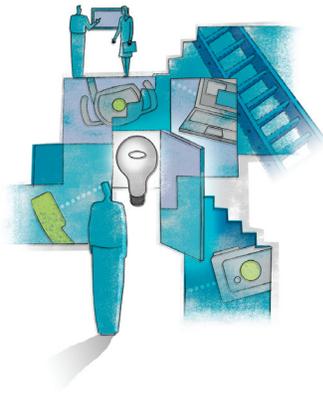


# Financing Losses from Catastrophic Risks



THE TERRORIST ATTACKS OF SEPTEMBER 11<sup>th</sup> and Hurricane Katrina together claimed over 4,000 lives and destroyed parts of New York, Washington, and Louisiana. Beyond the human toll, they also created large financial losses borne by families, businesses, and insurance companies. This process led insurance companies to reduce coverage for future disasters and raise premiums. The government responded by attempting to use regulations and subsidies to keep insurance markets functioning. This ad hoc process created uncertainty about who would benefit, helped some industries but not others, and furthered the perverse incentives to rebuild in dangerous areas without taking the full cost of these actions into account.

In a discussion paper for the Hamilton Project, two economists—Kent Smetters of the Wharton School at the University of Pennsylvania and David Torregrosa of the Congressional Budget Office—find that government intervention in the catastrophe insurance market has unintended consequences that, in the long run, may exacerbate the problems of low supply and high prices, leaving Americans unprepared for future disasters. Any solution must involve reforming and improving government's role to promote legitimate government interests while minimizing counterproductive long-term impacts. Smetters and Torregrosa evaluate four possible ways to promote a more stable market for catastrophe insurance: establishing a federal insurance charter, changing the regulatory accounting treatment of risk transfer arrangements, reforming the taxation of earnings on insurance companies' reserves, and auctioning off federal reinsurance.

## THE CHALLENGE

Although intermittent natural and man-made catastrophes are inevitable, they are also very difficult to foresee and prepare for. The two greatest U.S. disasters of the 21st century—the terrorist bombings of the World Trade Center and the Pentagon in 2001 and Hurricane Katrina in 2005—caused roughly \$80 billion in privately-insured losses and many tens of billions of dollars of losses that were covered by the government or borne by the affected individuals and businesses. Faced with these immense losses, insurers reacted as they have traditionally done after catastrophic events: by reducing the supply and increasing the price of new catastrophe insurance policies.

The recurring cycle of decreased supply and increased price following catastrophic events makes it difficult for businesses and homeowners to find affordable insurance. Government has tried in various ways to break this cycle. And indeed it has several good reasons to intervene. For one, decreased catastrophic insurance coverage would have significant negative spillover effects for the economy as a whole. Uninsured households wiped out by catastrophes could be pushed into bankruptcy and default on their mortgages, potentially causing a cascading effect in a geographic region akin to that seen during the current subprime crisis. Nondiversified businesses would also face large unexpected losses, reducing overall economic activity. In many cases these concerns motivate the government to mandate that businesses and households purchase catastrophe insurance, which in turn increases pressure on the government to ensure that such insurance is available and affordable to all.

In addition to the negative externalities of low insurance coverage, the government has an interest in reducing its own de facto exposure to catastrophic risk. Through emergency relief allocations, the government spends billions of dollars covering uninsured losses from natural and man-made catastrophes.

Given these concerns, the government has historically intervened in the catastrophic insurance market in order to increase supply and maintain low prices, especially after major high-cost events. These policies include subsidizing premiums, mandating that private insurers offer catastrophe insurance at low prices, and providing public alternatives to private insurance. Although such policies increase the affordability of insurance in the short run, Smetters and Torregrosa argue that in the long run they can have the unintended consequences of reducing private sector supply and discouraging businesses and individuals from taking steps to mitigate risks themselves. Further, the authors argue that the consistent problems of low supply and high prices might be exacerbated by traditional regulatory rules that have failed to keep up with the pace of innovation in the insurance industry. Such policies include accounting regulations that limit the usefulness of hedging mechanisms and corporate tax policies that increase the price of catastrophe insurance compared to non-catastrophe insurance.

A recent example of the government subsidizing premiums is the Terrorism Risk Insurance Act (TRIA) of 2002. TRIA requires insurance companies to offer terrorism insurance, heavily subsidized by the government, that pays 85 percent of an insurer's losses after the insurer pays a deductible. The government would recoup any outlays after an event by levying taxes on insurers and policyholders. The act also puts the government into the reinsurance business—the practice of selling insurance to primary insurers themselves. Between 2003, shortly after TRIA was enacted, and the first half of 2007, the share of companies buying terrorism insurance shot up from 27 percent to 64 percent.

At the state level, some governments also regulate the prices that insurers can charge, often setting rates below the competitive level. Such state regulations can create a disconnect between the price of insurance and its underlying cost. All states but Texas require insurance companies to offer workers' compensation, with

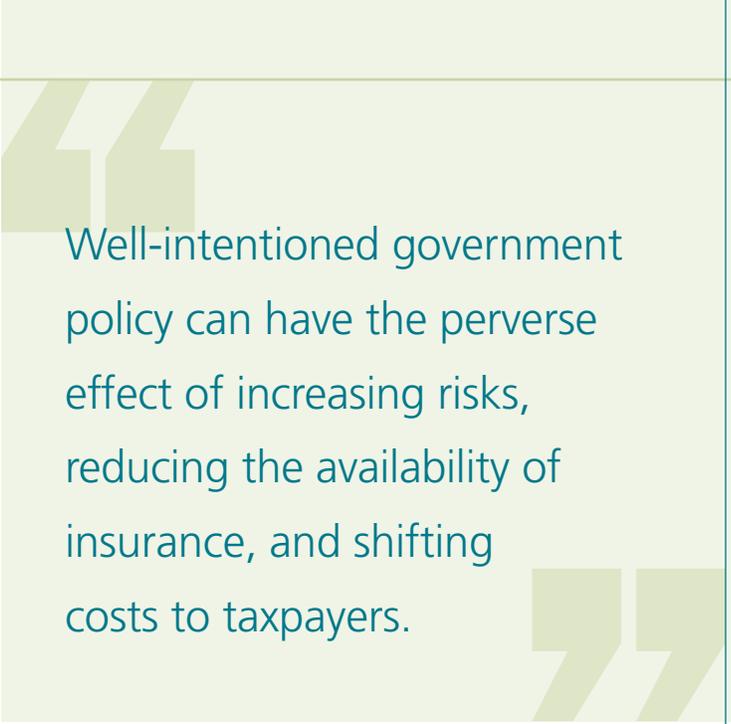
rates and benefits determined by state legislatures. Insurers must offer coverage with the same terms and rates to workers everywhere within the state, from sparsely populated farmland to heavily-occupied office buildings.

Policies that subsidize insurers' losses, such as TRIA, or mandate low prices, such as state regulation, shift the cost of insurance to taxpayers and to companies and households less exposed to catastrophic risk. In addition, by artificially lowering the cost of insurance contracts, such policies encourage inefficient construction in areas at greatest risk because households and businesses do not bear the full cost of the added risk. This perverse incentive could actually increase the eventual total loss to society from a catastrophic event. And even with government subsidies, Smetters and Torregrosa argue, companies may find they cannot afford to supply insurance at the low government-regulated prices.

When government subsidies are not enough to entice private insurers into the market, or when mandated low prices keep them from offering insurance to certain customers they deem too risky, policymakers have often intervened by providing catastrophe insurance through the public sector. Florida has a state-sponsored plan for hurricane insurance and California has a plan for earthquake insurance. Public programs to provide affordable insurance certainly help those they directly serve, but these benefits must be weighed against their downsides. Just as with subsidies and price mandates for private insurance, publicly provided and financed insurance creates moral hazard by giving risky buyers a distorted price signal and encouraging more construction in areas at risk of disasters. Public provision can also crowd out the private sector, reducing long-run private supply and increasing the burden on taxpayers and less-risky insurance buyers.

### Regulatory and Tax Distortions

Smetters and Torregrosa identify at least two other government policies that unintentionally contribute



Well-intentioned government policy can have the perverse effect of increasing risks, reducing the availability of insurance, and shifting costs to taxpayers.

to the high prices and low supply of catastrophe insurance. First, accounting and legal regulations have not kept up with the pace of innovation in the reinsurance market. Reinsurance is when a primary insurer itself buys insurance. Under common accounting regulations, a primary insurer that buys reinsurance gets credit for reducing its exposure, which it can record on its books. But this type of traditional reinsurance has become increasingly expensive after recent catastrophic losses. Insurers are now turning to alternative instruments for reinsurance. Unlike traditional reinsurance, which pays out based on the primary insurer's actual losses, these alternative instruments pay out according to easily observable indices that are correlated with insured losses (such as the Richter scale for earthquake losses or wind-intensities for hurricane losses). The advantage of these forms of reinsurance is that they do not require reinsurers to monitor the practices of the primary insurance company or to charge a deductible to discourage moral hazard. Instead, they simply require reinsurers to take bets on the probabilities of various events, opening up participation to a wider range of actors in capital markets.

The problem, however, is that under current accounting guidelines put forward by the National Association of Insurance Commissioners (NAIC), some of those alternative instruments cannot be recorded as credits because they do not perfectly cover the insurer. Since

## Key Highlights

### The Challenge

The government tends to intervene in the market for catastrophic risk insurance because of the negative effects of underinsurance and the risk to taxpayer resources if private insurance cannot cover losses from catastrophes. In the short run, the government intervention after a catastrophic event may indeed result in more insurance coverage. In the long run, however, government intervention could decrease the supply of catastrophe insurance and increase its price.

There is an important role for government in such insurance markets because of the negative externalities associated with being uninsured, but Smetters and Torregrosa argue that in some notable cases the government does more harm than good:

- **Regulation of premiums and insurance coverage** leads to high-risk policyholders not paying the full cost of their risk but instead being subsidized by lower-risk policyholders
- **Newer products for sharing risks** may not qualify for the same credit as traditional reinsurance products, which thwarts innovation in these perhaps more effective products
- **Interest on insurance companies' reserves are taxed** at both the corporate and the individual level even though insurance companies, especially those insuring against catastrophic risks, have to keep a large quantity of reserves on hand in the case of a claim

### Four Possible Solutions

Smetters and Torregrosa analyze the advantages and disadvantages each of the following options:

- **Establish an optional national charter** for catastrophic insurance so that insurance companies do not have to navigate 50 different systems of regulation
- **Allow insurers to get credit for purchasing** non-traditional reinsurance products that reduce exposure to catastrophic risk
- **Reform tax regulations** so that catastrophe insurers can maintain larger reserves or can get back taxes paid in the case of a claim
- **Allow the government to sell federal reinsurance** through an auction to lower taxpayer risk

states generally adopt NAIC recommendations on regulatory issues, they do not consistently offer credit to primary insurers buying non-traditional, but arguably more effective, reinsurance products. Current regulation thereby reduces the ability of catastrophe insurance suppliers to hedge their risk and in the long run may constrain supply and increase prices.

Second, catastrophe insurance is effectively taxed at a higher rate than non-catastrophe insurance—driving up prices and reducing the availability of catastrophe insurance. This happens because firms have to set aside large capital reserves to cover the potentially large but low-probability losses from a major catastrophic event. But the interest on these reserves is taxed at both the corporate level and the individual level, as compared to other ways that investors could invest their money. In order to compensate the investors, insurers have to pass on these taxes to their customers. This is a much smaller issue for non-catastrophe insurance plans, like health insurance, where the aggregate losses in any given year are reasonably predictable and thus there is little need for large capital reserves.

The government has a legitimate interest in expanding the supply and take-up of affordable catastrophe insurance and requiring insurance companies to submit to adequate oversight and pay their fair share of the tax burden. But the policies Smetters and Torregrosa describe are examples of the government's going too far or failing to keep up with rapidly developing markets. The challenge, then, is to find the right amount and type of government involvement. The government must strike a balance between promoting the public interest and not contributing in the long run to higher prices or reduced supply of crucial catastrophe insurance.

### EVALUATION OF FOUR POSSIBLE PROPOSALS

Smetters and Torregrosa evaluate four proposals that, according to their proponents, would shore up the private sector's ability to cope with the aftershocks of disasters. Each proposal could mitigate some of

the unintended negative effects of government regulation, though as with any proposal, their benefits would have to be balanced against their drawbacks.

**National Charter.** Unlike banks and securities firms that have the option of a federal charter, insurance companies currently must follow 50 sets of rules and submit to 50 regimes of rate regulation. A federal charter could reduce the current burden on insurance companies and thus the associated inefficiencies for their customers. Insurance companies would have the option of abiding by the regulations in the federal charter or continuing in the state regulatory system. Smetters and Torregrosa suggest that a federal charter might increase competition, increase innovation, and spur regulatory reform at the state level.

One component of the federal charter might be a prohibition on regulating premiums. The proposed National Insurance Act of 2007 would have had such an effect. In the few states such as Illinois that regulate rates lightly or not at all, competition between insurers has actually resulted in lower rates. Any states that did not experience this rate reduction could supply businesses and even homeowners with vouchers for insurance purchases, thus maintaining free-market competition for their business. Vouchers could more easily target low-income policyholders than the current premium subsidies, which benefit those with the most expensive properties.

The authors caution that the federal government may not be as well placed to regulate the insurance market as states, which may have more information about the local market or can be more responsive to residents' concerns. Another potential downside of a federal insurance charter is that it would require the creation of a new regulatory structure, creating new bureaucracy within the government. Finally, there is no guarantee that the federal regulations would be any more sound than the current rules are.

The challenge is to find the right amount and type of government involvement, striking a balance between promoting the public interest while not raising prices or reducing the availability of catastrophe insurance.

**Non-traditional reinsurance.** As discussed earlier, if an insurance company can purchase reinsurance, it will be less exposed to major risks. The private sector has a substantial number of hedge funds and other investors who would be willing to take on these risks which, although potentially in the tens of billions of dollars, are still small relative to overall capital markets. Spreading the risks to more firms and the capital market more broadly helps to make offering insurance more attractive, in turn lowering prices and enhancing options for consumers.

The key is to allow insurance companies to get credit from regulators for buying reinsurance products that are not directly linked to their actual losses, for example reinsurance that pays off based on the Richter scale of an earthquake or the wind speed of a hurricane.

Of course, the regulation could not be relaxed completely. Primary insurers would still be required to be protected against major payouts and if they purchased hedges purely on speculation—for example a hurricane insurer in Florida buying a hedge against earthquakes in Tokyo—that should not count. Regulators would need to establish a 'minimum hedge effectiveness ratio' that any alternative reinsurance product would have to satisfy. Such a change could be made by a new national regulator, by the NAIC guidelines that most states follow today, or by individual states.

An important part of the solution to financing catastrophic losses is enabling insurance companies to tap the deep reservoir of capital in the private sector to spread risks more broadly.

**Tax reform.** One potential reform to address the tax wedge between catastrophe and non-catastrophe insurance is to permit insurance companies to put aside money tax-free to cover expected claims. Private mortgage guaranty insurers are already allowed to hold half of their premiums in tax-deductible reserves for 10 years, and some European countries already allow tax-free reserves for catastrophic losses. Another option would be to allow catastrophe insurers to recover taxes paid in the event of a claim. Currently they can recover taxes paid two years prior, but this policy could be changed to ten or even twenty years. Product liability insurers can already regain taxes paid for the ten prior years. Such a tax change would reduce the premiums that catastrophe insurers would have to charge in order to cover the tax liability from their capital reserves.

Such a tax change would have various downsides. First, it would be costly to the government, reducing corporate income tax revenues. Second, it could provide an unintended incentive to allocate capital to insurers rather than other institutions still subject to higher taxes. Finally, without proper regulation, insurance companies might overestimate expected losses in order to shelter more money from taxation.

**Reinsurance auctions.** In the absence of other action, the federal government is effectively the insurer of last resort for natural disasters, and TRIA authorizes it to provide free reinsurance for terrorism risks. Some ana-

lysts favor explicitly authorizing the government to sell reinsurance to insurers and state-sponsored programs. Unlike private companies, the federal government would not need to hold reserves and would face more diversified risks.

The major challenge of such a government program to sell insurance would be pricing the reinsurance correctly. Federal programs normally do not set risk-adjusted premiums. Government insurance programs are more prone to the classic insurance problems of adverse selection and moral hazard, and they may also crowd out private suppliers.

One way to promote more appropriate pricing is to sell the reinsurance to insurers and state-sponsored programs via auction. An auction would result in market determination of risk-adjusted premiums as long as there was significant competition in the bidding. A successful government auction program might have several features:

- a minimum bid that covers expected losses and administrative costs
- a large deductible of losses that policyholders must take on before the government reinsurance takes effect
- maximum liability
- a requirement that states purchasing reinsurance take actions to reduce risk
- separate auctions for separate regions or even specific states such as California and Florida

A key component of this proposal is that it would be designed to cover only the highest levels of losses. The goal is to send an appropriate price signal and help the government recoup the money that it currently provides for free as ‘insurer of last resort’ for the biggest catastrophes. Thus insurers would have to sustain large losses before the federal contracts paid any money.

It is important to note that even with these backstops, significant amounts of taxpayer money would be put at

risk, and the risk would be tied to the most dramatic and thus unpredictable catastrophes. Although auctions are a good way of aggregating the information available in the private market, they are far from perfect when that information is as uncertain as the probabilities and magnitudes of catastrophic events. One way that some legislative proposals have addressed this unpredictable risk to taxpayer money is to require that minimum prices at the auction reflect expected losses plus a ‘risk load’ to capture the uncertainty inherent in trying to predict those losses.

## CONCLUSION

Smetters and Torregrosa want to limit the need for the government to take scattershot, ex post actions in response to major catastrophic events like earthquakes and hurricanes. They worry that government action is often too little, too late, and has unintended and perverse consequences that can make it harder to purchase private insurance and lead to distorted choices like building in dangerous areas. In addition, they are concerned about the possibility of unfair transfers from taxpayers to certain favored groups.

Strengthening the private market for insurance could reduce the need for ad hoc government intervention. A potentially important part of the solution is enabling insurance companies to tap the deep reservoir of capital in the private sector to spread the risks more broadly. Such policies include setting up a national charter option for insurance companies, allowing primary insurance companies to get credit for a wider array of reinsurance products, and changing the tax treatment of reserves.

Even with these reforms, however, there may still be a need for government to support private market functions. The federal government could auction off reinsurance products to primary insurance companies, making them pay ex ante for benefits that would otherwise be provided for free after a catastrophe. Though it will not be without its difficulties, formalizing the role of the government in the insurance market could spur more private activity in this formative market while maintaining an important role for regulation.

## Learn More About This Proposal

This policy brief is based on The Hamilton Project discussion paper, *Financing Losses from Catastrophic Risks*, which was authored by:

### KENT SMETTERS

Associate Professor, The Wharton School at the University of Pennsylvania

Smetters’ recent research has focused on public policy, including social security and tax reform.

### DAVID TORREGROSA

Analyst, Congressional Budget Office

Torregrosa’s work focuses on proposals for federal disaster and terrorism insurance, risks that the government-sponsored enterprises pose to taxpayers, as well as federal financial and budgetary accounting issues.

## Additional Hamilton Project Proposals

Hamilton Project discussion papers and policy briefs can be found at [www.hamiltonproject.org](http://www.hamiltonproject.org), including:

- **Tax-Base Insurance:** The volatility of state tax revenues can force states and localities to cut back on necessary programs or raise taxes at a time when the state economy is already suffering. By pooling the risk of tax revenue losses, a tax-base insurance program could compensate states and localities for lost tax revenue, allowing them to respond to fiscal crises without raising taxes or cutting services to those most in need.
- **Increasing Annuitization in 401(k) Plans with Automatic Trial Income:** Despite their many benefits, the take-up rate for annuities is currently low because of behavioral biases and market failures. This paper proposes a two-year trial to allow retirees to experience the consistency, security, and simplicity of the lifetime income stream guaranteed by annuities. The authors hope that this experience will provide retirees with more information and help them better manage their financial resources.
- **Shared-Equity Mortgages:** One of the biggest financial risks a household can face stems from the rising and falling value of their home. Traditional mortgages amplify this risk by leveraging up the household’s equity in their home. A new type of shared-equity mortgage could instead help households reduce these risks by, for example, reducing the amount households need to repay when their home falls in value. This forthcoming paper identifies some of the policy steps that need to be taken to foster a market in shared-equity mortgages.

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