federal insurance or insurance-like programs that address the risks of natural catastrophes and severe financial conditions, such as earthquakes and home foreclosures, respectively.¹ These programs illustrate a variety of approaches for pricing and managing federal charges that could provide insight on how a charge for terrorism risk insurance could be designed. For example, policymakers could consider how aspects of these programs' participation requirements, inputs used in setting charges, additional funding mechanisms, and oversight could apply to a federal charge for terrorism risk insurance. Selected programs are described below.

- **California Earthquake Authority:** A public entity that manages the privately funded program and operates as a primary insurer to provide catastrophe earthquake insurance to residential property owners and renters through participating insurance companies. Participating insurers must offer earthquake insurance to their residential property insurance policyholders such as those with homeowners/fire insurance. Some of the fund's risk is ceded through reinsurance, which is financed through direct purchase of reinsurance or through capital markets using a special purpose reinsurance entity specifically designed to purchase reinsurance. Insurers apply to participate in the California program and must submit data for computer modeling to determine the insurer's potential earthquake loss. Newly participating insurers with higher risk than other insurers of similar size may be charged an annual surcharge if the exposures they present to the Authority are higher than the normal risks of the Authority before they can participate in the program. Each year, this situation is examined and the surcharge is dismissed when the exposures of the new participating insurer closely match that of the normal Authority exposure base.
- **Federal Crop Insurance Corporation:** This program was first authorized in 1938 to alleviate the economic distress caused by crop failures during the Dust Bowl era. The program helps farmers manage the risks inherent in farming by allowing them to insure against losses caused by poor crop yields, declines in prices, or both. Farmers can insure against losses on more than 100 crops, including the five major

¹We obtained the information from publically available sources and did not evaluate the performance of these programs. Also, for these tables, we refer to the federal and state governments and other entities that operate and oversee the programs and their funds as "programs."

crops of corn, soybeans, wheat, cotton, and grain sorghum. Approved private insurance companies share a percentage of the risk of loss and opportunity for gain on each policy. The federal government encourages farmer participation by subsidizing premiums and is the primary reinsurer to approved insurers.

- **Florida Hurricane Catastrophe Fund:** A tax- exempt trust fund created by the State of Florida to ensure ongoing reinsurance capacity to insurers for catastrophic wind losses from hurricanes and foster an affordable wind insurance market in Florida. Under this program, insurers pay premiums and are reimbursed for a portion of their losses.
- **Mutual Mortgage Insurance Fund:** Title II of the National Housing Act, enacted in 1934, authorized a single family mortgage insurance program and established the Mutual Mortgage Insurance (MMI) Fund to fund it. The program allows single-family homes to be purchased with small down payments and long-term mortgages. The Federal Housing Administration (FHA), through the MMI Fund, insures lenders against loss from defaulted loans. The Fund is funded primarily through premiums paid by borrowers and the proceeds of foreclosed homes. FHA's single-family mortgage insurance program has provided mortgage credit to families of low and moderate income not adequately served by the conventional private mortgage market.
- **National Flood Insurance Program:** The program makes federally backed flood insurance available to property owners in communities that participate in the program. Communities participate by adopting and enforcing floodplain management regulations designed to prevent and mitigate the effects of flooding. The Federal Emergency Management Agency, an agency of the Department of Homeland Security, administers this program.
- **Pension Benefit Guaranty Corporation:** As a wholly-owned government corporation established to insure the pension benefits of participants in and beneficiaries of private-sector defined benefit plans, the corporation operates a single-employer program and a multi-employer program. Under both programs, plan sponsors pay per-participant flat premiums. In addition, under the single-employer program, a plan sponsor pays a variable rate premium based on its plan underfunding.
- **Property/Casualty Insurance Security Fund, New York:** This fund receives premiums from insurers doing business in New York, based on each insurer's direct written premiums on policies it writes. This fund pays certain insurance claims of insolvent insurance companies

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when such payments are allowed in accordance with New York Insurance Law. The payments are subject to policy limits and a statutory cap. The superintendent of New York's Department of Financial Services is the administrator of the fund.

Table 8 provides information about the type of individual or business entity that participates in each program, whether participation in the program is mandatory, and briefly describes the benefit payment transaction.

Table 8: Information on Participation in Seven Selected Programs

Name of program/fund	California Earthquake Authority	Federal Crop Insurance Corporation	Florida Hurricane Catastrophe Fund	Mutual Mortgage Insurance Fund	National Flood Insurance Program	Pension Benefit Guaranty Fund	Property/Casualty Insurance Security Fund, State of New York
Participant type	Residential property owners who have homeowner/fire policies with participating insurance companies ^a	Crop producer	Property/casualty insurance companies writing many lines of residential insurance	Buyers of single-family homes who borrow funds to buy the homes	Residential and commercial property owners	Private-sector defined benefit pension plans	Property/casualty insurance companies ^b

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Name of program/fund	California Earthquake Authority	Federal Crop Insurance Corporation	Florida Hurricane Catastrophe Fund	Mutual Mortgage Insurance Fund	National Flood Insurance Program	Pension Benefit Guaranty Fund	Property/Casualty Insurance Security Fund, State of New York
Mandatory participation	Residential property owner- No Insurance company – Yes, participating insurance companies must offer earthquake insurance to their homeowner/fire insurance policyholders written through the California Earthquake Authority. —No, non-participating insurance companies may not offer earthquake insurance through the California Earthquake Authority ^c	No	Yes	No	Property owners not in designated special flood hazard areas – No Property owners in designated special flood hazard areas – Yes ^d	Yes	Yes
Benefit payment transaction	Participating insurer processes payment to policyholder for covered losses. Program compensates insurers for claims paid to policyholders and a set of expense to cover their process expenses.	Approved insurers pay crop producers for covered losses.	Program pays insurer for covered losses in excess of insurer's retention amount, up to limits based on calculations involving the insurer's share of premiums paid for that year.	Program pays the lender the outstanding balance of the borrower's loan upon default.	Approved insurers pay policyholder for covered losses. Program reimburses insurer for claims paid.	Program generally insures defined benefit plan pensions subject to statutory maximums.	Fund pays allowed claims of insolvent insurers that cannot meet the policy obligations.

Source: GAO review of program documents. | GAO-17-62.

^aThis program is for residential properties and property/casualty insurers selling earthquake coverage in the State of California.

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^bThis includes fire insurance, miscellaneous property insurance, water damage insurance, burglary and theft insurance, collision insurance, personal injury liability insurance, property damage liability insurance, fidelity and surety insurance, and motor vehicle and aircraft physical damage insurance. This program applies to policies insuring property or risks located or resident in the State of New York.

^cThe California Earthquake Authority statute has provisions for an associate participating insurer, which contains characteristics of a participating and a nonparticipating insurer. Cal. Ins. Code § 10089.16.

^dProperty owners in areas at high risk for flooding generally are subject to a mandatory purchase requirement and must retain flood insurance for the life of their mortgage loans.

Table 9 briefly describes upfront charges, other upfront funding sources, and post-event funding sources for each program and statutory appropriation requirements. Information on these charges includes general information on the key inputs used in setting the level of or structuring the charge. The table also presents various statutory funding mechanisms. Although this table provides primary revenue sources, it is not intended to be an exhaustive list of each program's revenue sources.

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Table 9: Highlights of Funding Sources for Seven Selected Programs

Name of program/fund	California Earthquake Authority Fund	Federal Crop Insurance Corporation	Florida Hurricane Catastrophe Fund	Mutual Mortgage Insurance Fund	National Flood Insurance Program	Pension Benefit Guaranty Corporation	Property/Casualty Insurance Security Fund (State of New York)
Up-front charges	Property owner pays premium to program based, in part, on earthquake risk, such as location in proximity to a fault; and geological and construction factors. Insurer contributes capital to the program fund based on its market share by direct earthquake premiums upon joining the fund. The fund must, among other requirements, have reached a target for participation for authority to operate.	Crop producer pays subsidized premium to approved insurers. The premium rate is based, in part, on crop type, yield history, past losses, and farming practice. The subsidy rates vary by the amount of coverage purchased.	Insurance company pays a premium to the program, based, in part, on geographical area, construction type, and a factor to build up cash in the fund.	Borrower pays an up-front premium, calculated as a percentage of the original loan amount and annual premiums, calculated as a percentage of the outstanding loan amount, to the program.	Property owner pays premium to approved insurer based, in part, on flood risk, program expenses and certain property characteristics. Some property owners pay subsidized premiums. Policyholders pay a flat fee surcharge.	Single employer pension plans pay premiums based on a flat fee for each participant. For each that is underfunded, an additional variable rate premium is charged based on the amount of its unfunded vested benefits. Multiemployer plan sponsors pay a flat fee annually for each plan participant.	Contributions to the fund are based on the insurer's net direct written premiums on policies that insure property or risks in the State of New York. If the superintendent determines the net value of the fund has at least \$150 million at the end of the fund year, no further contributions shall be made the following fund year.
Other up-front funding source	Reinsurance Issue bonds	No	Reinsurance Pre-event bonds	Permanent and indefinite budget authority to draw funds from Treasury in the event that a secondary reserve account has insufficient funds. ^a	No	No	No

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Name of program/fund	California Earthquake Authority Fund	Federal Crop Insurance Corporation	Florida Hurricane Catastrophe Fund	Mutual Mortgage Insurance Fund	National Flood Insurance Program	Pension Benefit Guaranty Corporation	Property/Casualty Insurance Security Fund (State of New York)
Post-event funding source	Program can assess insurers, issue bonds and impose policyholder surcharges.	No	Program can issue revenue bonds that are repaid, in part, with emergency assessments on almost all property casualty insurers in Florida—including those not already participating in the program. ^b	No	Federal Emergency Management Agency has borrowing authority from Department of the Treasury (Treasury), which is intended for use if there is not enough to cover insured claims.	Assets of single employer plans the program has taken over, and amounts recovered from assets of such plans. Also, Investment income on its trust funds.	If the fund falls below the statutory minimum, the program seeks additional funding from the insurers.
Statutory appropriation requirements ^c	No	Authority to expend necessary funds to, among other things, pay premium subsidies and administrative and operating expenses of the approved insurers.	No	Permanent and indefinite budget authority to draw funds from Treasury in the event that a secondary reserve account has insufficient funds. ^a	Authority to borrow from Treasury when losses exceed premium revenue and any accumulated surplus.	This program receives no funds through the annual appropriation process.	Annual statutory appropriation and encumbrance of \$90 million unless not appropriated, then the amount would be up to the amount transferred by the fund to the state general fund.

Source: GAO review of program documents. | GAO-17-62.

^aThe Mutual Mortgage Insurance Fund has two reserve accounts: a primary reserve account to cover expected future losses and a secondary reserve account to cover additional, unexpected future losses.

^bThe program's fund is structured as a state trust fund and thus exempt from federal income tax. The structure enables the program fund to accumulate funds tax free, reducing the amount of post-event financing needed.

^cA statutory appropriation requirement may also be listed as an up-front or post-event funding source.

Table 10 provides examples of who—program staff or third parties—perform the day-to-day operations of key functions and oversight for each program. The table highlights certain large activity components such as issuing policies, collecting premiums, and servicing policies and is not intended to provide an exhaustive list of all operational activities. The

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table also provides information about the oversight approach each program uses to help ensure its participants report accurate information and pay the correct charges. Finally, the table also highlights the reviews or assessments each program performs to determine the adequacy of its charges and the financial viability of its fund.

Table 10: Highlights of Operations and Oversight Functions for Seven Selected Programs

Name of program/fund	California Earthquake Authority Fund	Federal Crop Insurance Corporation	Florida Hurricane Catastrophe Fund	Mutual Mortgage Insurance Fund	National Flood Insurance Program	Pension Benefit Guaranty Fund	Property/Casualty Insurance Security Fund (State of New York)
Examples of day-to-day functions	<p>Program issues policies. Insurers service policies. The program compensates insurers for claims paid to policyholders and services performed. Program is authorized to use third parties for services such as actuarial and geological expertise.</p>	<p>Approved insurers sell and service policies, such as adjusting claims and paying covered losses.</p>	<p>Program, among other things, issues reimbursement contracts, and reimburses participating insurers for losses. Program uses a third party to develop a formula for reimbursement premium rates.</p>	<p>Program collects premiums from borrowers.</p>	<p>Federal government manages the National Flood Insurance Fund and oversees approved private insurers. The insurers sell and service policies, such as by underwriting, adjusting claims, and paying covered losses. Program relies on contractors to collect data, market the program, and help map flood hazards.</p>	<p>Program collects premiums, pays benefits, or provides financial assistance, and tests plan sponsor compliance. Premium rates are set as provided by statute.</p>	<p>Keeps accounting of fund levels, audits insurers' fillings for compliance with payment requirements and takes enforcement actions.</p>

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Name of program/fund	California Earthquake Authority Fund	Federal Crop Insurance Corporation	Florida Hurricane Catastrophe Fund	Mutual Mortgage Insurance Fund	National Flood Insurance Program	Pension Benefit Guaranty Fund	Property/Casualty Insurance Security Fund (State of New York)
Oversight of participant compliance	<p>Program's books and accounts are subject to audit by independent auditors chosen by the State of California's Department of Finance and approved by the California Insurance Commissioner or an inspection by the Department of Insurance.</p> <p>Program has general enforcement and disciplinary authority to ensure compliance with the program's regulatory provisions.</p>	<p>Program can examine records of insurance company for compliance.</p>	<p>Program conducts routine examinations of participants of limited scope to verify compliance with data reporting requirements.</p>	<p>Program can audit lenders.</p>	<p>Program can review insurer activities such as claims and underwriting and performs financial audits every 2 years.</p>	<p>Program can review plan records, which includes verifying the accuracy of reported information.</p>	<p>Audits insurers' filings for compliance with payment requirements.</p>
Oversight of pre-event charges or fund's financial viability	<p>Models are used to calculate the program's claims paying capacity each year. The capacity is subject to approval annually by the Authority's Governing Board comprising the state's governor, treasurer, and insurance commissioner.</p>	<p>Review rate setting methodology periodically.</p>	<p>Statutory requirement, each year, to estimate various loss severity scenarios and provide financing options for each scenario, among other things.</p>	<p>Statutory requirement for actuarial review of fund each year.</p>	<p>Program conducts annual review of its underwriting experience as part of assessing the fiscal soundness of its rating and coverage structure.^a</p>	<p>Actuarial evaluations each year to provide estimates of the two program's future financial condition.^b</p>	<p>Not applicable. Fund uses statutory minimum fund levels to initiate additional payments from insurers.</p>

Source: GAO review of program documents. | GAO-17-62.

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^aGAO has recommended that the Federal Emergency Management Agency (FEMA) ensure that its rate-setting methods for the National Flood Insurance Program result in rates that accurately reflect flood risks. See GAO, *Flood Insurance: FEMA's Rate-Setting Process Warrants Attention*, [GAO-09-012](#) (Washington, D.C.: Oct. 31, 2008). In addition, the program has been on GAO's high-risk list since 2006. See GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: February 2013).

^bThe Pension Benefit Guaranty Fund does not have the authority to set its own premiums, which are set as provided by statute.

Appendix IV: Accounting Practices and Some Domestic and International Set-Aside Approaches

This appendix provides an overview of U.S. insurance accounting practices, in-depth information about identified domestic approaches, and examples of set-aside approaches used in other countries.

The current U.S. insurance accounting standards (statutory accounting principles, or SAP) permit insurers to establish loss reserves only after an event has occurred and U.S. insurers have the flexibility to manage their capital to cover unexpected or catastrophic losses across all lines of business. Although, insurers may consider terrorism risk exposure in their assessments of the adequacy of capital, they do not segregate assets that are restricted for potential terrorism losses or establish loss reserves for events that have not yet occurred.

- **Loss reserve.** For this report, we define a loss reserve as the company's estimate of amounts needed to cover indemnity payments that will come due on policies already written for losses from events that have already occurred and the administrative expenses of dealing with the associated claims. Loss expenses related to increases in loss reserves reduce an insurer's taxable income. Such liabilities are typically the largest single liability on an insurer's balance sheet.
- **Capital.** For this report, we define capital as the excess of an insurance company's assets above its liabilities. Capital generally is not segregated for specific purposes. It provides a cushion to an insurer against insolvency for any unexpected or underestimated losses. For example, if the recorded loss reserves are insufficient, the insurer's capital is available to pay claims. Insurers are generally free to manage their capital as long as they satisfy external solvency and liquidity requirements and internal assessments of capital adequacy. Insurers may also use their capital to expand their business.
- **Accounting standards and financial reporting.** Insurers must report their financial holdings on an individual legal entity basis to the regulator in their state of domicile, using statutory accounting principles of the National Association of Insurance Commissioners (NAIC). According to NAIC, SAP are designed to assist state insurance departments in the regulation of the solvency of insurance companies. The ultimate objective of solvency regulation is to ensure that policyholder, contract holder, and other legal obligations are met when they come due and that companies maintain capital and surplus at all times and in such forms as required by statute to provide a margin of safety. In addition to SAP, insurance groups may issue audited financial statements using U.S. generally accepted accounting principles (GAAP), which in the United States are promulgated by the Financial Accounting Standards Board and are designed to provide

decision-useful information to investors and other users of financial reporting.¹ SAP stress the measurement of ability to pay claims in the future. SAP and GAAP recognize certain items differently and therefore may result in different capital and net income amounts. Accounting standards for recording insurance liabilities state that insurers only may create a loss reserve for a covered event that has occurred and for which the cost of the event is estimable.² No liability exists without the occurrence of a covered event. Unless otherwise noted, references in this report to accounting for or recording liabilities refer to SAP.

- **Tax deduction.** Federal tax laws allow tax deductions for an increase to loss reserves that result from incurred losses for events that occurred during the period.³
- **Risk-based capital requirements.** State regulators require insurance companies to maintain specific levels of capital to continue to conduct business. Regulators determine the minimum amount of capital appropriate for an insurer to support its overall business operations, taking into consideration its size and risk profile. All state regulators have adopted NAIC's Risk-Based Capital for Insurers Model Act and also use formulas that NAIC has developed to establish a minimum capital requirement based on the types of risks to which a company is exposed. NAIC has separate models for different lines of insurance.
- **Assets.** For this report, we define assets to represent the resources that contribute to an entity's future net cash flow and that an entity might use to pay its debts. Insurers' assets are available for potential covered losses and generally are not segregated or restricted for limited uses. But in some instances, an insurer's assets may be segregated or restricted for specific purposes. For example, insurers

¹In the United States, the Financial Accounting Standards Board establishes GAAP, which governs the preparation of financial statements by nongovernmental entities. The International Accounting Standards Board issues International Financial Reporting Standards for foreign non-governmental entities. Neither standard allows liabilities to be included on financial statements for events that have not yet occurred, because they do not meet the definition of a liability.

²Statement of Statutory Accounting Principles no. 55 establishes the principles for recording liabilities for paid and unpaid losses and loss adjustment expenses for property casualty companies. See also Financial Accounting Standards Board Accounting Standards Codification 450-20 and 944.

³26 U.S.C. §832(b)(5) and (c)(4); 26 C.F.R. § 1.832-4(b). In general, insurers may deduct the discounted value of estimated losses that have been incurred and they will be required to pay under insurance policies currently in force.

may segregate or restrict their assets for specific purposes such as holding assets for collateral.

- **Liabilities.** For this report, we define liabilities as present obligations to transfer assets or provide services to other entities in the future as a result of past transactions or events.

Details on Selected Domestic Set-Aside Approaches

For further details on the domestic approaches described in the report, see the following.

NAIC catastrophe reserve proposal. According to a study on the NAIC catastrophe reserve proposal, the proposal's design includes voluntary participation, a specific formula for an insurer to calculate its annual set-aside amount to cover catastrophic losses, and a loss reserve structure for catastrophic events that have not yet occurred.⁴ The proposal was developed to address constraints faced by insurance companies when catastrophes occur and pose significant challenges to the economy.⁵ Under the proposal, a reserve cap for each participating insurer would be calculated with a formula based on each insurer's net written premiums written on qualifying business lines. Each insurer participating on a voluntary basis would determine the amount to set aside each year in a catastrophe reserve over a 20-year time frame. The proposal would establish a target amount of \$40 billion across the property/casualty insurance industry, which was based on written premiums in 1999. Individual companies' contributions would occur over a 20-year period.

Each participating insurer's set-aside would be structured as a separate liability on its balance sheet (distinct from other loss reserves and

⁴Kay A. Cleary and Judy Pool Boutchee, "Reserving for Catastrophes," at <https://www.casact.org/pubs/forum/02fforum/02ff025.pdf>

⁵The proposal was finalized by the NAIC membership in 2001, but a number of actions would have been needed for it to have been implemented and used by insurance companies, including changes to the federal tax code to allow the categorization of the contributions to these set-asides as tax deductible, according to the proposal. In addition, the proposal recognizes that current SAP and GAAP accounting limits the recognition of loss reserves to events that have already occurred. Under the proposal, insurers would be allowed to establish loss reserves for potential catastrophic losses.

unearned premium reserves) without specific segregation of assets.⁶ The proposed federal tax treatment would provide for tax deductions over a period of 20 years for contributions into the set-aside.

According to the proposal, an insurer could use its reserve to cover its share of losses for multiple perils, among other uses. The reserve would be used primarily for catastrophic losses resulting from multiple perils such as wind, hail, or earthquake—and the drawdowns would be subject to criteria designed to protect solvency and limit use of the reserve for only catastrophic losses. Insurers also could use the reserve when the reserve balance exceeded the reserve cap or if their domiciliary state commissioners required them to release the catastrophe reserve as a rehabilitation, conservation, or liquidation measure or to forestall insolvency.

Catastrophe risk weight. In 2013, NAIC began testing a catastrophe risk weight (a weighted measure included in assessments of the adequacy of insurers' capital) to better measure an individual insurer's ability to remain solvent, when taking into account the insurer's earthquake and hurricane risk exposures.⁷ When fully implemented, the catastrophe risk weight will be incorporated into an insurer's risk-based capital requirements, and will have no limitations on its use. All insurers will include an estimate of their hurricane and earthquake exposure as part of their risk-based capital calculations. The catastrophe risk weight was developed from historical data on catastrophe losses. An insurer enters its individually calculated modeled losses into a formula to determine a target amount of capital to maintain against these two exposures.

However, the company's available capital is not limited to covering losses from hurricanes and earthquakes and could be used for any purpose, such as paying claims for other types of catastrophic losses. Hurricane and earthquake risks were included as part of the catastrophe risk weight because they were the two perils most likely to cause losses that could significantly affect an insurer's solvency and the models for these risks

⁶In general, an unearned premium reserve is an account that contains accrued premiums that have not been earned because they are for coverage to be provided in the future. Loss reserves generally are the amounts that the company expects to pay out to cover (1) indemnity payments that will come due on policies already written for events that have already occurred and (2) the administrative expenses of dealing with associated claims.

⁷According to NAIC officials, they are in the initial data collection and testing phase and expect to fully implement the catastrophe risk weight by 2017.

were considered advanced enough to estimate the effect of such losses on insurers' business. NAIC officials leading this effort also told us that they plan to consider similar risk-based capital weights for other risks, including for terrorism.

Selected aspects of legislative proposals. Two proposals by House members that we reviewed included provisions to establish set-asides with segregated insurer assets for terrorism losses to help stabilize the marketplace following a terrorist event.⁸ Key aspects of one or both of the proposals included (1) requiring insurers that sold terrorism coverage to participate, (2) providing for a specific target annual contribution (a percentage of the premiums collected from policyholders for terrorism coverage to be set aside), and (3) specifying the use of funds for insurer and federal shares of terrorism losses. Each insurer participating in the Terrorism Risk Insurance Act (TRIA) program could establish and maintain a set-aside with segregated assets for terrorism losses (the TRIA Reserve Fund) in fiduciary capacity on behalf of the Secretary of the Treasury.⁹

Other aspects of one or both proposals provide additional details on the structure of a set-aside. Specifically, each year an insurer would place 50 percent of the premiums collected from policyholders for terrorism coverage in a set-aside with segregated assets. The set-aside would be maintained in a segregated account, be held by the insurer on behalf of the Secretary of the Treasury, and kept until the program terminated. Therefore, the premium income diverted to this set-aside likely would not be part of an insurer's taxable income, according to an insurer we interviewed. Funds in these set-asides would be collected and used by the Secretary of Treasury to offset the federal share of compensation provided to any affected insurers under TRIA in the event of a certified terrorism event, except that insurers could use these funds first to pay for any of their own covered terrorism losses (including losses below TRIA's

⁸The legislative proposals—which were developed by the House Financial Services Committee and entitled the Terrorism Risk Insurance Revision Act of 2005 and Terrorism Risk Insurance Modernization (TRIM) Act of 2014—also addressed other aspects of the TRIA program. For the purposes of our report, we combined aspects of both proposals and discuss them collectively. The aspects discussed appear in at least one or both proposals. The Terrorism Risk Insurance Revision Act of 2005 was introduced in November 2005. (H.R. 4314, 109th Cong. (1st Sess. 2005)). The TRIM Act of 2014 was a draft outline and was never introduced as a bill.

⁹We interpreted the proposals to require a set-aside with segregated assets.

program trigger level). If the Department of the Treasury (Treasury) used insurers' set-asides to offset any of the federal share of losses, Treasury would reimburse the companies for such amounts after the federal share of terrorism losses had been recouped.

Examples of Set-Aside Approaches Used in Other Countries

We identified some countries in which insurers are allowed to establish set-asides for events that have not yet occurred, although the use, participation, and structures of set-asides differed among some of these countries (see fig. 9). Generally, the set-asides could be available for multiple perils and solvency purposes, and three of the selected countries explicitly allowed insurers to recognize potential terrorism losses. In addition, four of the selected countries mandated insurer participation to establish set-asides, two allowed for voluntary participation, and one country had mandatory and voluntary set-asides. The structures of set-asides took distinct forms such as loss reserves and specific risk-based capital requirements, and some provide a tax deduction for the increases to such set-asides.¹⁰ We discuss the identified international set-aside approaches for events that have not yet occurred on the following pages.¹¹

¹⁰Equalization reserves are intended to cover random fluctuations of claim expenses for some types of insurance contracts, such as hail insurance, using a formula based on multiyear claims experience. They also can be tax deductible.

¹¹We examined some of the national terrorism risk insurance programs in a recently issued report. See GAO, *Terrorism Risk Insurance: Comparison of Selected Programs in the United States and Foreign Countries*, [GAO-16-316](#) (Washington, D.C.: Apr. 12, 2016). However, the focus in this appendix is at the insurer level as opposed to the national level in the prior report.

Figure 9: Overview of Insurer Set-Asides Identified in Six Countries

	Australia	Austria	Canada ^a	Finland	France	Mexico
Structure						
<i>Loss reserve^b</i>	<input type="radio"/>	<input checked="" type="checkbox"/>				
<i>Risk-based capital weight</i>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<i>Tax deduction</i>	<input type="radio"/>	<input checked="" type="checkbox"/>				
Use						
<i>Natural catastrophe</i>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<i>Terrorism</i>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>
Participation						
<i>Mandatory</i>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>
<i>Voluntary</i>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="radio"/>	<input checked="" type="checkbox"/>	<input type="radio"/>

Source: GAO analysis of related documents and interviews with knowledgeable representatives. | GAO-17-62

^aCanadian insurance companies' mandatory risk weights account for earthquake, nuclear, and mortgage risks. For this table, we included its earthquake risk weight and earthquake loss reserve.

^bA loss reserve structure for events that have not yet occurred also includes an equalization reserve structure. Equalization reserves are intended to cover random fluctuations of claim expenses for some types of insurance contracts such as hail insurance, using a formula based on multilayer claims experience. They also can be tax deductible.

Australia. Australian insurers must establish a mandatory set-aside, generally structured as a specific risk weight in capital requirements. It is intended to help insurers to maintain adequate capital against the risks associated with insurance concentration in their activities, including natural catastrophe risks. Natural catastrophes can include all natural events, including earthquakes and storms. This insurance risk weight represents the net financial impact on the insurer from either a single large event or a series of smaller events, within a 1-year period. The risk weight takes into account all possible perils in all regions to determine the size of loss that could occur from a single event. The insurer must retain at least this calculated target amount of capital for all these risks, including natural catastrophes, at all times.

Austria. Austria's Terrorism Risk Insurance Program design includes voluntary insurer participation and loss reserve structure with specified insurer target amounts equal to their deductibles. The set-aside in this

program was established for potential terrorism losses, according to the Austrian program representative. It is unknown whether the set-aside may be used for other purposes such as solvency.

Participating insurers would structure the set-aside as a loss reserve to cover their program deductible on terrorism losses. The reserve is structured as a loss reserve in which the amount that is contributed to the set-aside reduces an insurer's taxable income, according to a program representative.¹² This set-aside would help to cover potential terrorism losses and the target amounts are based on each insurer's market share of terrorism coverage, according to the program representative. Initially, the reserves were accumulated over 10 years. The time frame was increased to 15 years to allow insurers additional time to accumulate increased program deductibles.¹³

Canada. According to insurance regulatory officials, Canadian insurance companies must include mandatory set-asides for specific risk exposures as part of minimum capital requirements and also have the option to establish a voluntary set-aside in capital for earthquake events that have not yet occurred. The mandatory capital set-asides account for potential losses from earthquake, nuclear, and mortgage risks in risk-based capital requirements. The Canadian insurance regulator provides guidance for an insurer to determine the supervisory target level of required capital for each risk (risk weights) that would be included as part of an insurer's risk-based capital requirements. The supervisory capital target for earthquake risk is calculated based on a 500 year probable maximum loss. In addition, for potential earthquake losses, insurers also may participate in establishing a voluntary set-aside in capital. Officials said that this voluntary set-aside is not typically used by insurers for various reasons

¹²Austria's government has no additional financial or administrative role in the program (beyond allowing insurers' contributions to the loss reserve to be deducted from taxable income). The program is run by an insurance association. In addition to the deductibles, insurers collectively purchase reinsurance above the deductible amount.

¹³According to the Austrian representative, the Austrian program increased its insurers' deductible (overall target amount) from \$60 million to \$90 million (€50 million to €75 million) in January 2013. The representative told us this action decreased the amount of reinsurance the pool needed to purchase, which decreased the cost to the pool members but required the insurers to hold larger reserve accounts at their institutions. The members have until 2018 to increase their reserve accounts. The individual insurers contribute to the overall cost of the reinsurance and maintain the reserve account on their balance sheets to pay for claims. All members pay a share of the reinsurance premium based on their market share of terrorism coverage.

including the fact that it locks-in capital that may otherwise be used elsewhere. Officials also told us that assets are not specifically segregated in either the mandatory or voluntary set-asides and that the voluntary set-asides provide a deduction for income tax purposes.

Finland. According to insurance department representatives, nonlife insurers in Finland must establish set-asides structured as equalization reserves—a type of loss reserve—that serves as a buffer for exceptionally high claims. These mandatory insurers' equalization reserves can cover events that have not yet occurred, including losses from natural catastrophes and terrorism. The calculations of target amounts and contributions to such equalization reserves are based on European Union capital requirements. The equalization reserve also has a maximum amount, which can be up to four times the target amount. Representatives also told us that the set-aside is not subject to tax on an ongoing basis but may be subject to income taxes as the set-aside is decreased.

France. According to French insurance regulatory officials, insurance companies in France may establish set-asides generally structured as equalization reserves to cover events that have not yet occurred, including natural disasters and terrorism. Insurers establish equalization reserves on a voluntary basis that allow for tax deduction by the French Tax Administration, but these reserves are not allowed to be included on financial statements prepared under international accounting standards because the event has not occurred, according to officials. Insurers benefit from a tax deduction to reduce an insurer's taxable income for contributions to these set-asides if certain standards are met, such as not exceeding a target amount set by the French Tax Administration. The target amount and time frames depend on the risk that the equalization reserve is meant to cover. For example, an equalization reserve that includes terrorism risk can be kept for 12 years.

Mexico. According to a representative from the insurance regulator, insurers in Mexico are required to establish set-asides for catastrophic events that have not yet occurred and structure these set-asides as special catastrophe reserves to cover natural catastrophe risks as well as other catastrophe risks. Insurers create the catastrophe reserves with a target amount based on probable maximum loss that is calculated at the end of each fiscal year. In addition, insurers record these set-asides as loss reserves on the balance sheet and contributions to these set-asides are tax deductible. Once a catastrophic event occurs, insurers must first

**Appendix IV: Accounting Practices and Some
Domestic and International Set-Aside
Approaches**

exhaust their reinsurance options before utilizing their own catastrophic set-asides.

Appendix V: Additional Potential Effects of Recoupment and Alternative Funding Options

In this appendix, we discuss additional details about our methodology and results regarding how recoupment under the Terrorism Risk Insurance Act (TRIA) and alternative funding options could affect market participants. As noted previously, while our analyses of potential market effects of TRIA recoupment and alternative funding options rely on assumptions regarding price increases under each option, it is also possible that there could be no change in price, policyholder participation, or insurers' volume of premium. In addition, we discuss additional information we obtained from our interviews with industry participants such as insurers and state regulators.

Additional Potential Effects of Recoupment under TRIA Following a Terrorism Event

We estimated the potential upper ranges of effects of recoupment on TRIA-eligible policyholder price and participation, and insurers' direct earned premium after a terrorism event, under scenarios that result in the very large mandatory and discretionary recoupment amounts.¹

Specifically, we estimated effects of (1) a very large mandatory recoupment amount, (2) the shortest time frame for collecting the mandatory recoupment amount (which would result in a very large annual surcharge), and (3) a very large discretionary recoupment amount (to show a very long collection time frame). See table 11 for a summary of the results.

- To illustrate potential effects of a very large mandatory recoupment amount we used an event size of \$40 billion that occurs in the year 2019 (year with the maximum industry aggregate retention) that affected a small set of insurers—insurers with aggregate prior-year direct earned premium equal to those of the top four TRIA-eligible

¹Under TRIA's recoupment provision, the federal government recoups some or all of its losses through insurer enforced premiums surcharges on all policyholders with TRIA-eligible insurance coverage after an event occurs.

insurers.² Using SNL Financial's 2014 data, the top four insurers of TRIA-eligible lines carried 22.5 percent of the prior-year TRIA-eligible direct earned premium. We estimated the TRIA-eligible insurance line direct earned premium in 2018 to be \$218 billion.

- To maximize potential market effects from a very large mandatory recoupment amount, we used the same event size and subset of affected insurers, but the event occurs in 2017 when the time frame for mandatory recoupment is the shortest (1 year and 9 months when collection begins the January following the event). We estimated the TRIA-eligible insurance line direct earned premium in 2016 to be \$209 billion.
- To illustrate potential effects of a very large discretionary recoupment amount, we used an event size of \$100 billion in 2019 that affected insurers with aggregate prior-year direct earned premium equal to those of the top 10 TRIA-eligible insurers. Using SNL Financial's 2014 data, the top 10 insurers of TRIA-eligible lines carried 39.8 percent of the prior-year TRIA-eligible direct earned premium.
- We discuss our results from each of the two analysis methods used (percentage load method or revenue target method).³ These two methods rely on different assumptions about insurers' pricing strategies.

²TRIA-eligible lines are commercial lines of property/casualty insurance, including excess insurance, workers' compensation insurance, and directors' and officers' liability insurance. Subject to certain exceptions, eligible commercial lines also include the following (as listed in the Exhibit of Premiums and Losses of the National Association of Insurance Commissioners): aircraft (all perils), allied lines, boiler and machinery, commercial multiperil (liability and nonliability), fire, inland marine, ocean marine, other liability, products liability, and workers' compensation. The law excludes personal property/casualty, crop, and private mortgage insurance; commercial automobile, burglary, and theft, and professional liability insurance; and health and life insurance.

³In the percentage load method, insurers pass a specified premium increase percentage to policyholders. In the revenue target method, insurers increase premiums in an attempt to maintain total premium revenue.

**Appendix V: Additional Potential Effects of
Recoupment and Alternative Funding Options**

Table 11: Comparison of Potential Market Effects of Recoupment Examples

	Market Effect	\$40 billion event in 2019 resulting in mandatory recoupment of \$31 billion and the average change for the same event in 2017^a	\$100 billion event in 2019 resulting in mandatory recoupment of \$6.2 billion and discretionary recoupment of \$62.5 billion^b
Percentage load method	Years to collect [low, average, high]	5 (program requirement) 2017: 2	Mandatory: 5 (program requirement) Discretionary: [10, 10, 10]
	Percentage change in price [low, average, high]	[2.8, 2.8, 2.8] 2017: 6.3	Mandatory: [0.6, 0.6, 0.6] Discretionary: 3 (program specified)
	Percentage change in participation [low, average, high]	[-1.2, -1.8, -2.3] 2017: -4.0	Mandatory: [-0.2, -0.4, -0.5] Discretionary: [-1.3, -1.9, -2.5]
	Percentage change in insurers' direct earned premium [low, average, high]	[-1.3, -1.9, -2.4] 2017: -4.4	Mandatory: [-0.3, -0.4, -0.5] Discretionary: [-1.4, -2.0, -2.6]
Revenue target method	Years to collect [low, average, high]	5 (program requirement) 2017: 2	Mandatory: 5 (program requirement) Discretionary: [18, 28, 62]
	Percentage change in price [low, average, high]	[5.0, 7.7, 15.8] 2017: 17.1	Mandatory: [1.0, 1.5, 3.2] Discretionary: 3 (program specified)
	Percentage change in participation [low, average, high]	[-2.2, -4.8, -13.0] 2017: -10.8	Mandatory: [-0.4, -1.0, -2.6] Discretionary: [-1.3, -1.9, -2.5]
	Percentage change in insurers' direct earned premium [low, average, high]	[-0.1, -0.4, -2.1] 2017: -1.8	Mandatory: [* , -0.1, -0.1] Discretionary: [0, 0, 0]

Legend: * = smaller than -0.1 percent

Source: GAO analysis of analysis of 15 U.S.C § 6701 and SNL Financial's insurer direct earned premium data. | GAO-17-62

Notes: In the percentage load method, insurers pass a specified premium increase percentage to policyholders. In the revenue target method, insurers increase premium rates to collect, at the margin, additional annual premium revenue up to the annual recoupment amount. Another possibility is that insurers would not pass premium increases to policyholders. Insurers likely would pass increases to policyholders in the recoupment option. We estimated the industry prior-year direct earned premium for 2016 and 2018 Terrorism Risk Insurance Act (TRIA)-eligible insurance lines from SNL Financial's 2014 data annually adjusted by a percentage generated from A.M. Best's estimates of terrorism risk insurance premiums. We used low, average, and high premium elasticity of demand for commercial property/casualty insurance as -0.43, -0.63, and -0.82, respectively. We calculated average elasticity from high and low values. We used elasticity of demand for commercial property/casualty insurance rather than for corporate demand for terrorism risk insurance, which ranges from -0.31 to -0.71, because most premium adjustments would be imposed on commercial property/casualty. See Erwann Michel-Kerjan, Paul Raschky, and Howard Kunreuther, "Corporate Demand for Insurance: New Evidence from the U.S. Terrorism and Property Markets," *The Journal of Risk and Insurance*, 82, no. 3 (2015) 505-530.

^aIn this example, affected insurers had aggregate prior-year direct earned premiums equal to those of the top four TRIA-eligible insurers. The Department of the Treasury (Treasury) recovers all the federal losses through mandatory recoupment surcharges on policyholder premiums of TRIA-eligible lines of

business within the 5-year collection period. We also show the average effects for the equivalent event in 2017 to illustrate how the date of a terrorism event can affect the results.

^bIn this example, affected insurers had aggregate prior-year direct earned premiums equal to those of the top 10 TRIA-eligible insurers. Treasury recovers a small portion of the federal losses through mandatory recoupment surcharges on policyholder premiums of TRIA-eligible lines of business within the 5-year collection period. Treasury recoups the remaining losses through discretionary recoupment.

Insurers

In addition to the effects previously discussed, recoupment could lead to a loss of direct earned premium for insurers following a terrorism event. However, according to one insurer, recoupment may not affect the marketwide availability of terrorism risk coverage. We describe some results and observations from our illustrative analyses relating to insurers' potential loss of premium revenue and findings from literature and interviews.

- The potential losses of TRIA-eligible direct earned premium to insurers vary with factors such as the size of the event, the year of the event, the assumed elasticity of demand, and the assumed insurer pricing methodology. The potential direct earned premium loss could be higher or lower depending on whether coverage was mandatory for the line. For example, states require workers' compensation coverage, so any increase of prices due to a requirement to collect a recoupment surcharge likely would have a small effect on the premium revenue of a workers' compensation insurer.
- In certain scenarios, insurers' potential loss of direct earned premium could be less when losses were recouped under discretionary recoupment compared with mandatory recoupment, because the price increase to policyholders is capped for discretionary recoupment.
- For losses recouped under mandatory recoupment, the time allowed to recoup determine the size of the effect. Greater loss of direct earned premium could occur if the time frame to collect the losses were short. For example, the time frame to collect is shorter for an event that occurs in 2017 (less than 2 years) compared to 2019 (less than 5 years). Using scenarios that had \$40 billion in losses and resulted in high mandatory recoupment (exceeding \$20 billion), we estimated that if premiums were increased by a specified percentage, the 2017 event, on average could lead to about a 4.4 percent loss of TRIA-eligible direct earned premium, compared to about 1.9 percent for the 2019 event. Or if insurers increased prices to collect target amounts, direct earned premiums on average could decrease by 1.8

percent for the 2017 event, compared to about 0.4 percent for the 2019 event.

State Regulators

Federally imposed premium increases in the form of recoupment surcharges might limit the ability of state insurance regulators to restrain potential price increases. State regulators told us that when they review rate increases from insurers, they consider whether the increases are excessive, inadequate, or unfairly discriminatory to policyholders. Two state regulators stated that to the extent the federal government mandated an increase in policyholder premiums through recoupment surcharges, they likely would not have a reason to deny such premium increases.⁴ However, regulators might be able to influence the size of any increase that insurers might submit above the federal surcharge.

Policyholders

In addition to the potential effects of mandatory recoupment, we also estimated potential policyholder price increases and participation decreases resulting from discretionary recoupment. TRIA-eligible insurance prices could increase by a maximum 3 percent and we estimated participation on average could decrease by about 2 percent. For terrorism events that result in very large discretionary recoupment amounts (more than \$60 billion), we estimated the collection period to be as much as 28 years.

Additional Potential Effects of a Federal Charge for Terrorism Risk Insurance

We estimated the potential effects of a premium-like federal charge for terrorism risk insurance under TRIA on policyholder price and

⁴Generally state law requires insurers to file rates (and to file insurance forms) with state regulators that review the rates to ensure they are not excessive, inadequate, or unfairly discriminatory.

participation, and insurers' direct earned premium, using (1) international reinsurance rates and (2) frequency assumptions.⁵

- We estimated the annual federal charge in 2016 as the cost of reinsurance for the maximum federal share of losses and analyzed the effect if the charge was imposed on three different policyholder bases (all property/casualty, with estimated prior-year direct earned premium of \$572 billion in 2015; TRIA-eligible, with estimated prior-year direct earned premiums of \$205 billion in 2015; and TRIA, with direct earned premiums estimated to be 5 percent of TRIA-eligible direct earned premium or \$10 billion in 2015).
- We estimated annual federal charges using the maximum government share of losses from assumed events that occurred at frequencies of every 20, 50 and 100 years and calculated the increase in premium for the three different policyholder bases described above.

Table 12 shows a summary of potential market effect for the federal charge by policyholder group charged.

Table 12: Comparison of Potential Market Effects of a Federal Charge by Policyholder Charge Group Using Average Demand Elasticity

Market Effect	Type	Charge based on				
		Reinsurance cost ^a	Event frequency of 20 years ^b	Event frequency of 50 years ^b	Event frequency of 100 years ^b	
Percentage load method	Percentage change in price	All property/casualty	0.3	0.6	0.2	0.1
		TRIA-eligible	0.8	1.7	0.7	0.3
		TRIA	15.8	33.2	13.3	6.6
Percentage change in participation	Percentage change in participation	All property/casualty	-0.2	-0.4	-0.2	-0.1
		TRIA-eligible	-0.5	-1.0	-0.4	-0.2
		TRIA	-10.0	-20.9	-8.4	-4.2
Percentage change in insurers' direct earned premium	Percentage change in insurers' direct earned premium	All property/casualty	-0.2	-0.4	-0.2	-0.1
		TRIA-eligible	-0.5	-1.1	-0.4	-0.2
		TRIA	-11.5	-27.9	-9.5	-4.5

⁵Previously in this report, we discussed two purposes for which a federal charge could be collected: (1) A charge could be intended to help pay for the federal share of potential losses and could replace the current recoupment provision; or (2) a charge or fee paid to the Treasury for the promise of payment of the federal share of losses with recoupment in place to cover the actual federal share of losses. In this appendix, we analyzed only the former—a charge for the federal share of potential losses under TRIA.

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	Market Effect	Type	Charge based on			
			Reinsurance cost ^a	Event frequency of 20 years ^b	Event frequency of 50 years ^b	Event frequency of 100 years ^b
Revenue target method	Percentage change in price	All property/casualty	0.8	1.6	0.6	0.3
		TRIA-eligible	2.1	4.5	1.8	0.9
		TRIA	42.7	89.7	35.9	17.9
	Percentage change in participation	All property/casualty	-0.5	-1.0	-0.4	-0.2
		TRIA-eligible	-1.3	-2.8	-1.1	-0.6
		TRIA	-26.9	-56.5	-22.6	-11.3
	Percentage change in insurers' direct earned premium	All property/casualty	*	*	*	*
		TRIA-eligible	*	-0.1	*	*
		TRIA	-11.5	-50.7	-8.1	-2.0

Legend: * = smaller than -0.1 percent

Source: GAO analysis of SNL Financial's insurer direct earned premium data. | GAO-17-62

Notes: In the percentage load method, insurers pass a specified premium increase percentage to policyholders. In the revenue target method insurers increase premiums rates to collect, at the margin, additional annual premium revenue up to the annual collection amount required. Another possibility is that insurers would not pass premium increases to policyholders. We estimated the industry prior-year direct earned premium for 2015 Terrorism Risk Insurance Act (TRIA)-eligible insurance lines from 2014 SNL Financial's data annually adjusted by a percentage generated from A.M. Best's estimates of terrorism risk insurance premiums. We estimated TRIA direct earned premiums to be 5 percent of TRIA-eligible direct earned premiums. Using a lower estimate, such as Treasury's estimate of 2.6 percent would increase the estimated impact from of a federal charge applied to terrorism risk premiums. We used average premium elasticity of demand for commercial property/casualty insurance as -0.63, which we calculated from high and low values (-0.42 and -0.82). We used elasticity of demand for commercial property/casualty insurance rather than for corporate demand for terrorism risk insurance, which ranges from -0.31 to -0.71. See Erwann Michel-Kerjan, Paul Raschky, and Howard Kunreuther, "Corporate Demand for Insurance: New Evidence from the U.S. Terrorism and Property Markets," *The Journal of Risk and Insurance*, 82, no. 3 (2015): 505-530.

^aWe estimated the federal charge based on the cost of private reinsurance that other national programs purchase for their programs. We used an average cost of coverage of 2.5 percent and we assumed that the government would purchase coverage for its maximum payout. We show results based on which group of policyholders would be charged.

^bWe estimated the federal charge based on frequency (20, 50, and 100 years) of a maximum payout (\$65 billion). We show results based on which group of policyholders would be charged.

Insurers

Insurers' overall volume of premium could be negatively affected under recoupment and a federal charge for terrorism risk insurance. Additionally, potential insurer loss of direct earned premium resulting from a federal charge for terrorism risk insurance would depend on several factors, including the extent to which insurers pass the cost to policyholders and insurer characteristics.

If insurers were to spread the cost among policyholders from all TRIA-eligible lines of business, our modeled results show potential losses of

direct earned premium of 0.5 percent on average if premiums were increased by a specified percentage or less than 0.1 percent on average if insurers increased prices to collect a target amount.⁶ If spread among policyholders from all property/casualty lines, the losses of direct earned premium could be 0.2 percent on average if premiums were increased by a specified percentage or less than 0.1 percent on average if insurers increased prices to collect a target amount.

A federal charge for terrorism risk insurance could affect insurers' loss of business unevenly. One stakeholder said that the potential loss of business due to a federal charge could vary by insurer size. In particular, small insurers—which may not collect explicit premiums for terrorism—might be affected more than larger ones. An insurer and broker said that small insurers would be less able to absorb the cost from a federal charge and, consequently, more likely to pass the charge to their policyholders. This could increase loss of business of small insurers in two ways: retention of existing clients would decline and attraction of new clients would become increasingly difficult, especially if larger insurers did not pass the charge to their clients and had lower prices. However, one large insurer said it would not be able to absorb a federal charge and would need to pass this cost to its policyholders.

According to insurers, they would incur administration costs associated with a federal charge for terrorism risk insurance. Administration costs would be incurred if insurers would need to collect premiums from policyholders on behalf of the government.

Reinsurers

Implementation of a federal charge for terrorism risk insurance could affect reinsurers differently based on policymakers' design decisions, according to stakeholders. For example, a charge could be designed as voluntary or mandatory. In a voluntary charge, the federal role matches that of a reinsurer, and if Congress allowed private reinsurance to compete with the government under this option, reinsurers could see an increase in market opportunity. If Congress mandated that insurers purchase reinsurance from the government (disallowed competition), reinsurers might see their business decline because insurers would have less funds available to purchase private reinsurance.

⁶We used a federal charge based on reinsurance costs to estimate these results.

State Regulators

Similar to recoupment surcharges, state regulators' ability to restrain potential price increases might be limited under the federal charge option. For example, one stakeholder said that if a federal charge substantially increased prices, states might stop requiring terrorism coverage if it harmed the workers' compensation market. One stakeholder stated that the portion of rate increases that insurers imposed to make up for premium revenue losses likely would receive more scrutiny from state regulators.

Additional Potential Effects of Terrorism Set-Asides

We obtained information on the potential effects of insurer terrorism set-aside approaches on different industry stakeholders.⁷ Approaches that did not involve segregated assets likely would result in no or minimal impact on price, participation, or insurer direct earned premium. Approaches that involved segregated assets (as in our interpretation of the legislative proposals) could have some impact on price, participation, and insurer direct earned premium because they might require insurers to raise additional capital. However, we did not determine the size of any increase.

Insurers

To the extent that prices increased, insurers' overall direct earned premium could be negatively affected under the terrorism set-aside approaches. Stakeholders said that if a segregated set-aside were required, insurers might need to raise more capital to increase capacity for their other lines of business and would need to earn an acceptable return on capital for shareholders. Stakeholders reported that capital could be raised in the markets, which would increase the insurer's cost of doing business, or it could be raised by increasing premiums on policyholders.

Insurers may also incur administrative costs associated with a terrorism set-aside for terrorism risk. Specially, three insurers indicated increased business costs associated with a terrorism set-aside and one insurer

⁷The terrorism set-aside approaches would retain TRIA's recoupment provisions.

stated that any effect on its business costs would depend on the tax implications for any capital considerations.

Reinsurers

Reinsurers could experience decreases in market opportunities under the terrorism set-aside option, but reinsurance availability likely would not be affected. As discussed above, most insurers fund reinsurance purchases from premiums. To the extent that insurers would need to build terrorism set-asides, they might have less capital available to purchase reinsurance unless one purpose of the set-aside was to build funds to purchase reinsurance. For this reason, reinsurers also could experience a loss of business as a result of a requirement for a terrorism set-aside. Furthermore, if the government were to give the same tax advantage to the set-asides as post-event loss reserves, insurers could have less need for reinsurance.

Two industry participants stated that the potential supply of reinsurance for terrorism likely would be unaffected by a terrorism set-aside requirement. For example, one industry participant stated that insurer actions would not strain reinsurance supply or affect reinsurance pricing.

State Regulators

Unlike with a federally mandated premium increase, state regulators might have purview over any insurer increases to cover the cost of a terrorism set-aside because increases likely would be determined by insurers rather than be federally mandated. In this case, insurers likely would need to follow normal rate increase protocol. If premium increases to cover the cost of a terrorism set-aside were minimal, regulators and policyholders might not notice the increase. However, regulators may have additional oversight responsibilities under set-aside approaches. For example, two state regulators pointed out that implementing a set-aside for potential terrorism losses with specifically segregated assets could affect state oversight related to laws and practices involving receivership and liquidation should an insurer become insolvent.

Policyholders

Stakeholders had differing opinions on whether insurers would increase premiums as a result of terrorism set-asides. For example, three insurers stated that such a set-aside would require insurers to increase premiums, while another stakeholder stated that any effect on premiums might be

negligible. One stakeholder estimated that companies with exposure in high-risk areas such as New York City had a need for a large set-aside, while others may not; however, these estimations assume that the set-aside only would be for insurers' share of the losses. The approach in which insurers would set aside funds that could be used for both insurer and federal losses likely would require a larger target amount. One insurer said that insurers could spread costs across all lines of business. Similar to the federal charge, that type of cost sharing for the set-aside would have a negligible impact on policyholder premiums.

Appendix VI: Extent to Which an Economic Subsidy Exists within the Terrorism Risk Insurance Act

In this appendix, we discuss the extent to which the role of the federal government under the Terrorism Risk Insurance Act (TRIA) creates an economic subsidy for market participants and the potential size of such a subsidy. We determined that TRIA could produce a federal government economic subsidy to the extent the government was not expected to fully recoup its losses. Estimating the size of an economic subsidy depends on many factors and requires several assumptions that we discuss later in this appendix.

To the Extent That Losses Are Not Expected to Be Recouped, the Federal Government Provides an Economic Subsidy under TRIA

Under TRIA, the federal government initially shares responsibility for some of the insured losses with private insurers in the event of a certified terrorism event and may recoup all or some of its losses through policyholder surcharges.¹ Unlike private insurers or reinsurers, the government does not charge premiums for its potential share of terrorism losses but may recoup some or all of its losses post-event. Specifically, Treasury reimburses an insurer for a certain percentage of its insured losses above its deductible.² If insurers' aggregate losses are equal to or below the industry aggregate retention amount, TRIA requires mandatory recoupment of the federal losses up to the retention amount reached by the losses through post-event premium surcharges on all policyholders with TRIA-eligible insurance, including those with no insured losses and

¹Under TRIA, all commercial property/casualty insurers must make terrorism insurance available to their policyholders but policyholders are not required to purchase it. However, the federal share of losses from a terrorism event would be recouped from all TRIA-eligible policyholders. This creates a cross-subsidy in that all TRIA-eligible policyholders are subsidizing the subset of these policyholders who had purchased terrorism risk coverage. We did not assess this cross-subsidy.

²The program caps liability for insurers that have met their deductible and for the government at \$100 billion per year; policyholders are not compensated for terrorism losses above that cap.

those without terrorism risk coverage.³ In addition, TRIA allows for discretionary recoupment when losses exceed the industry aggregate retention amount. As structured, the program potentially exposes the federal government to a significant amount of financial risk and it does not require recoupment of all losses and expenses in some scenarios.

For the purpose of this report, an economic subsidy can involve a payment by the government that reduces the buyer's price below the seller's price.⁴ Whether there is no payment involved or in addition to a payment, an economic subsidy can involve the full or partial absence of a charge by the government for an action that benefits private market participants.⁵ Either case implies a payment or benefit from the government to private market participants, for which the government receives no commensurate benefit. Certain types of government intervention could produce an economic subsidy. Table 13 lists some government interventions and their applicability to TRIA.

³Treasury must collect 140 percent of the losses apportioned to mandatory recoupment. The legislative and Congressional records do not include any substantive discussion of the purpose of the 40 percent mandatory recoupment scaling factor. According to the Congressional Budget Office, the scaling factor would address lost federal tax revenue as policyholders deducted the recoupment charges from their income taxes as well as provide some compensation to the government for bearing risk. Congressional Budget Office, *Federal Reinsurance for Terrorism Risk in 2015 and Beyond*, Working Paper 2015-04 (Washington, D.C.: June 2015). TRIA-eligible lines are commercial lines of property/casualty insurance, including excess insurance, workers' compensation insurance, and directors' and officers' liability insurance. Subject to certain exceptions, eligible commercial lines also include the following (as listed in the Exhibit of Premiums and Losses of the National Association of Insurance Commissioners): aircraft (all perils), allied lines, boiler and machinery, commercial multiperil (liability and nonliability), fire, inland marine, ocean marine, other liability, products liability, and workers' compensation. The law excludes reinsurance, personal property/casualty, crop, and private mortgage insurance; commercial automobile, burglary and theft, and professional liability insurance; and health and life insurance.

⁴Robert S. Pindyck and Daniel L. Rubinfeld, *Microeconomics*, 8th ed. (Boston, Mass.: Pearson, 2013): 345-349.

⁵Veronique Bruggeman, Michael Faure, and Tobias Heldt, "Insurance against Catastrophe: Government Stimulation of Insurance Markets for Catastrophic Events," *Duke Environmental Law and Policy Forum*, vol. 23, no. 185 (2012).

Table 13: Government Interventions That Could Produce an Economic Subsidy and Their Application to TRIA

Type of government intervention	Application to Terrorism Risk Insurance Act (TRIA)
Federal government intentionally provides goods or services at no cost or below market price to businesses	<ul style="list-style-type: none"> • A federal government backstop is provided to insurers and policyholders at no cost before an event, and insurers and policyholders may be responsible for paying either none or only a portion of the cost after an event. • The federal government acting as the backstop without establishing any reserves implies that the government is willing to incur costs for its share of losses that exceed mandatory recoupment amounts.
Federal government provides credit directly or through a loan guarantee to businesses and the final credit subsidy amount will not be known until the life of the loan is complete	<ul style="list-style-type: none"> • Under the program’s current post-event recoupment the federal government’s share of the losses only will be known after the event.
Federal government’s regulation of businesses create net benefits	<ul style="list-style-type: none"> • Not applicable. TRIA does not directly affect the federal regulation of insurers or reinsurers, which is limited except in the case of insurers that have been designated as systematically important financial institutions.

Source: GAO analysis of certain federal programs and TRIA. | GAO-17-62

While TRIA is designed to recoup at least a portion of the federal share of losses, in some scenarios recoupment could adversely affect the market. For example, in some scenarios, the mandatory recoupment time frames could lead to large increases in policyholders’ premiums, which could affect the political will to carry out mandatory recoupment. In addition, the discretionary portion of recoupment could require a protracted collection period of premium surcharges, which could be a factor in Treasury’s determination of whether and to what extent to pursue discretionary recoupment. As a result, market participants and others may not expect the government to fully implement TRIA’s recoupment provisions. As such, in this report we assess the presence and potential size of an economic subsidy on the basis of whether and to what extent the government would be expected to recoup the federal share of losses, regardless of whether a terrorism event occurs.

To the extent the losses to the federal government were not expected to be fully recouped, the federal government would be providing an economic subsidy because insurers and policyholders would receive a benefit from the federal government in the absence of a charge.⁶ In certain ways, the economic subsidy could benefit private insurers and the policyholders. However, if the government was not expected to fully recoup its losses, the primary recipients of the subsidy would be the

⁶Although the federal government may receive other benefits from its intervention (for example, TRIA may reduce demand for post-event assistance), the government subsidy likely would be a net cost.

policyholders because they would have received insurance coverage without paying either pre-event premiums for the federal share of losses or the actual full costs post-event.⁷

Potential Size of an Economic Subsidy Depends on Extent to Which Recoupment Is Expected to Be Implemented and Certain Factors Affect Ability to Accurately Estimate the Size

Using various assumptions and taking into account several limitations, we analyzed the potential size of an economic subsidy under different recoupment scenarios. We estimated the size of a subsidy by determining the value of insurance coverage without knowledge of whether, and to what extent, claims would occur.⁸ Specifically, using the cost of private reinsurance in other national programs we estimated annual forgone federal terrorism risk insurance premiums in scenarios in which the government would be expected to (1) recoup only the mandatory amount of losses, and (2) recoup no losses.⁹ We estimated the annual cost of the economic subsidy could be as high as \$1.6 billion if the government were not expected to recoup any of its losses. However, if the government were expected to recoup all of its losses as described in TRIA, the economic subsidy would be \$0 (no subsidy).

Certain factors, such as limited data, limited our estimation method and affected our ability to accurately estimate the potential size of any subsidy. We used terrorism risk reinsurance rates in other national

⁷In addition to the potential economic subsidy policyholders and insurers may receive if the government did not fully recoup, insurers and policyholders may receive a benefit from the existence of a federal backstop. Specifically insurers benefit because the backstop allows them to provide coverage that they might not be able to provide at prices policyholders would be willing to pay without the program. Policyholders benefit because the backstop ensures the availability and affordability of terrorism risk insurance coverage.

⁸For certain purposes, the size of a subsidy also could be measured retrospectively based on actual or assumed claims experience rather than value-of-insurance measures.

⁹To determine the potential annual federal share of losses in the program, we modeled the program maximum event size of \$100 billion. We simulated losses under the current TRIA program using 2014 SNL Financial's data on the size of the property/casualty insurance market (see app. II). We used an event year of 2016 and affected insurers with an aggregate premium base equal to the top 20 insurers and therefore contributing to the industry deductible and co-share. Additionally, we included a governmental administrative cost of 5 percent.

programs to estimate forgone premiums in the TRIA program because we lack data to determine premiums that would be required for any other estimation method.¹⁰ Currently premiums are not collected from policyholders for the federal share of losses, and the government would need to consider many factors in potentially setting a federal charge for terrorism risk insurance. Using reinsurance rates charged by private reinsurers to other national terrorism risk insurance programs for our estimate of forgone premiums could provide information on how the private market values terrorism risk insurance and the cost of capital to provide that insurance. We were told by the broker of many reinsurance deals in other national programs that premium rates were fairly stable across countries and generally ranged from 2 percent to 3 percent of the dollar amount of coverage. For example, the Australian terrorism risk insurance program purchased reinsurance in 2014 for six layers of reinsurance, with the rates ranging from 1.85 percent to 5.5 percent of coverage.¹¹ Rates decreased with each additional layer of cover. For our analysis, we used an average cost of 2.5 percent of coverage and we assumed that the government would purchase coverage for its maximum payout. Use of other data or another estimation method could result in a different estimate of a subsidy amount.

Finally, the estimation of the size of any subsidy could be affected by different assumptions about the private reinsurance market. There are limitations to our use of the cost of private reinsurance in other national programs to estimate forgone federal terrorism risk insurance premiums to the United States.

- First, the private reinsurance market may price coverage differently for the U.S. program or may be limited in the amount it is willing to cover. For example, the private reinsurance market may not consider the risk within the United States commensurate with risks in other countries; U.S. risk may not be sufficiently geographically diverse to qualify for the same pricing; or Treasury may not have sufficient information on

¹⁰In a previous report, we estimated the size of a government subsidy in the National Flood Insurance Program by considering forgone premiums. See GAO, *Flood Insurance: Forgone Premiums Cannot Be Measured and FEMA Should Validate and Monitor Data System Changes*, [GAO-15-111](#) (Washington, D.C.: Dec. 11, 2014).

¹¹Australia's average rate-on-line—the ratio of premium paid to loss recoverable in a reinsurance contract—across all layers of reinsurance was 2.5 percent of coverage.

the risk of the underlying portfolio for reinsurers to price the coverage.¹²

- Second, the capacity of the private reinsurance market may not be sufficiently large for the amount that we assume would be purchased in this analysis. Programs in other countries purchase much smaller amounts of reinsurance. For example, the Australian program purchased just under \$2 billion (about A\$3 billion) of reinsurance coverage in 2014. Our analysis assumed that the United States would need to purchase more than 30 times that amount (about \$65 billion in reinsurance coverage).
- Third, the government might not choose to purchase this much reinsurance. For example, the government might choose to self-reinsure or charge less in premiums.
- Fourth, our analysis assumes the entire amount would be covered by private reinsurance. However, reinsurance purchasers generally must pay a deductible, co-share, or both, which would decrease the actual amount of reinsurance coverage purchased.

¹²Treasury has begun collecting data on pricing, take-up rates, and exposures, among other items from insurers participating in TRIA as required by the 2015 reauthorization of TRIA.

Appendix VII: GAO Contact and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, Jill Naamane (Assistant Director); Charlene J. Lindsay (Analyst in Charge); Robert Dacey; Pamela Davidson; Karen Jarzynka-Hernandez; DuEwa Kamara; John Karikari; Alma Laris; Emei Li; Efrain Magallan; Scott McNulty; Susan Murphy; Joseph O'Neill; Laurel Plume; Angela Pun; Oliver Richard; Barbara Roesmann; Jessica Sandler; Jena Sinkfield; Shannon Smith; Andrew J. Stephens; and Frank Todisco made key contributions to this report.

Appendix VIII: Accessible Data

Data Table

Data Table for Figure 4: Initial Loss-Sharing Amounts under Terrorism Risk Insurance Act for Hypothetical 2016 Terrorism Events Affecting a Premium Base Equal to That of Top 10 Insurers

Amounts in billions of dollars

Size of Event	Government Loses	Insurer Loses
5	0	5
25	7.27	17.73
50	28.27	21.73
75	49.27	25.73
\$100	70.27	29.73

Data Table for Figure 5: Initial Loss-Sharing Amounts under Terrorism Risk Insurance Act for Hypothetical \$50 Billion Terrorism Event Occurring in 2016 and Affecting Various Premium Bases

Amounts in billions of dollars

	Government Loses	Insurer Loses	DPE
Top 4 insurers	34.24	15.76	22.5
Top 10 insurers	28.3	21.73	39.8
Top 20 insurers	22.9	27.13	55.5
All insurers	7.5	42.47	100

Data Tables for Figure 6: Potential Mandatory and Discretionary Recoupment Amounts under 2015 Reauthorization of Terrorism Risk Insurance Act for Different Event Sizes and Subsets of Affected Insurers, 2016

Event size	Mandatory recoupment for Top 4	Discretionary Recoupment for Top 4
25	13.2439	NA
50	15.7	18.5
75	11.7439	43.5
100	7.74391	68.5

Event size	Mandatory recoupment for Top 10	Discretionary Recoupment for Top 10
25	7.26996	na
50	9.8	18.5
75	5.76996	43.5
100	1.76996	68.5

Event size	Mandatory recoupment for Top 20	Discretionary Recoupment for Top 20
25	1.87272	
50	4.4	18.5
75	0.37272	43.5
100	0	64.8727

Event size	Mandatory recoupment for All	Discretionary Recoupment for All
25	NA	NA
50	NA	7.5
75	NA	28.5344
100	NA	49.5344

Data Table for Figure 7: Direct Earned Premiums from Categories of Property/Casualty Lines of Business and Insurer Market Share, 2014

Two venn diagrams.

One showing Insurer market share by direct earned premium. (in billions of dollars)

	Percentage	direct earned premium.
All insurers	100	201.13
Top 20 insurers	55.5	80.1239
Top 10 insurers	39.8%	111.62
Top 4 insurers	22.5%	45.262

Second Venn diagram showing direct earned premium (in billions of dollars)

		direct earned premium.
Direct earned premium for all insurers	Direct earned premium from TRIA eligible lines	\$201 billion
	Estimated direct earned premium from terrorism risk insurance	\$10 billion
Direct Earned premium from all property/casualty lines of business	Total	\$560 billion

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