

Mitigating Catastrophe Risk for Landowners

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Local, national, and global catastrophes entail significant risk for landowners. The government-sponsored National Flood Insurance Program illustrates how subsidizing insurance against catastrophe risk can result in overinvestment in risk-prone properties. Government intervention, however, has largely been a response to the historical failure of the private insurance industry to provide adequate protection against correlated risks, a failure with the potential to generate underinvestment in land and devastate existing owners.

When data is available about the incidence and severity of potential disasters, improvements in technology have made it more feasible for insurers to calibrate premiums and discounts with greater accuracy, and sophisticated financial instruments not available until recent decades should be sufficient to provide insurers with the capital to overcome the correlated risk problems that might otherwise threaten their solvency. Government's primary role should be on the demand side, educating owners about the need to purchase insurance.

When reliable data is unavailable, as it is not for pandemics and economic crises, private insurance may remain difficult to obtain. Even then, the efficiency case for government intervention is plausible in two limited circumstances: when failure to compensate would cause damage to the broader economy, or when government has played a significant role in creating losses. The distributive justice case for compensation to landowners as a class is also weak, although there may be a stronger case for compensating owners of modest means who have suffered catastrophic losses due to events for which insurance was not available.

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INTRODUCTION

Among the many devastating effects of COVID-19 has been its impact on a significant subset of property owners. While residential property values soared in many areas outside of cities, owners of retail stores found little demand for their properties. Some were forced to limit the number of patrons they served, and even to shut down entirely. Residential landlords faced lost revenue when tenants lost their jobs and therefore the ability to pay rent. Government-imposed prohibitions on evictions exacerbated the lost revenue.

Property ownership always entails risk. Real estate markets ebb and flow. Tastes change. Interest rate variations make investment more or less attractive. These ordinary risks rarely provide occasion for government intervention. More controversial, however, is the appropriate government response to risks with the potential to cause catastrophic landowner losses: wildfires, hurricanes, earthquakes, terrorist attacks, financial meltdowns, and now, pandemics.

Government intervention in response to catastrophic risk can serve at least three functions. First, ex ante government action can reduce the likelihood that catastrophes will cause financial losses.¹ Second, government action can facilitate the spreading of losses in ways that reduce the likelihood of underinvestment in land. Third, from a distributional perspective, government action—either ex ante subsidization of insurance or ex post compensation to disaster victims—can be used to relieve hardship that landowners would otherwise suffer.

Government intervention, however, is not the only mechanism, and often not the best for accomplishing the first two objectives. Landowners can mitigate risk and ultimately spread losses through insurance. Insurers, in turn, can reduce the likelihood of catastrophic losses by reducing premiums for policyholders who take precautions.²

Catastrophic risk, however, presents challenges for the insurance industry. First, insurers have historically been wary of insuring against correlated risk.³ When risks are independent of one another—such as the risk that an electrical short will burn down my house and that a similar fire will leave my neighbor crosstown homeless—insurers need not maintain reserves sufficient to pay out simultaneous claims by all policyholders. The probability is that only a small fraction of owners will have claims in any given year.⁴ But a catastrophe like the

1. For instance, the government can restrict development in areas subject to natural hazards, either through outright prohibitions, or by imposing code standards that make buildings resistant to earthquakes or floods. *See, e.g.*, CAL. GOV'T CODE § 8894 (West 2023) (developing seismic retrofit guidelines).

2. *See* Donald T. Hornstein, *Lessons from U.S. Coastal Wind Pools About Climate Finance and Politics*, 43 B.C. ENV'T AFFS. L. REV. 345, 350 (2016); Robert H. Jerry, II, *Managing Hurricane (and Other Natural Disaster) Risk*, 6 TEX. A&M L. REV. 391, 410 (2019).

3. *See* Johannes Schoder, Peter Zweifel & Patrick Eugster, *Insurers, Consumers, and Correlated Risks*, 36 J. INS. ISSUES 194, 194 (2013).

4. *See* Jay M. Feinman, *What Is a Protection Gap? Homeowners Insurance as a Case Study*, 27 CONN. INS. L.J. 82, 96 (2020).

pandemic presents correlated risks; even if correlated losses occur rarely, all policyholders may suffer them at the same time, exhausting the insurer's available cash.⁵

Second, in the terminology made famous by economist Frank Knight,⁶ future pandemics, like other low-likelihood, high-damage events, present insurers with unquantifiable uncertainty rather than quantifiable risk.⁷ Insurers typically price premiums by quantifying risk from the data they have accumulated about past losses. In the absence of data on the likelihood that a peril will occur or the harm it might cause, insurers have less reliable information on which to base premiums. Without that information, some insurers may be unwilling to serve the market, and others may price premiums at levels landowners are unwilling to pay.

Finally, many landowners underestimate the likelihood of low-probability events and will therefore decline to buy insurance priced to reflect the best estimates about the frequency and severity of those events. The smaller the number of buyers, the less incentive insurers have to invest in calibrating premiums to reflect risk and in identifying strategies to reduce that risk. And, of course, when fewer landowners buy insurance, more landowners will ultimately suffer catastrophic losses.

In light of the challenges facing private approaches to catastrophic risk, considerable literature has developed on the appropriate government intervention. Some of that literature focuses on particular disasters, but some is more global in nature. On one side are those who argue that both ex post government compensation for losses and ex ante government subsidization of insurance reduce the incentive for owners to take precautions.⁸ On the other side are those who argue that government is in the best position to overcome the structural problems in the insurance industry.⁹

Earthquakes, floods, hurricanes, wildfires, terrorist attacks, financial meltdowns, and pandemics are all low-probability and high-consequence events. They differ, however, in significant respects. Although none of them can be predicted with precise accuracy, some are more foreseeable and more amenable to actuarial valuation than others.¹⁰ Private precautions may be available to avoid

5. See Daniel Schwarcz & Steven L. Schwarcz, *Regulating Systemic Risk in Insurance*, 81 U. CHI. L. REV. 1569, 1611 (2014) (noting insurer efforts to limit exposure to catastrophic risk out of concerns about liquidity).

6. FRANK H. KNIGHT, *RISK, UNCERTAINTY AND PROFIT* 21 (The Riverside Press Cambridge 1921).

7. See Michelle E. Boardman, *Known Unknowns: The Illusion of Terrorism Insurance*, 93 GEO. L.J. 783, 811–12 (2005) (noting that terrorism presents uncertainty rather than risk).

8. Richard A. Epstein, *Catastrophic Responses to Catastrophic Risks*, 12 J. RISK & UNCERTAINTY 287, 294 (1996); Omri Ben-Shahar & Kyle D. Logue, *The Perverse Effects of Subsidized Weather Insurance*, 68 STAN. L. REV. 571, 577 (2016).

9. Christopher C. French, *America on Fire: Climate Change, Wildfires & Insuring Natural Catastrophes*, 54 U.C. DAVIS. L. REV. 817, 850–51 (2020).

10. For instance, insurers may have particular difficulty estimating terrorism risk, both because terrorists seek to thwart prediction and because the government may have reasons to conceal information about terrorist risk. See Saul Levmore & Kyle D. Logue, *Insuring Against Terrorism – and Crime*, 102 MICH. L. REV. 268,

the losses associated with some disasters, but less available with respect to others. Government may play more of a role in creating some of the risks than others. And not all catastrophes have the same potential to spill over into the rest of the economy. A global, government approach to the problem of catastrophic risk may ignore these differences.

When substantial data is available about the probability and likely impact of a class of natural disasters, private contract, primarily through insurance, should generally be the primary mechanism for spreading risk. Private insurers have always had financial incentives to set premiums to reflect risk, and to provide appropriate discounts for owners who take optimal precautions.¹¹ Improvements in technology, however, made it more feasible for insurers to calibrate premiums and discounts with greater accuracy.¹² In addition, sophisticated financial instruments not available until recent decades should be sufficient to provide insurers with the capital to pay extraordinary claims without risk to their solvency. The government's primary role should be on the demand side, educating owners about the need to purchase insurance. One might expect institutional lenders, acting to protect their security interests, to fulfill that role by requiring more comprehensive insurance as a condition for mortgage loans. The government could, however, provide a nudge by requiring insurance as a condition for all government-backed loans.

Private insurance markets are unlikely to function as well when there is little or no claims experience with the catastrophe in question, or when government action has significantly influenced the catastrophe's effect.¹³ Government-provided insurance is likely to fare no better without a reasonable actuarial basis for computing premiums.

Aside from government-provided insurance, the government could provide ex post compensation to landowners unable to obtain ex ante insurance. The efficiency case for compensating owners for disaster-related losses is plausible in two limited circumstances: when failure to compensate would cause damage to the broader economy, or when government has played a significant role in creating losses, and compensation can serve as a force to discipline government.

298–99 (2003); see also Boardman, *supra* note 7, at 828–29 (distinguishing between terrorism and natural disasters).

11. See Hornstein, *supra* note 2, at 350 (noting that a properly priced insurance regime sends market signals to the insured to avoid risky undertakings or to adopt cost-effective precautions).

12. Insurers have turned to firms specializing in modeling catastrophe risks to assist them in deciding what to insure and at what price. See Howard C. Kunreuther & Erwann O. Michel-Kerjan, *Climate Change, Insurability of Large-Scale Disasters, and the Emerging Liability Challenge*, 155 U. PA. L. REV. 1795, 1828–29 (2007).

13. When the harm landowners suffer is the product of government action in response to a catastrophe, insurers face a moral hazard problem if they cover landowner losses. Owners may be less likely to lobby government to prevent the loss—or to compensate the victims—if the owners know that insurance will cover the loss. See Lawrence Blume & Daniel L. Rubinfeld, *Compensation for Takings: An Economic Analysis*, 72 CALIF. L. REV. 569, 593–94 (1984).

The corrective-justice case for ex post compensation is weak except to the extent that government action has caused the loss. The distributive-justice case for compensation to landowners as a class is also weak, though there may be a stronger case for compensating owners of modest means who suffered catastrophic losses due to events for which insurance was not available.

Part I explores the current interplay between government and private insurance in mitigating catastrophe-related losses suffered by landowners. Part II identifies the difficulties with exclusive reliance on private insurance to protect against those losses and discusses strategies, including limited government intervention for overcoming those difficulties. Part III focuses on the weakness of the case for general ex post compensation for landowners as a class, identifies limited exceptions, and argues that the Takings Clause offers an avenue for landowner compensation in some of the exceptional cases.

I. THE EXISTING LANDSCAPE

A number of sources provide landowners with relief from the impact of catastrophic events. When a Governor requests the President to declare that an event is a major disaster, the President may do so.¹⁴ The declaration triggers the availability of federal funds from the Federal Emergency Management Agency (FEMA) and other federal agencies. The focus of that federal assistance is on “meeting immediate threats to life and property.”¹⁵ Property owners may obtain assistance for repairs to existing properties,¹⁶ but that assistance is limited to \$25,000 per household.¹⁷ For more extensive repairs, owners must rely largely on private insurance, which might have been unavailable or expensive due to the correlated risk problem, or on government-sponsored insurance. This Part explores the current availability of insurance and other relief, which varies with the type of disaster involved.

A. FLOODING

Although coastal flooding has become a major concern in recent decades, rivers have historically been the principal source of flood-related risk.¹⁸ The federal government dealt with that risk by dispatching the Army Corps of Engineers to build levees and other public works projects.¹⁹ Insurance did not play a major role in mitigating risk, and a 1927 Mississippi River flood that extended over 2,000 miles dampened any interest the insurance industry had in

14. 42 U.S.C. § 5170.

15. *Id.* § 5170(b).

16. *Id.* § 5174(c)(2)(A) (providing assistance for repair of owner-occupied private residences, utilities, and residential infrastructure).

17. *Id.* § 5174(h)(1).

18. See Adam F. Scales, *A Nation of Policyholders: Governmental and Market Failure in Flood Insurance*, 26 MISS. C.L. REV. 3, 6 (2006).

19. *Id.*

providing flood insurance.²⁰ The scope of damage from the flood highlighted the correlated nature of the flood risk.

Although early insurance policies were targeted at single risks, by the 1940s and 1950s, the industry began to offer insurance against multiple perils, and ultimately “all risk” policies that provided protection against all perils except those explicitly excluded.²¹ By the 1960s, however, virtually all insurers excluded flood risk from noncommercial policies.²² The exclusion had multiple causes. Insurers had a limited understanding of hydrology, making it difficult to price insurance premiums.²³ In addition, flooding presented a correlated risk problem in certain geographical areas. Floods adversely affected large numbers of policyholders, stretching the capital resources of local and regional insurers.²⁴ Adverse selection might also have been a factor: if insurers had too little data to sort by flooding risk, they would face an unattractive market where only those owners who perceived themselves to be at the highest risk of flooding would be willing to pay the premiums insurers would have to charge.²⁵

In 1968, Congress stepped into the void and created the National Flood Insurance Program (NFIP).²⁶ NFIP had two principal objectives: first, incentivizing construction that would reduce flooding risks and second, providing flood insurance to individuals and businesses abandoned by private insurance carriers.²⁷ To reduce flooding risk, NFIP provided incentives for municipalities by making federally underwritten insurance available only in high-risk municipalities that implemented flood plan management programs designed to mitigate flood damage to new construction.²⁸

In terms of providing insurance, NFIP’s power to borrow from the federal treasury in years of heavy losses avoided the correlated risk problem facing private insurers.²⁹ When risks are correlated, a private insurer must have substantial capital available to cover flood losses in years of flood loss.³⁰ Since

20. *Id.* at 7.

21. Christopher C. French, *Insuring Floods: The Most Common and Devastating Natural Catastrophes in America*, 60 *VILL. L. REV.* 53, 60 (2015).

22. *Id.* at 61.

23. Scales, *supra* note 18, at 8.

24. French, *supra* note 21, at 63–64.

25. *Id.* at 61–62. Moreover, the very presence of insurance creates a moral hazard problem: insureds have less reason to take precautions once they have shifted the risk of loss. *Id.*

26. National Flood Insurance Act of 1968, Pub. L. No. 90-448, 82 Stat. 572 (codified as amended in scattered sections of 42 U.S.C.).

27. DIANE P. HORN & BAIRD WEBEL, CONG. RSCH. SERV., R44593, INTRODUCTION TO THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP) 2 (2021).

28. 42 U.S.C. § 4012(c). *See generally* HORN & WEBEL, *supra* note 27, at 2.

29. Congress has authorized FEMA to borrow up to a limit of \$30.425 billion to operate the NFIP. *See* HORN & WEBEL, *supra* note 27, at 26. That borrowing limit was increased from \$20.775 billion after Hurricane Sandy. *Id.*

30. *See generally* French, *supra* note 9, at 834 (noting that if an insurance company is not well capitalized and is exposed to correlated risks, the insurer is at risk for insolvency in the event of a natural catastrophe).

NFIPS's founding, the federal treasury has provided it with a ready source of capital.

Although NFIP attempted to provide insurance for new construction at actuarially sound rates, the program consistently provided explicitly subsidized insurance for two classes of owners: those whose properties were built before flood insurance rate maps were established for the property (pre-FIRM subsidies),³¹ and those whose properties were remapped into higher-risk zones after their homes were built in compliance with the standards applicable at the time (grandfathering subsidies).³² Even with these subsidies, NFIP did not begin to suffer significant losses until 2005, when Hurricane Katrina and two other storms caused massive devastation.³³ From then on, NFIP maintained significant debt to the treasury, with little prospect of repayment. Indeed, in 2017, Congress cancelled \$16 billion in NFIP debt in order to permit NFIP to pay claims arising out of that year's storms.³⁴ At least in part, the problem has been that flood maps have become out of date.³⁵ Climate change has increased the risk of flooding in many areas, and the process of updating maps has not kept up with those increased risks.³⁶ Attempts to update the maps meet political resistance because of the increased premiums that owners face with more realistic maps.³⁷

Congress made an effort to restore actuarial soundness to the flood insurance program with the Biggert-Waters Flood Insurance Reform Act of 2012.³⁸ That statute would have required FEMA to establish a reserve fund and phase out virtually all discounted premiums.³⁹ But when Hurricane Sandy caused massive flood losses, Congress enacted the Homeowners Flood Insurance Affordability Act of 2014,⁴⁰ which repealed the most significant provisions of Biggert-Waters even before they took effect. The political pressure for repeal was intense, because Biggert-Waters would have resulted in massive premium increases for many flood-prone properties.⁴¹

31. See HORN & WEBEL, *supra* note 27, at 16.

32. *Id.* at 19.

33. See U.S. GOV'T ACCOUNTABILITY OFF., GAO-17-425, FLOOD INSURANCE: COMPREHENSIVE REFORM COULD IMPROVE SOLVENCY AND ENHANCE RESILIENCE 8 n.19 (2017) (noting that NFIP's intermittent debt, reaching \$1 billion in 1997, had been paid off in subsequent years).

34. Additional Supplemental Appropriations for Disaster Relief Requirements Act, 2017, Pub. L. No. 115-72, § 308, 131 Stat. 1224, 1228.

35. See Ben-Shahar & Logue, *supra* note 8, at 588.

36. The Technical Mapping Advisory Council, established by Congress, estimates that producing a new FIRM is designed to take three to five years, and often takes more than six and a half years. See HORN & WEBEL, *supra* note 27, at 5-6.

37. Ben-Shahar & Logue, *supra* note 8, at 588.

38. Moving Ahead for Progress in the 21st Century Act, Pub. L. No. 112-141, 126 Stat. 405 (2012) (codified as amended in scattered sections of the U.S. Code).

39. See U.S. GOV'T ACCOUNTABILITY OFF., *supra* note 33, at 1-2.

40. Homeowner Flood Insurance Affordability Act of 2014, Pub. L. No. 113-89, 128 Stat. 1020 (2014) (codified at 42 U.S.C. §§ 4005, 4015, 4033, 4101d-4101e).

41. See Ben-Shahar & Logue, *supra* note 8, at 589.

As a result, even after Congress cancelled \$16 billion in NFIP debt, the program is still in debt to the Treasury Department by more than \$20 billion.⁴² NFIP's future revenues will almost certainly be insufficient to repay that debt. The result has been, and will continue to be, a significant socialization of the risk associated with ownership of flood-prone land. Opponents of the socialization emphasize that many of the beneficiaries are wealthy second home owners who own properties near the coast,⁴³ or focus on the significant percentage of NFIP funds paid out to repetitive loss properties.⁴⁴ Proponents argue that those who live in flood zones have, on average, lower income than those who live outside flood zones, and contend that most of those owners did not knowingly choose to accept the risk of flooding.⁴⁵

NFIP's socialization of risk, however, is only partial. First, owners pay premiums for flood insurance, even if those premiums are subsidized. Second, wealthy beachfront owners who suffer flood damage continue to bear much of the risk, because federal flood insurance is available only up to \$250,000 in loss for one to four family residential properties and \$500,000 for other residential and nonresidential properties.⁴⁶

B. HURRICANES

Hurricanes cause damage not only from coastal flooding, but also from devastating winds. Homeowner insurance policies have traditionally included coverage for wind damage.⁴⁷ Policies often include a special hurricane deductible, requiring the policyholder to share some of the hurricane risk with the insurer.⁴⁸ Moreover, the flood exclusion typically included in insurance policies provides additional protection to insurers: if a hurricane causes damage due to flooding from storm surge rather than from wind, the exclusion applies.⁴⁹ When wind and water work in tandem, some but not all courts have enforced anti-concurrent cause provisions in insurance policies.⁵⁰ Those provisions

42. HORN & WEBEL, *supra* note 27, at 26.

43. Ben-Shahar & Logue, *supra* note 8, at 609–11.

44. See Robin Kundis Craig, *Harvey, Irma, and the NFIP: Did the 2017 Hurricane Season Matter to Flood Insurance Reauthorization?*, 40 U. ARK. LITTLE ROCK L. REV. 481, 487 (2018) (noting that over a forty-year period, repetitive loss properties accounted for 1.3% of all NFIP policies but 25% of all claims, accounting for \$9 billion in total payments).

45. See, e.g., Alexander B. Lemann, *Assumption of Flood Risk*, 51 ARIZ. ST. L.J. 163, 186–87, 196–97 (2019).

46. HORN & WEBEL, *supra* note 27, at 8–9.

47. See Leslie Scism & Nicole Friedman, *What Homeowners Insurance Won't Cover If a Hurricane Hits*, WALL ST. J. (Sept. 8, 2017, 3:03 PM), <https://www.wsj.com/articles/what-homeowners-insurance-wont-cover-if-a-hurricane-hits-1504897428>.

48. See Nicole Friedman & Leslie Scism, *'Hurricane Deductibles' Shift Home-Repair Costs to Consumers*, WALL ST. J. (Sept. 6, 2017, 7:28 PM), <https://www.wsj.com/articles/hurricane-deductibles-shift-home-repair-costs-to-consumers-1504716893>.

49. See Scism & Friedman, *supra* note 47.

50. Compare *JAW The Pointe, LLC v. Lexington Ins. Co.*, 460 S.W.3d 597, 610 (Tex. 2015) (enforcing anti-concurrent causation provision when hurricane damage was caused both by wind and flood), and *Clarke v. Travco Ins. Co.*, No. 13-cv-5140, 2015 WL 4739978, at *8–9 (S.D.N.Y. Aug. 7, 2015) (same), with *Corban v.*

exclude liability if one of the concurrent clauses falls within a policy exclusion.⁵¹ And, of course, when it is uncertain whether wind or flood caused damage, trial may be necessary.⁵²

Nevertheless, the increase in hurricane activity over the last three decades has generated wind-damage payouts in excess of those insurers had previously anticipated.⁵³ In response, insurers threatened to abandon—and did abandon—a number of vulnerable markets.⁵⁴ In this case, governmental response came from the states, not the federal government. Several states established entities to provide wind insurance where private insurers cancelled insurance or refused to issue new policies.⁵⁵ Florida—the state most vulnerable to hurricanes—established the most ambitious plan.

Florida has established the Citizens Property Insurance Corporation (“Citizens”) to provide affordable property insurance.⁵⁶ Unlike a private insurer, which must set premiums to ensure adequate funds to pay when a catastrophe occurs, the Florida legislature gave Citizens the power to levy surcharges on future insurance policies to cover any deficits in Citizens’ accounts.⁵⁷ The Florida statute empowers Citizens to pledge the proceeds from any surcharges as security for bonds or other financing mechanisms necessary to satisfy claims.⁵⁸ Moreover, Citizens’ power to impose surcharges extends not merely to its own policyholders, but also to the policyholders who purchase insurance through private insurers.⁵⁹ Private insurers of course would not have comparable power to impose assessments on their competitors.

Because the assessments are imposed on all policyholders in the state and are not limited to those most susceptible to storm damage, the Florida statute effectively subsidizes those in the most storm-prone areas, at the expense of those in less vulnerable areas. The consequence may be to encourage

United Servs. Auto. Ass’n, 20 So.3d 601, 614–16 (Miss. 2009) (construing clause narrowly to find question of fact when wind and flood combined, although it was not clear which losses were caused by wind and which by flood).

51. See Peter Nash Swisher, “*Why Won’t My Homeowners Insurance Cover My Loss?*”: *Reassessing Property Insurance Concurrent Causation Coverage Disputes*, 88 TUL. L. REV. 515, 535–36 (2014).

52. See, e.g., *Ain v. Allstate Ins. Co.*, 181 A.D.3d 875, 878–79 (N.Y. App. Div. 2020); *Rosen v. U.S. Auto. Ass’n*, 104 So.3d 633, 641 (La. Ct. App. 2012) (reversing grant of summary judgment for insurer because questions of fact remained about whether damage was caused by wind and rain rather than flood water).

53. See Peter J. Sousounis, Roger Grenier, Jonathan Schneyer & Dan Raizman, *Climate Change Impacts to Hurricane-Induced Wind and Storm Surge Losses for Three Major Metropolitan Regions in the U.S.*, in HURRICANE RISK IN A CHANGING CLIMATE, 161, 161–205 (Jennifer M. Collins & James M. Done eds., 2022) (ebook).

54. See Christopher Flavelle, *Why Ian May Push Florida Real Estate out of Reach for All but the Super Rich*, N.Y. TIMES (Oct. 13, 2022), <https://www.nytimes.com/2022/10/13/climate/florida-real-estate-hurricane-ian.html> (noting that since Hurricane Andrew, most large national insurers have either dropped Florida or write few policies).

55. See Hornstein, *supra* note 2, at 357–58 (discussing state plans).

56. FLA. STAT. ANN. § 627.351(6)(a)(1) (West 2023).

57. *Id.* § 627.351(6)(b)(3).

58. *Id.* § 627.351(6)(b)(3)(e).

59. *Id.* § 627.351(6)(b)(3)(a)–(b).

overdevelopment in the very areas most prone to storms, because owners in those areas do not have to internalize the costs related to storm damage.⁶⁰

C. EARTHQUAKES

Standard homeowner policies do not cover earthquake damage.⁶¹ Earthquake insurance is available separately in most states, and premiums vary substantially by location and construction type.⁶² Although forty-two states have a reasonable risk of experiencing damaging earthquakes,⁶³ quakes are more common in the West, and over the last century, eight of the ten costliest earthquakes have occurred in California.⁶⁴

In 1984, California enacted a statute requiring insurers who sold homeowners insurance within the state to offer earthquake coverage.⁶⁵ In 1994, when the Northridge earthquake hit the state, insurers paid out more in claims than they had collected in earthquake premiums over the preceding thirty years.⁶⁶ Ninety percent of California insurers responded by withdrawing from the homeowner insurance market or by restricting sales.⁶⁷ Faced with the inability of homeowners to obtain homeowners insurance, the California legislature created the California Earthquake Authority (CEA) in 1996.⁶⁸

The legislation creating CEA gave insurers two options: an insurer could continue to offer earthquake insurance on its own, or it could become a CEA-participating insurance company and sell CEA policies at premiums set by CEA.⁶⁹ By the terms of the legislation, CEA itself would not become operational until it secured adequate initial capital.⁷⁰ Seventy percent of the residential property market had to commit to participate in the program, bringing in \$700 million in capital, and CEA had to obtain reinsurance contracts for twice that amount.⁷¹ Despite that capital commitment, a major earthquake in CEA's early years would have exhausted CEA's capital. The statute made a provision for an

60. See Carolyn Kousky, *Managing the Risk of Natural Catastrophes: The Role and Functioning of State Insurance Programs*, RES. FOR THE FUTURE, Sept. 2010, at 14.

61. *Background on: Earthquake Insurance and Risk*, INS. INFO. INST. (Dec. 2, 2021), <https://www.iii.org/article/background-on-earthquake-insurance-and-risk>.

62. *Id.* (noting that earthquake insurance for a frame house in the Pacific Northwest would cost between \$1 to \$3 per \$1,000 of coverage while a policy on the same house on the East Coast might cost less than 50¢ per \$1,000).

63. *Id.*

64. *Id.*

65. CAL. INS. CODE § 10081 (West 2023).

66. *Background on: Earthquake Insurance and Risk*, *supra* note 61.

67. Xiao Lin, *Risk Awareness and Adverse Selection in Catastrophe Insurance: Evidence from California's Residential Earthquake Insurance Market*, 61 J. RISK & UNCERTAINTY 43, 47 (2020).

68. CAL. INS. CODE § 10089.6 (West 2023).

69. See Lin, *supra* note 67, at 48.

70. CAL. INS. CODE § 10089.15 (West 2023)

71. *Id.* §§ 10089.14–.15. The legislation also required a ruling from the IRS that CEA was not obligated to pay income tax. *Id.* § 10089.14(a)(1). For a discussion of the preconditions, see generally Daniel Marshall, *An Overview of the California Earthquake Authority*, 21 RISK MGMT. & INS. REV. 73, 89–90 (2018).

assessment against the industry should such an event occur.⁷² Thankfully, the absence of a major earthquake over the last two decades has enabled CEA to build up capital, significantly reducing risk of a shortfall.⁷³ CEA also purchased substantial reinsurance⁷⁴ and issued catastrophe bonds to provide additional protection against any shortfall.⁷⁵ While CEA is a quasi-public entity, no public funds stand behind the insurance. In the event of a massive event causing a shortfall, CEA would make pro rata payments to earthquake victims.⁷⁶

Private insurance exists side-by-side with CEA insurance; CEA holds about 72% of the market with the rest held by private insurers.⁷⁷ Although CEA divided the state into nineteen zones reflecting different risk levels and provides incentives to policyholders who take steps to reduce earthquake risk, the evidence suggests that private insurers calibrate premiums to reflect risk more precisely.⁷⁸ Nevertheless, there appears to be relatively little comparative price shopping, because earthquake insurance is typically purchased as an add-on to homeowner's insurance. If a policyholder buys homeowners insurance from a CEA-participating insurer, the holder is unlikely to buy earthquake insurance from a separate insurer.⁷⁹

The statute that created the CEA provided an incentive for owners of older homes to retrofit their homes to increase their resistance to earthquakes.⁸⁰ Beginning in 2016, CEA dramatically increased retrofit discounts, with the largest discounts applicable to homes built before 1940.⁸¹ The discounts are based on the premise that retrofits are most helpful in older homes built before today's more stringent building codes.⁸²

Although earthquake insurance is readily available in California, decades of relative seismic calm have dampened enthusiasm for the product. In the years immediately following the Northridge earthquake, 31% of the California residential owners who had homeowners insurance purchased earthquake

72. Marshall, *supra* note 71, at 101.

73. *Id.* at 102.

74. *Id.* at 110.

75. See e.g., Press Release, Swiss Re Capital, Swiss Re Capital Markets Structures and Places USD 775 Million Catastrophe Bond for California Earthquake Authority, Further Protecting Californians Against Earthquakes (Oct. 23, 2020), <https://www.swissre.com/media/news-releases/nr-20201023-swiss-re-capital-markets-structures-places-usd-775-million-catastrophe-bond-california-earthquake-authority.html>.

76. CAL. INS. CODE § 10089.35(a) (West 2023).

77. Lin, *supra* note 67, at 46–47.

78. *Id.* at 27.

79. *Id.* at 24.

80. CAL. INS. CODE § 10089.40(d) (West 2023).

81. Marshall, *supra* note 71, at 103.

82. *Id.* (noting that the current codes were adopted in 1979; buildings built after that date already enjoy rates that reflect their greater resistance to earthquake-induced damage).

insurance.⁸³ By 2016, the percentage had dropped to below 11%,⁸⁴ though the percentage has increased modestly to almost 14% in recent years.⁸⁵ The decline is consistent with the premise that owners attach an excessive discount to low-probability, high-damage events.⁸⁶ The result is that in the event of a major earthquake, many owners will be unprotected.

D. WILDFIRES

Wildfires have ravaged states on the West Coast in recent years.⁸⁷ Fire has always been a central peril covered by property insurance policies.⁸⁸ Indeed, multi-peril homeowner insurance policies evolved from the single-peril fire insurance policies typically issued before World War II.⁸⁹ Although fires generally do not present correlated risk problems, extensive wildfires do: entire neighborhoods may be engulfed by the same fire. Nevertheless, homeowners insurance policies do not distinguish among causes of fires.⁹⁰ Wildfires are not, therefore, excluded from homeowners insurance coverage.

The increasing incidence of wildfires has required substantial payouts from insurance companies, and the 2018 California Camp Fire resulted in the insolvency of at least one insurer.⁹¹ One might expect insurers to respond by raising premiums to account for the greater wildfire risks associated with climate change, but California regulations make that option difficult. California requires that premiums be based on twenty years of prior claims data, not on future loss projections, limiting the ability of insurers to adapt to climate change.⁹² California laws also limit the right of insurers to cancel policies. An insurer may

83. See *Summary of 1996 Residential Market Totals*, CAL. DEP'T INS. (May 2002), <http://www.insurance.ca.gov/0400-news/0200-studies-reports/0300-earthquake-study/1996-2000/upload/1996-Summary-Data.pdf>.

84. See *Earthquake Premium and Policy Count Data Call: Summary of 2016 Residential Market*, CAL. DEP'T INS. (July 19, 2017), http://www.insurance.ca.gov/0400-news/0200-studies-reports/0300-earthquake-study/upload/EQ2016_SummaryWA.pdf.

85. *Earthquake Premium and Policy Count Data Call: Summary of 2020 Residential Market Totals*, CAL. DEP'T INS. (July 1, 2021), <http://www.insurance.ca.gov/0400-news/0200-studies-reports/0300-earthquake-study/upload/EQEXP2020SummaryWA.pdf>.

86. See Howard Kunreuther & Mark Pauly, *Rules Rather Than Discretion: Lessons from Hurricane Katrina*, 33 J. RISK & UNCERTAINTY 101, 105 (2006).

87. See *What's Behind California's Surge of Large Fires*, NASA EARTH OBSERVATORY (Sept. 13, 2021), <https://earthobservatory.nasa.gov/images/148908/whats-behind-californias-surge-of-large-fires> (noting that eight of the state's ten largest fires on record, and twelve of the last twenty, have occurred in the last five years).

88. Benjamin Franklin formed the first fire insurance company in the United States, the Philadelphia Contributionship, in 1752. *About Us*, THE PHILA. CONTRIBUTIONSHIP, <https://1752.com/about-us/history/> (last visited Feb. 23, 2023). The first multi-peril homeowners insurance policy was issued in 1950 and covered fire, among other perils. See Gulnar Nagashybayeva, *Homeowners Insurance*, LIBR. CONG. RSCH. GUIDES (Jan. 25, 2021), <https://guides.loc.gov/this-month-in-business-history/september/homeowners-insurance>.

89. See Nagashybayeva, *supra* note 88 (noting that INA introduced the first package homeowner's policy in 1950, replacing separate insurance for each peril).

90. Holly Yan & Chris Boyette, *Insurance Company Goes Under After California's Most Destructive Wildfire*, CNN, <https://www.cnn.com/2018/12/04/us/camp-fire-insurance-company-liquidation> (Dec. 4, 2018, 11:14 AM).

91. See French, *supra* note 9, at 834.

92. CAL. CODE REGS. tit. 10, § 2644.5 (2020); see French, *supra* note 9, at 834.

not drop a policyholder within two years after a covered disaster.⁹³ In addition, an insurer may not use the existence of a wildfire in the area as a basis for refusing to renew a property insurance policy for a period of one year after the declaration of a state of emergency in the area.⁹⁴

Although the moratorium on cancellations provided some protection to homeowners in high-risk areas, the time-limited moratorium leaves homeowners in fire-ravaged areas at risk of losing private insurance coverage after the moratorium's expiration.⁹⁵ Moreover, many insurance companies have declined to write new policies in areas prone to wildfires, and declined to renew existing policies in those areas that have not yet suffered a covered disaster.⁹⁶ Since mortgagee banks typically require mortgagors to maintain homeowners insurance, inability to obtain insurance presents a serious problem.

For those unable to obtain private insurance coverage, the California legislature created a "FAIR" plan that provides basic fire insurance coverage through a consortium of all providers of private homeowners insurance in the state.⁹⁷ Although all insurers are required to participate, those who continue to provide private insurance in high-hazard areas are proportionately relieved of their liability to participate in the FAIR plan.⁹⁸ FAIR plan policies have traditionally provided basic coverage only for fire-related losses, but the California Insurance Commissioner has recently ordered the plan to provide more traditional homeowners coverage.⁹⁹ The FAIR plan, however, is no panacea for homeowners, as rates have increased substantially with the increase

93. CAL. INS. CODE § 675.1(a)(3) (West 2023).

94. *Id.* § 675.1(b)(1).

95. See generally Leslie Kaufman, *Millions in Fire-Ravaged California at Risk of Losing Home Insurance*, L.A. TIMES (Sept. 26, 2021, 2:53 PM), <https://www.latimes.com/business/story/2021-09-26/california-fire-insurance-moratorium-expire> (noting that as many as 2.4 million homes were at risk of losing protection in 2021 as yearlong moratoria expired).

96. See Katherine Chiglinsky & Elaine Chen, *Many Californians Being Left Without Homeowners Insurance Due to Wildfire Risk*, INS. J. (Dec. 4, 2020), <https://www.insurancejournal.com/news/west/2020/12/04/592788.htm> (noting a 31% increase in refusals to renew in 2019 alone, and a 61% increase in zip codes with moderate to high fire risk).

97. CAL. INS. CODE § 10094 (West 2023). "FAIR" is an acronym for "fair access to insurance requirements." *Id.* § 10090(d).

98. *Id.* § 10094.2.

99. See Press Release, Cal. Dep't Ins., Growing Need for FAIR Plan Leads Insurance Commissioner to Order Increased Coverage Options (Nov. 14, 2019), <http://www.insurance.ca.gov/0400-news/0100-press-releases/2019/release089-19.cfm>. The FAIR plan challenged the Commissioner's order, but after a court held that the Commissioner had authority to order expanded coverage, the Commissioner again ordered the FAIR plan to provide that coverage. See Press Release, Cal. Dep't Ins., Insurance Commissioner Ricardo Lara Orders FAIR Plan To Offer California Homeowners Increased Coverage Options (Sept. 24, 2021), <http://www.insurance.ca.gov/0400-news/0100-press-releases/2021/release096-2021.cfm>.

in damaging fires.¹⁰⁰ In 2019 alone, the FAIR plan rate increase resulted in premium increases of 50% to 60% for policyholders in high-risk areas.¹⁰¹

E. TERRORISM

In addition to the tragic loss of life, the September 11, 2001, attacks on the World Trade Center and other targets inflicted massive damage to property.¹⁰² Congress immediately established a fund to compensate victims of the attacks and their survivors,¹⁰³ but private insurance covered most of the property damage.¹⁰⁴ Since much of the property damage was the result of fire (a covered peril under the existing policies), and the policies did not generally exclude losses due to terrorism, insurers and reinsurers bore much of the cost of the property damage, creating an industry-wide capital shortage.¹⁰⁵

In response to the financial distress, reinsurers and then insurers sought to flee the terrorism market, attempting to exclude terrorism losses from new policies.¹⁰⁶ Congress responded by enacting three statutes over a seven-year period, each prohibiting insurers from excluding terrorism losses, but relieving insurers of much of the burden of catastrophic terrorism losses.¹⁰⁷ Under the most recent amendment to The Terrorism Risk Insurance Program—which was extended most recently in 2019—the federal government pays 80% of terrorism losses after insurers meet a deductible.¹⁰⁸ To date, the federal government has never had to pay anything under the program.

100. See generally Yanjun Liao, Margaret A. Walls, Matthew Wibbenmeyer & Sophie Pesek, *Insurance Availability and Affordability Under Increasing Wildfire Risk in California* (Res. for the Future, Issue Brief No. 22-09, 2022).

101. CAL. STATE ASSEMB. INS. COMM., CALIFORNIA'S HOMEOWNERS' INSURANCE MARKET: A REPORT BY THE FAIR PLAN, Leg., 2d Sess., at 6 (2019), https://ains.assembly.ca.gov/sites/ains.assembly.ca.gov/files/hearings/Hearing%20Materials_082119.pdf [<https://perma.cc/J59W-3GY7>] (testimony of Clifton Brown, Vice President of Comm'ns & Gov't Relations, Surplus Line Ass'n of Cal.).

102. The New York City Comptroller estimated that the property losses to buildings in and around New York's World Trade Center totaled more than \$21.8 billion. See Patricia Grossi, *Property Damage and Insured Losses from the 2001 World Trade Center Attacks*, PEACE ECON., PEACE SCI. & PUB. POL'Y, 2009, at 1, 3, https://forms2.rms.com/rs/729-DJX-565/images/terr_911_grossi_2009.pdf.

103. The Initial Victim Compensation Fund that closed in 2004 distributed over \$7 billion to survivors of persons killed and to individuals injured in the attacks. See KENNETH R. FEINBERG, DEP'T OF JUST., FINAL REPORT OF THE SPECIAL MASTER FOR THE SEPTEMBER 11TH VICTIM COMPENSATION FUND OF 2001, at 1 (2001), <https://securitypolicy.syr.edu/wp-content/uploads/2012/09/Special-Masters-Final-Report.pdf>. Congress later reopened the fund that distributed almost \$9 billion from 2013 through 2021. See SEPT. 11TH VICTIM COMP. FUND, 20TH ANNIVERSARY SPECIAL REPORT 24 (2021), <https://www.vcf.gov/sites/vcf/files/media/document/2021-09/2021%20VCF%20Special%20Report.pdf>.

104. Grossi, *supra* note 102, at 14 (estimating that 57% of total losses were covered by insurance).

105. See Alexia Brunet Marks, *Under Attack: Terrorism Risk Insurance Regulation*, 89 N.C. L. REV. 387, 389 (2011). Reinsurers bore about two-thirds of the covered losses from the attacks. *Id.*

106. See Michelle E. Boardman, *Known Unknowns: The Illusion of Terrorism Insurance*, 93 GEO. L.J. 783, 787 (2005).

107. *Id.* at 788–89 (noting that the statutes required the federal government to bear 90% of losses once insurers exhausted deductibles and coinsurance).

108. Further Consolidated Appropriations Act, 2020, div. A, sec. 502, § 6701 note, 133 Stat. 2534, 3026 (Dec. 20, 2019) (codified as amended in scattered sections of the U.S. Code) (extending the termination date to

F. THE FORECLOSURE CRISIS

Although the “Great Recession” touched much of the American (and global) economy, a precipitous drop in real estate values was a core element of the crisis.¹⁰⁹ A variety of factors including predatory lending, abuses of the secondary mortgage market,¹¹⁰ and government policies designed to increase homeownership¹¹¹ contributed to significant demand among home buyers who did not have the resources to make monthly mortgage payments once their initial “teaser” rates expired. When the housing bubble burst, these homeowners lost whatever equity they had in their homes and became targets for dispossession through foreclosure.

Homeowner losses during the financial crisis involved no physical damage to the home, and the losses were not covered by insurance. The federal and state governments did, however, take steps to ameliorate some of the losses. The federal government’s Home Affordable Mortgage Program encouraged lenders to modify mortgage terms on mortgages already in or in imminent danger of default.¹¹² Additionally, the Home Affordable Refinance Program enabled homeowners who had not defaulted to refinance at lower interest rates even though they had little or no equity in their homes.¹¹³ But the biggest federal commitment to landowners harmed by the crisis came in the form of government guarantees of subprime mortgages. Between 2008 and 2010, the FHA guaranteed \$868 billion in loans to borrowers who would otherwise face unfavorable lending terms or would have been unable to borrow.¹¹⁴ One estimate of the value of those guarantees is over \$47 billion.¹¹⁵ Among the primary

2027). On the federal government’s 80% share, see generally *Background on: Terrorism Risk and Insurance*, INS. INFO. INST. (Nov. 4, 2021), <https://www.iii.org/article/background-on-terrorism-risk-and-insurance>.

109. See generally William W. Bratton & Adam J. Levitin, *A Tale of Two Markets: Regulation and Innovation in Post-Crisis Mortgage and Structured Finance Markets*, 2020 U. ILL. L. REV. 47, 54 (“[T]he financial crisis began with a housing bubble.”).

110. As Joseph Singer has put it, banks “made huge amounts of money marketing mortgages to people who could not afford to pay them back while offloading the risks of such deals onto hapless third parties.” Joseph William Singer, *Foreclosure and the Failures of Formality, or Subprime Mortgage Conundrums and How To Fix Them*, 46 CONN. L. REV. 497, 501 (2013).

111. See Bratton & Levitin, *supra* note 109, at 54–58; Angela M. DiIenno, *Government Housing Policy and the Failure of the GSEs*, 35 REV. BANKING & FIN. L. 782, 803–05 (2016).

112. For a more extensive description of the program, see Jonathan A. Marcantel, *Enforcing the Home Affordable Modification Program*, 70 N.Y.U. ANN. SURV. AM. L. 121, 129–34 (2014); Raymond H. Brescia, Elizabeth A. Kelly & John Travis Marshall, *Crisis Management: Principles That Should Guide the Disposition of Federally Owned, Foreclosed Properties*, 45 IND. L. REV. 305, 312–13 (2012) (noting that the program required participants to be current on their home loans but allowed them to refinance those loans even if they were underwater).

113. See Brescia et al., *supra* note 112, at 312.

114. Deborah Lucas, *Measuring the Cost of Bailouts*, 11 ANN. REV. FIN. ECON. 85, 99 (2019).

115. *Id.* The government bailout of Freddie Mac and Fannie Mae also included \$20 billion in costs incurred for new Freddie and Fannie originations in 2010. *Id.* at 96.

beneficiaries of these guarantees were homeowners seeking to refinance their mortgage loans.¹¹⁶

State legislation focused on delaying foreclosure proceedings to allow defaulting mortgagors to remain in their homes. Several states required foreclosing mortgagees to engage in mediation before proceeding to foreclosure.¹¹⁷ Other states mandated settlement conferences before mortgagees could obtain judgments of foreclosure.¹¹⁸ Still others enacted moratoria on foreclosure actions.¹¹⁹

G. PANDEMIC RELIEF

The COVID-19 pandemic was a boon to some landowners and a disaster for others. Real estate values skyrocketed in suburban and exurban areas as people sought escape from congested cities, but owners of commercial property faced losses as tenants vacated or stopped paying rent. Residential landlords were unable to collect rent from cash-strapped tenants, and eviction moratoria made it impossible to install rent-paying replacements, even if prospective tenants would have been willing to move in the midst a pandemic.¹²⁰ As with the financial crisis, the pandemic-related losses did not result from physical damage. Insurance did not cover most of the losses.

Some, but not all, landowner losses were directly related to government action. Although the virus itself would have substantially curtailed customer visits to restaurants and stores, government closure orders reduced traffic to zero for a period of time.¹²¹ Although residential landlords would have found it difficult to fill apartments with rent-paying tenants in light of the pandemic-related unemployment, eviction moratoria prohibited removal of delinquent tenants.

The federal government did provide some relief for landowners. Although rental assistance payments targeted low-income residential tenants adversely affected by the pandemic, many of those payments went to landlords in an effort

116. *Id.* at 96 (noting that primary beneficiaries were mortgage borrowers able to obtain funds on below-market terms).

117. See Aleatra P. Williams, *Foreclosing Foreclosure: Escaping the Yawning Abyss of the Deep Mortgage and Housing Crisis*, 7 NW. J.L. & SOC. POL'Y 455, 491–94 (2012) (discussing state programs).

118. See N.Y. C.P.L.R. 3408 (MCKINNEY 2017).

119. See, e.g., HAW. REV. STAT. § 667 (West 2023).

120. One element of the federal Coronavirus Aid, Relief, and Economic Security Act (CARES Act) was a 120-day eviction moratorium. Pub. L. 116-36, § 4024, 134 Stat. 281, 492–94 (codified at 15 U.S.C. § 9058). When Congress failed to renew the moratorium, the Centers for Disease Control (CDC) attempted to extend the moratorium, but the Supreme Court held that the CDC lacked statutory authority to do so. *Ala. Ass'n of Realtors v. Dep't Health & Hum. Serv.*, 141 S. Ct. 2485, 2490 (2021). Meanwhile, a number of states enacted moratoria that remained in effect after the federal moratorium expired. New York's eviction moratorium, for instance, did not expire until January 15, 2022. See 2021 N.Y. Laws 1214 (extending moratorium until January 15, 2022).

121. Data from the Bureau of Labor Statistics indicates that during the period through September 30, 2020, 56% of establishments experienced a decrease in demand for services, while 19% experienced a government-mandated closure. See *Business Response Survey to the Coronavirus Pandemic*, U.S. BUREAU LAB. STAT. (Sept. 2020), <https://www.bls.gov/brs/2020-results.htm>.

to compensate them for losses they suffered as a result of defaulting tenants.¹²² Since the federal legislation provided for state and local administration of rental assistance funds,¹²³ the process for obtaining funds varied by state, with administrative difficulties resulting in delayed payments.¹²⁴ Meanwhile, to deal with cash-flow difficulties that would have plagued owners, Congress established mortgage loan forbearance programs for federally backed mortgages.¹²⁵ Those programs allowed owners to delay, but not eliminate mortgage payments. Commercial landlords, however, were not a major focus of federal relief efforts, though they did benefit incidentally from payments made to businesses that kept workers on their payrolls.

II. INSURANCE AGAINST CATASTROPHE-RELATED LOSSES

Consider a world in which landowners were fully compensated for losses resulting from natural and other catastrophes. In that world, landowners could make development decisions without worrying about the risks associated with those catastrophes. That, in turn, would lead to a socially inefficient overinvestment in land subject to elevated catastrophic risk.

Conversely, risk-averse landowners would underinvest in land if they had to bear all the risk associated with catastrophes. Private or government-sponsored insurance provides the optimal vehicle for protecting against both under- and overinvestment, so long as insurance is priced to reflect the risks associated with the particular parcel of land.¹²⁶

There are, however, a number of obstacles to a properly functioning insurance market. This Part explores these obstacles and potential approaches to overcoming them.

122. The statute prioritized assistance to households whose income did not exceed 50% of area median income or households with one or more individuals who had been unemployed for at least ninety days prior to application. 15 U.S.C. § 9058a(c)(4). The statute also provided that payments would be made to lessors or utility providers unless those providers did not agree to accept payments. *Id.* § 9058a(c)(2)(C)(i)(1).

123. *See Id.* § 9058a(b)(1)(B) (defining eligible grantees as states and units of local government).

124. *See, e.g.*, ANITA YADAVALLI, LEOPOLD WILSON, PATRICK CHANG & WEN XI WONG, OFF. N.Y. STATE COMPTROLLER, REP. 7-2022: *New York State Rent Relief Funding: Spotlight on New York City 4-5* (2021), <https://www.osc.state.ny.us/files/reports/osdc/pdf/report-7-2022.pdf> (detailing New York's struggles to distribute assistance).

125. 15 U.S.C. §§ 9056-9057.

126. *See Kousky, supra* note 60 (noting that the price of property insurance sends a signal to owners, and that when the price is too low, homeowners do not internalize the cost of their decisions, leading to too much development).

A. THE OBSTACLES

1. *Information Deficits*

Achieving the insurance ideal of premiums that reflect risk depends on the existence of reliable data about the risks each landowner faces.¹²⁷ Of course, insurers can and do operate without that data,¹²⁸ but as the data becomes less reliable, premiums are likely to increase beyond the insurer's best estimate of probable loss.¹²⁹ Insurers will not generally risk large and unanticipated payouts if losses occur with greater frequency (or in greater magnitude) than the insurer's initial estimate.

The better the data available to insurers, the better insurance markets can function. Although weather-related data has become less reliable with the advent of climate change, more data is generally available about weather patterns than about terrorism, pandemics, or financial crises.¹³⁰

2. *Consumer Resistance*

If insurance premiums are substantially higher than the risk justifies, rational consumers will choose not to buy insurance even if they are risk averse. Further, most consumers are not in a position to assess risk accurately.¹³¹ Unlike insurers, who can spread research costs across all of their policies, it will rarely be worthwhile for an individual landowner to investigate all of the risks that might affect a single parcel of land.¹³² Landowners, therefore, might choose not to insure based on a seat-of-the-pants judgment that premiums are too high.

Evidence suggests that consumers generally discount low-probability, high-magnitude events.¹³³ That discount increases the likelihood that, given the choice, consumers would forego even reasonably priced insurance.¹³⁴ Moreover, some owners have a largely unwarranted belief that government will provide

127. See Kunreuther & Michel-Kerjan, *supra* note 12, at 1810 (noting that insurers need to identify, quantify, and estimate chances of an event occurring and extent of likely losses); see also Feinman, *supra* note 4, at 96 (explaining that for an insurer to calculate the cost of coverage, it must be able to predict with reasonable accuracy how likely it is that a risk will cause a loss, and how large that loss is likely to be); Scales, *supra* note 18, at 8 (explaining that without reasonably accurate data, insurance cannot be correctly priced).

128. Tom Baker, *Uncertainty > Risk: Lessons for Legal Thought from the Insurance Runoff Market*, 62 B.C. L. REV. 59, 106–07 (2021) (noting that the insurance industry regularly operates in the realm of uncertainty, and that a precise match between prices charged and losses incurred is rare).

129. See Howard Kunreuther, *The Role of Insurance in Reducing Losses from Extreme Events: The Need for Public-Private Partnership*, 40 GENEVA PAPERS RISK INS. 741, 748–49 (2015) (noting survey results indicating that premiums are 43% to 77% higher when insurers face ambiguous probabilities than when they face well-specified risk).

130. See Boardman, *supra* note 106, at 828.

131. See Kunreuther & Michel-Kerjan, *supra* note 12, at 1824 (noting that insurers who spend resources estimating risk have an informational advantage over policyholders).

132. Cf. Kunreuther & Pauly, *supra* note 86 (noting that potential hazard victims perceive the cost of getting information about low-probability, high-consequence events as highly relative to expected benefits).

133. See Hornstein, *supra* note 2, at 353; Scales, *supra* note 18, at 9–10.

134. See Kunreuther & Pauly, *supra* note 86.

substantial assistance in the event of a major disaster.¹³⁵ This exacerbates the problem: why pay for insurance if government rescue is available at no cost?¹³⁶ This is especially true for owners with modest financial resources—insurance against low-probability events may be a low-priority expenditure.

3. *Moral Hazard and Adverse Selection*

Although moral hazard and adverse selection are often cited as obstacles to the operation of efficient insurance markets,¹³⁷ neither is a major factor with respect to insurance against large-scale disasters. Moral hazard arises when an insured fails to take precautions because the existence of insurance reduces or limits the incentive to protect against risk.¹³⁸ With respect to natural disasters, however, insurers can guard against the moral hazard problem by calibrating rates to reflect the quality of construction and its ability to withstand storms, earthquakes, or fires, thus creating incentives for owners to take precautions that would reduce insurance rates.¹³⁹ Deductibles and coinsurance are other tools insurers can use to reduce moral hazard.¹⁴⁰

Adverse selection arises when potential purchasers of insurance have more information about their risk than insurers do, leading those with greatest risk to buy insurance at higher rates than low-risk customers.¹⁴¹ In the context of mass catastrophes, however, there is little reason to believe that landowners enjoy any informational advantage over insurers.¹⁴² As long as insurers can classify and price in accordance with risk, adverse selection should also not be a problem.¹⁴³

4. *Correlative Risk and Liquidity Concerns*

The most common forms of insurance involve a steady stream of policyholder claims. For example, the number of automobile accidents does not

135. Empirical evidence suggests that the number of owners who expect federal aid following a disaster may be small. *Id.* at 106.

136. See Epstein, *supra* note 8, at 296 (arguing that when people expect a bailout after the fact, they have fewer reasons to take precautions); Veronique Bruggeman, Michael Faure & Tobias Heldt, *Insurance Against Catastrophe: Government Stimulation of Insurance Markets for Catastrophic Events*, 23 DUKE ENV'T L. & POL'Y F. 185, 208–09 (2012) (noting that if people could count on compensation, they would have an incentive not to insure).

137. See, e.g., French, *supra* note 21, at 56.

138. See *id.* at 62.

139. See Hornstein, *supra* note 2, at 350 (arguing that a properly priced insurance regime sends price signals to insureds to adopt cost-effective precautions); Jerry, *supra* note 2, at 410 (noting that in an efficient market, insurers will incentivize policyholders to take steps to reduce the cost of natural disasters).

140. See Kunreuther & Michel-Kerjan, *supra* note 12, at 1825.

141. See Lin, *supra* note 67, at 2 (reasoning that for adverse selection to exist, people need to have some informational advantage over insurers).

142. See Kunreuther & Michel-Kerjan, *supra* note 12, at 1824 (explaining that insurers who spend resources estimating risk have an information advantage over policyholders, obviating adverse selection problems).

143. See Feinman, *supra* note 4, at 98. For a general discussion of insurance classification, see generally Kenneth S. Abraham, *Efficiency and Fairness in Insurance Risk Classification*, 71 VA. L. REV. 403 (1985).

oscillate widely from year to year.¹⁴⁴ Moreover, the likelihood that one insured driver will have an automobile accident in 2022 is not correlated with the likelihood that a neighbor will have an accident the same year. Similarly, the volume of expensive medical procedures rarely clump in any particular one year, and there is little correlation between the medical needs of one person and the medical needs of others. Accidents and medical procedures are more or less randomly distributed over geography and time. As a result, the premiums insurers collect in any year ordinarily suffice to pay that year's claims. If the premiums do not suffice, they come close.

Earthquakes, wildfires, hurricanes, terrorism, and pandemics may hit any one area infrequently, but when they do, they may generate claims by all policyholders in the area.¹⁴⁵ It may take premiums collected over many years to cover a single year's claims. The problem is particularly severe for insurers who operate in limited geographical markets.¹⁴⁶ In some cases, claims in a given year may exceed both the funds the insurer has on hand and its ability to borrow.¹⁴⁷ Major catastrophes have caused some insurers to fail and have induced others to depart from particular markets lest they meet the same fate with the next catastrophe.¹⁴⁸

B. STRATEGIES FOR OVERCOMING THE OBSTACLES

Insurers have developed a number of strategies for dealing with the correlated risk problem and some of the uncertainty surrounding catastrophic events. These strategies are better suited for some catastrophes than others. Moreover, insurers alone cannot deal with the problems of consumer resistance to insurance; overcoming that resistance may require some form of mandate. This Subpart explores the available options for making insurance a more valuable tool for spreading the risk of catastrophic events.

1. Reinsurance

Insurers can and do shed some of the risk they insure by purchasing reinsurance. Reinsurance is, in effect, insurance for insurers. Insurance companies enter into contracts with reinsurers under the terms of which the

144. For instance, during the six-year period between 2008 and 2013, the number of injuries from automobile accidents was never smaller than 2.21 million and never higher than 2.36 million—a variation of about 3% from the mean number (2.31) over that period.

145. See French, *supra* note 9, at 831 (noting that insurers have historically been reluctant to insure risks in situations in which numerous people in concentrated areas face the same risk of the same type of loss at the same time).

146. There are often geographical limits to the insurance pools across which insurers can spread losses because insurance is regulated at the state level. Hornstein, *supra* note 2, at 355–56.

147. See Kunreuther & Michel-Kerjan, *supra* note 12, at 1820 (explaining that insurers stop issuing policies when the risk of the loss of funds the insurer has on hand becomes too great).

148. French, *supra* note 9, at 834–35.

insurer transfers from its risk to the reinsurer.¹⁴⁹ Since reinsurance is a global business, reinsurers can diversify their risk portfolio in ways not available to purely domestic insurers.¹⁵⁰ For example, because the risk of a hurricane in Florida is not highly correlated with the risk of a tsunami in Japan, reinsurers who collect premiums in both markets—and pick up some of the risk in both markets—are less likely to suffer massive losses in any one year than a local insurer who concentrates on a single geographic market.

Reinsurance plays a major role in insuring against natural disasters. Of the \$90 billion in property losses caused by Hurricane Katrina, non–United States reinsurers paid \$55 billion.¹⁵¹ In some years, reinsurers pay half of all global catastrophe losses.¹⁵²

Reinsurance, however, is not a panacea. Significant-event losses dry up reinsurer capital, which the reinsurer has to replenish to be prepared for future catastrophes.¹⁵³ Capital providers, however, tend to be less willing to provide capital to reinsurers in the aftermath of major-loss events.¹⁵⁴ As a result, reinsurers leave some markets altogether, at least temporarily, after expensive disasters.¹⁵⁵ Moreover, the cost of reinsurance rises even when reinsurers remain in the market. Faced with the inability to purchase reinsurance at rates that reflect expected losses, primary insurers may mitigate their risk by issuing fewer policies.

2. *Catastrophe Bonds*

In recent decades, the insurance industry has turned to financial markets to assume some of the risks associated with natural disasters. Catastrophe bonds have become a particularly effective mechanism for the insurer or reinsurer to shed risk.¹⁵⁶

The bonds operate as follows. The insurer or reinsurer sells interest-bearing bonds with a specified maturity date to investors.¹⁵⁷ The insurer agrees to hold

149. See Qihao He, *Regulation by Government-Sponsored Reinsurance in Catastrophe Management*, 23 CONN. INS. L.J. 291, 293 (2017).

150. See Kunreuther & Michel-Kerjan, *supra* note 12, at 1827 (noting reinsurer ability to diversify geographically and by line of coverage); He, *supra* note 149, at 295 (noting that reinsurers can diversify losses across the world so that catastrophes may not impose unbearable losses when compared to their overall book of business).

151. He, *supra* note 149, at 295.

152. *Id.* at 296 (noting that reinsurers paid half of 2011's global catastrophe losses of \$110 billion).

153. *Id.* at 306.

154. *Id.*

155. For instance, several reinsurers abandoned the terrorism insurance market after the September 11, 2001, attacks. See Boardman, *supra* note 7, at 787. Over time, however, the private insurance market recovered even without government intervention. See Levmore & Logue, *supra* note 10, at 296.

156. Kunreuther & Michel-Kerjan, *supra* note 12, at 1827 (noting that as reinsurance prices increased due to disasters, insurers began issuing high-interest catastrophe bonds to attract capital).

157. See Veronique Bruggeman, *Capital Market Instruments for Natural Catastrophe and Terrorism Risks: A Bright Future?*, 40 ENV'T L. REP. NEWS & ANALYSIS 10136, 10140–41 (2010).

the insurance premiums it receives in trust.¹⁵⁸ The trustee pays interest to the noteholder, ultimately repaying the noteholder at maturity.¹⁵⁹ Repayment to the bondholder is, however, conditional. If the triggering event occurs, typically a named catastrophe that generates claims in excess of a specified threshold, the trustee will withhold payment of interest and principal.¹⁶⁰ If losses from the catastrophe do not exceed the threshold, the insurer or reinsurer bears the loss.

The catastrophe bond leads bond purchasers to bear some of the risk associated with the catastrophe. They are compensated for that risk with above-market interest rates.¹⁶¹ The ability of reinsurers to shed risk through sale of bonds tends to have a moderating effect on reinsurance premiums,¹⁶² even if the cost of capital—the interest rates on catastrophe bonds—may increase immediately after significant-loss events.¹⁶³

Catastrophe bonds have another advantage over traditional reinsurance policies: longer term coverage. While the typical reinsurance policy has a one-year time period, catastrophe bonds sometimes have a maturity longer than five years, which controls volatility in insurance prices.¹⁶⁴

3. Government-Provided Insurance

The government could overcome the correlative risk and liquidity issues that private insurers face by acting as the primary insurer against catastrophic risks. In particular, the federal government does not face the capital constraints of private insurers, because it has virtually unlimited power to borrow in times of stress. As a result, the government is in a far better position to spread risk across time than a private insurer.¹⁶⁵ That ability to spread risk over time essentially eliminates the correlated risk problem. If an earthquake will disrupt an entire area once every fifty years, the government can borrow in the one year the earthquake hits and spread the cost over the other forty-nine premium years—an option that might be impossible for private insurers because of liquidity constraints.

The federal government possesses other advantages over private insurers. The government accumulates more data on climate and geothermal events than

158. *Id.*

159. *Id.*

160. See Howard C. Kunreuther & Erwan O. Michel-Kerjan, *The Development of New Catastrophe Risk Markets*, 1 ANN. REV. RES. ECON. 119, 128 (2009). Some catastrophe bonds protect insurers if a series of unrelated catastrophes exceed a threshold amount, rather than focusing on a single catastrophic event. Kunreuther and Michel-Kerjan focus on a \$1.2 billion catastrophe bond issued by State Farm to cover events as diverse as hurricanes in Florida and earthquakes in Japan. See generally *id.* For a more complete description of the process, see Bruggeman, *supra* note 157, at 10140.

161. See Bruggeman, *supra* note 157, at 10140.

162. See *id.* at 10141.

163. Cf. Kunreuther & Michel-Kerjan, *supra* note 12, at 1830–31.

164. See Kunreuther & Michel-Kerjan, *supra* note 160, at 128 (noting that the average maturity is three years, with a number of five years or longer).

165. See Michael Faure & Klaus Heine, *Insurance Against Financial Crises*, 8 N.Y.U. J.L. & BUS. 117, 129 (2011) (noting that government can create cross-time diversification that the private market cannot achieve).

any private insurer could afford to collect on its own. The government would not have to build any return to investors on the premiums it might charge to potential insureds.¹⁶⁶ Additionally, the government can use cross-subsidies¹⁶⁷ to ease the financial burden of insurance on households that would otherwise elect not to buy insurance.

Nevertheless, experience suggests that even with these advantages, the government is not an ideal insurance provider. The absence of profit motive makes it less likely that the government will use its data to set premiums at optimal levels to reflect landowner risk and reward efficient precautions.¹⁶⁸ Moreover, since government data about most disasters becomes readily available to insurers, the government's data advantage is inconsequential.¹⁶⁹ In the case of terrorism, national security concerns will preclude sharing potentially relevant data with insurers, but it is far from clear that officials charged with national security would share that data with those charged with pricing government-provided insurance, obviating any informational advantage of government-provided insurance.¹⁷⁰

In addition, politics threatens to play an outsized role in setting insurance premiums. Although cross-subsidies might have distributional and political advantages, they threaten to incentivize inefficient decisions about development and precaution.¹⁷¹ For example, the NFIP is a poster child for the dangers of government-provided insurance. The only significant congressional effort to put the program on a sound financial footing quickly fell apart amidst constituent protests over dramatic premium increases.¹⁷² Moreover, although FEMA has data to update flood maps to reflect more recent climate information, politics has caused outdated flood maps to remain in place.¹⁷³ The result has been a

166. See French, *supra* note 9, at 850.

167. Cross-subsidization is the practice of charging higher prices to one type of insured to artificially lower the price for another group.

168. Cf. Scales, *supra* note 18, at 42 (noting that in the flood insurance context, the federal program has no competition and no incentive to prioritize remapping to reflect more accurate data).

169. Indeed, with respect to flooding in particular, private firms have developed flood mapping technologies that address some of the limitations in existing FEMA flood maps. See Erwaan Michel-Kerjan, Jeffrey Czajkowski & Howard Kunreuther, *Could Flood Insurance Be Privatized in the United States? A Primer*, 40 GENEVA PAPERS 179, 192 (2015).

170. Levmore & Logue, *supra* note 10, at 299.

171. Subsidies do not always work to benefit the disadvantaged. The Florida Citizens Property Insurance Corporation, Florida's sponsored alternative to private wind insurance, provides subsidies that accrue disproportionately to affluent households. Twenty-three percent of the properties that received subsidized flood insurance rates from NFIP are either vacation homes or year-round rentals. See Ben-Shahar & Logue, *supra* note 8, at 609–10.

172. The Biggert-Waters Flood Insurance Reform Act of 2012, Pub. L. No. 112-141, div. F, tit. II, subtit. A, 126 Stat. 405 (codified as amended in scattered sections of 42 U.S.C.), designed to reduce subsidies and increase actuarial soundness in federal flood insurance premiums, was largely undone two years later before it even took effect, when Congress passed the Homeowner Flood Insurance Affordability Act of 2014, Pub. L. No. 113-89, 128 Stat. 1020 (codified at 42 U.S.C. §§ 4005, 4015, 4033, 4101d–4101e). See generally Ben-Shahar & Logue, *supra* note 8, at 589.

173. See French, *supra* note 21, at 71.

disproportionate number of repetitive loss claims—perhaps reflecting homes that would never have been rebuilt if flood insurance had been based on actuarially sound principles.¹⁷⁴ Whatever the distributional attractions of the program's subsidies, the program has effectively subsidized inefficient development. Although some state-sponsored insurance programs have been marginally more successful, politics remains a threat to their ability to spread risk more efficiently.¹⁷⁵

The case is stronger for government involvement as a reinsurer, especially a reinsurer of last resort. With actuarially reasonable pricing, the insurance market would be able to take advantage of government capital to spread risk over time. Federal government resources might be especially useful for that purpose. Similarly, the government could reduce insurer fears of insolvency in the face of a major catastrophe by lending to insurers or reinsurers under specified conditions.

Some of the difficulties that arise when the government acts as the primary insurer could be ameliorated if the government instead functioned as a reinsurer.¹⁷⁶ If the government were marketing reinsurance to insurance companies and perhaps even to reinsurers, constituents might exert less political pressure to depart from an actuarially sound rate structure, because those constituents would not directly be paying the premiums. Government intervention in the terrorism insurance market, however, is not promising. By requiring the government to act as a backstop for insurers, in effect providing reinsurance for free, the Terrorism Risk Insurance Program generates a moral hazard problem. For instance, developers can construct skyscrapers in Manhattan without considering the full extent of terrorism risk.¹⁷⁷ For the government to realize its potential as a reinsurer, Congress would have to resist the temptation to provide subsidized rates at taxpayers' expense.

4. Government Regulation of the Insurance Market

Within the United States, states are the primary regulators of the insurance industry.¹⁷⁸ State regulation has the potential to provide marginal assistance in

174. One survey establishes that repetitive loss properties account for 25% of claimants under the national flood insurance program, even though they account for only 1.3% of insured properties. Over a forty-year period from 1978 to 2018, \$9.6 billion in claims were paid out to repetitive loss properties. See Robin Kundis, *Craig, Harvey, Irma and the NFIP: Did the 2017 Hurricane Season Matter to Flood Insurance Reauthorization?*, 40 U. ARK. L. REV. 481, 487 (2018). As of 2016, FEMA identified nearly 12,000 properties as severe repetitive loss properties. *Id.*; see also Scales, *supra* note 18, at 13 (noting that for years, about 1% of insured properties accounted for 30% of NFIP losses).

175. See Hornstein, *supra* note 2, at 357–77 (discussing various state “FAIR” plans).

176. For extensive discussion of a multi-layered approach with government providing a layer of reinsurance, see Faure & Heine, *supra* note 165, at 129; see also He, *supra* note 149, at 306 (noting problems with the reinsurance market that government intervention might overcome).

177. See Levmore & Logue, *supra* note 10, at 281.

178. The McCarran-Ferguson Act cedes to the states' regulatory authority over insurance except when Congress acts explicitly. 15 U.S.C. § 1012(b). The statute was enacted in 1945, in reaction to the Supreme Court's holding that the Sherman Act applied to the insurance industry. *Id.*

making insurance against catastrophes more available to landowners. But the primary objective of much regulation of the insurance industry—requiring insurers to have sufficient capital to pay claims as they arise¹⁷⁹—tends to dissuade insurers from insuring correlated risk and therefore reduces the availability of insurance against catastrophes.

Rate regulation is also likely to be counterproductive as a mechanism for increasing insurance availability against major disasters because private insurers will choose not to issue policies when regulated rates are insufficient to compensate for the risks insurers assume.¹⁸⁰ Many states have dealt with the problem by requiring insurers to participate in “FAIR plans” or their equivalent as a cost of doing business within the state.¹⁸¹ These consortiums offer insurance to those unable to purchase insurance on the private market. To the extent the consortium requirement is designed to overcome insurer aversion to correlated risk, it can expand the availability of insurance against catastrophes. But the consortium model generates a problem when it regulates rates and provides cross-subsidies from landowners in low-risk areas to those in high-risk areas: the cross-subsidies encourage and reward inefficient development in high-risk areas.

The Texas Windstorm Insurance Association (“TWIA”) model illustrates the cross-subsidies consortiums sometimes provide. TWIA provides significantly underpriced insurance in fourteen Texas coastal counties.¹⁸² TWIA calculates that its residential rates would have to increase by 39% for residential policies and by 46% for commercial policies to be actuarially adequate.¹⁸³ The model relies on post-event assessments to make up for shortfalls if a wind catastrophe occurs. The low rates themselves incentivize development in high-risk areas, especially because TWIA’s rates do not vary based on distance from the coast or other geographical factors.¹⁸⁴ The TWIA’s post-event assessments exacerbate that incentive because the assessments fall on insurance companies generally, forcing those in low-risk areas to pay for some of the losses incurred by coastal owners.¹⁸⁵

179. See Schwarcz & Schwarcz, *supra* note 5, at 1580 (noting that state regulation focuses on consumer protection, with one of the primary objectives as maintaining insurer solvency); see also Rick Swerdloff, *The New Regulatory Imperative on Insurance*, 61 B.C. L. REV. 2031, 2046–47 (2020) (noting that solvency regulation guards against fly-by-night insurers and guaranties that insurers will be able to pay legitimate claims); Kunreuther & Michel-Kerjan, *supra* note 12, at 1828.

180. For a recent example, see Leslie Scism, *California Fire Risks Lead Insurers To Pull Home Policies*, WALL ST. J., Jan. 20, 2022 at A10 (noting AIG pullout from the California market, and emphasizing insurer frustration with regulators who require that rates be based on historical loss experience rather than projections of future losses based on catastrophe modeling).

181. For a detailed description of several FAIR plans, see Hornstein, *supra* note 2, at 357.

182. See *TWIA Overview*, TEX. WINDSTORM INS. ASS’N, <https://www.twia.org/about-us/overview/> (last visited Feb. 23, 2023).

183. See *Rates*, TEX. WINDSTORM INS. ASS’N, <https://www.twia.org/rates/> (last visited Feb. 23, 2023).

184. See *id.*

185. See Hornstein, *supra* note 2, at 376–77.

5. Government-Mandated Insurance

Even when insurance is readily available, many landowners, if given the choice, will elect not to purchase it.¹⁸⁶ This phenomenon is not limited to property insurance. States mandate auto insurance coverage because some drivers would otherwise fail to insure. Similarly, some healthy individuals roll the dice and elect to go without health insurance. The Affordable Care Act attempted to overcome this problem with a combination of mandates and tax disincentives.¹⁸⁷ This Subpart examines the case for mandatory insurance against catastrophes.

Mandatory automobile insurance guards against the external costs an uninsured driver may inflict on innocent victims. Externality-based justifications do not, however, support mandatory insurance against catastrophic losses to property, because the loss from catastrophes is concentrated on the owner.¹⁸⁸ One who knowingly builds in a storm-prone area and then eschews expensive insurance to protect the investment bears the loss associated with the decision not to insure.¹⁸⁹ The owner signals a willingness to assume the risk in return for the pleasure of a beachfront home.

The decision to forego insurance, however, is rarely that simple. Perhaps the most common explanation is the discount owners routinely attach to low-probability, extensive-loss events.¹⁹⁰ Experience with California earthquake insurance is illustrative. Immediately after the 1994 Northridge earthquake, the percentage of owners who purchased earthquake insurance reached 33%, but declined to 12% by 2009.¹⁹¹ The risk of another earthquake did not change materially during that period, but as memories faded, consumer perception of

186. For instance, as already noted, only a small percentage of California owners purchase earthquake insurance. *See supra* notes 80–85 and accompanying text.

187. The Supreme Court sustained the Affordable Care Act's individual mandate as a constitutionally valid exercise of congressional taxing power, relying on the tax penalty imposed on those who failed to comply. *Nat'l Fed'n of Indep. Bus. v. Sebelius*, 567 U.S. 519, 567 (2012). In the Tax Cut and Jobs Act of 2017, Congress effectively repealed the tax penalty imposed on individuals who failed to comply. Tax Cuts and Jobs Act, Pub. L. No. 115-97, 131 Stat. 2054 (2017) (codified as amended in scattered sections of 26 U.S.C.).

188. In the case of commercial property, tenants and employees may suffer incidental losses. Tenants, however, may purchase insurance, and employees will typically be covered by unemployment insurance, mitigating the losses they suffer.

189. There may be some local externalities from an owner's inability or failure to rebuild after a catastrophe; others may choose not to build in a neighborhood market by dilapidated properties and vacant lots. *See* Levmore & Logue, *supra* note 10, at 300–01.

190. *See* Kunreuther & Mark Pauly, *supra* note 86, at 105–06 (noting empirical evidence that persons at risk do not seek out information on probabilities in making decisions on low-probability, high-consequence events, and, if probability is lower than a threshold level, do not worry about taking protective measures like purchasing insurance).

191. *The California Earthquake Authority*, INS. INFO. INST. 1–2 (2009), https://www.iii.org/sites/default/files/CEA_102009.pdf. In 2020, 13.77% of California residential owners had earthquake insurance. *Residential and Earthquake Insurance Coverage Study*, CAL. DEP'T INS. (2021), <http://www.insurance.ca.gov/0400-news/0200-studies-reports/0300-earthquake-study/upload/EQEXP2020SummaryWA.pdf>.

the risk diminished.¹⁹² Especially when owners have other pressing financial needs, it is easy to surrender to the hope that a catastrophe is so unlikely that planning for it is not worthwhile. Moreover, some owners, although not many, may assume that in case of disaster, the government will come to the rescue.

When the failure to purchase insurance against disasters is the product of consumer misperception, there is an efficiency case for mandating insurance coverage. A direct government mandate, however, would be difficult to administer and enforce.¹⁹³ Mortgage lenders, however, have a financial incentive to require insurance to protect their security interests. To the extent government-sponsored entities guarantee mortgages, they too have a financial stake. In fact, Fannie Mae requires lenders to insure that guaranteed mortgages be insured against most natural catastrophes, including, fire, windstorms, and areas prone to flooding and floods.¹⁹⁴ Curiously, however, Fannie Mae does not require earthquake insurance for residential mortgages, although it does for some commercial properties.¹⁹⁵

Enlisting lenders to enforce insurance mandates reduces administrative and enforcement costs, but it does not reach properties without a mortgage. There may, however, be no cost-effective ways to impose an enforceable insurance mandate on those owners. Moreover, at least some of the owners who can afford to own property without a mortgage may be those making a conscious decision to assume risk.

C. LIMITATIONS ON THE INSURANCE MODEL

Government intervention to ensure the availability and purchase of actuarially sound insurance against catastrophic events should generally provide optimal protection against over- and underinvestment in disaster-prone land. Limited intervention on the supply side may include acting as a reinsurer of last resort. On the demand side, the government might condition availability of government-backed mortgages on being a purchaser of adequate catastrophe insurance.

However, even if government intervention overcame imperfections in the insurance market, actuarially sound insurance would not address all concerns surrounding the impact of catastrophic events. First, it does not address

192. See generally Kunreuther & Pauly, *supra* note 86, at 107 (noting that only after occurrence of a disaster does the possibility of a similar low-probability event hit the consumer radar screen).

193. Some have suggested using real estate taxes to enforce a flood insurance mandate. See Michel-Kerjan et al., *supra* note 169, at 199. Real estate taxes in the United States are levied at the local level, making it difficult to enforce any state or federal level mandate through the thousands of tax-collecting municipalities across the country.

194. See *Selling Guide: B7-3-02, General Property Insurance Coverage (12/15/2021)*, FANNIE MAE (Dec. 14, 2022), <https://selling-guide.fanniemae.com/Selling-Guide/Origination-thru-Closing/Subpart-B7-Insurance/Chapter-B7-3-Property-and-Flood-Insurance/1032998291/B7-3-02-General-Property-Insurance-Coverage-12-16-2020.htm>.

195. See R.J. LEHMANN & DANIEL SEMELBERGER, R ST. INST., TAKE A LOAD OFF FANNIE: THE GSES AND UNINSURED EARTHQUAKE RISK 1 (2018), <https://www.rstreet.org/wp-content/uploads/2018/09/No.-151.pdf>.

affordability concerns. Second, adequate insurance may not be available for catastrophic events like pandemics and economic crises. The following Subparts explore those problems.

1. *Distributional Concerns*

Actuarially sound insurance premiums may create financial distress for owners of modest means whose property is located in high-risk areas. At least some of those owners may not have knowingly assumed those risks because the risks were not apparent at the time they acquired the property.¹⁹⁶ Concerns about saddling these owners with actuarially sound rates undoubtedly motivated states to mandate cross-subsidies that shift some of the insurance cost from owners of risk-prone properties to those whose property is more sheltered from risk.¹⁹⁷ These concerns certainly influenced federal rate-setting for flood insurance.¹⁹⁸

Cross-subsidies are common in some insurance markets, particularly health insurance, where healthy young insureds subsidize those who are older or sicker.¹⁹⁹ But cross-subsidies in health insurance are unlikely to have the same distortive effects they would have with respect to insurance against disasters. Subsidizing insurance for disaster-prone properties encourages overinvestment in those properties, while subsidizing health insurance has limited potential to encourage unhealthy lifestyles.

Christopher French has suggested that the affordability problem can best be addressed by bundling risks into a single comprehensive policy so that people in the East would be covered against wildfires, while residents of western states would be covered against flooding.²⁰⁰ This, French suggests, would allow for more affordable premium rates because those rates would be “based upon the risk for all covered perils, not just the single peril homeowners are at the highest risk of facing.”²⁰¹ But whether perils are bundled or not, the actuarially sound premium for a property with a heightened risk of a wildfire will reflect that risk, even if the risk of flooding is small. Bundling will only reduce rates if accompanied by cross-subsidies, with the concomitant potential to encourage inefficient investment.

Bundling, then, is an inefficient mechanism for addressing affordability concerns. If relief is warranted for owners who purchased without reason to know of emerging risks, or for owners in financial distress,²⁰² that relief would

196. See Lemann, *supra* note 45, at 197.

197. See generally Hornstein, *supra* note 2, at 357–77 (discussing cross-subsidies in state programs).

198. See French, *supra* note 21, at 70 (discussing grandfathered premium rates).

199. See Lemann, *supra* note 45, at 182.

200. French, *supra* note 21, at 62.

201. See French, *supra* note 9, at 857.

202. The overall distributional effect of cross-subsidies resulting from existing government policies is somewhat cloudy. Ben-Shahar and Logue note that the Florida wind insurance subsidies disproportionately benefit affluent households; with respect to federal flood insurance, 40% of subsidized properties are worth more than \$500,000, and 23% are vacation homes or year-round rentals. Ben-Shahar & Logue, *supra* note 8, at 610.

better come from taxpayers generally rather than by distorting the remainder of the insurance market, and should be phased out over a reasonably short period.²⁰³

2. *Terrorist Attacks, Financial Crises, and Pandemics*

Over the past twenty-five years, terrorist attacks, financial crises, and the COVID-19 pandemic have caused significant economic loss to landowners. Crises like these, however, present special problems that may restrict the availability of insurance as a device for limiting exposure to risk.

First, the absence of data about the frequency and magnitude of terrorist attacks, financial collapses, and pandemics presents a challenge to the insurance industry.²⁰⁴ The data available with respect to potential natural disasters is far from perfect, especially in light of climate change, but there is at least enough information available to permit insurers to develop science-based models about future events. Data presents a far more difficult problem with respect to terrorist attacks, financial crises, and pandemics.²⁰⁵

Financial crises and pandemics, although not terrorist attacks, present a second problem that distinguishes them from natural disasters: the economic loss they cause is not accompanied by physical damage to the premises. The absence of physical damage presents intertwined problems of causation and measurement. The loss associated with physical damage is relatively easy to measure: the cost of repairing or replacing the damaged structure. Causation is usually straightforward, except in the case of storms, where questions arise about whether damage was due to wind (a covered peril) or water (an excluded event covered only by federal flood insurance).²⁰⁶

With a pandemic, two determinations are more complicated: how much the owner has lost, and how much of the loss is due to the pandemic. For instance, if the owner continues to pay employees while the owner's business is closed, should losses be measured by a reduction in gross sales, or should avoidable employee costs be subtracted? If business does not pick up as the pandemic ebbs, does that establish that the owner's losses would have occurred even without the pandemic, or is part of the loss attributable to a change in buying habits wrought

Lemann, by contrast, focuses on the fact that those who live in flood zones have lower incomes than those outside of flood zones. Lemann, *supra* note 45, at 187.

203. See generally Kunreuther, *supra* note 129, at 751 (arguing that special treatment for low-income individuals should come from general public funds and not through premium subsidies, and that any subsidies should be limited to existing residents, not those who locate in the future); see also Scales *supra* note 18, at 45 (suggesting phase-out of location-specific subsidies and limiting other subsidies based strictly on income).

204. See Faure & Heine, *supra* note 165, at 122 (noting that insurance against financial crises is problematic because of the absence of reliable statistical data); see also Boardman, *supra* note 10, at 828 (citing absence of actuarial data as a critical distinction between terrorism and natural disasters).

205. With respect to terrorist attacks in particular, national security issues would make it difficult for insurers to obtain data even if the government had relevant data about the likelihood of future attacks: the government would be unwilling to share the data, and the data's relevance would pass before insurers had the ability to use it. See Boardman, *supra* note 10, at 829; see also Marks, *supra* note 105, at 441.

206. See Jerry, *supra* note 2, at 428 (noting that wind and water often act concurrently and that some policies include anti-concurrent cause provisions).

by the pandemic? Many of the same issues arise when the owner's losses result from a financial crisis. Insurers do offer business interruption insurance, but that insurance is typically tied to physical damage to the premises, mitigating the causation problems that arise when losses result from pandemics or financial crises.²⁰⁷

Perhaps the most important obstacle to the use of insurance to guard against losses resulting from financial crises and pandemics is the correlated risk problem. Because events like these affect the entire country and indeed the whole world at precisely the same time, neither insurers nor reinsurers are likely to be willing or able to maintain the capital or borrowing power to finance payments for these losses.²⁰⁸ The global impact of these disasters stands in sharp contrast to storms, earthquakes, wildfires, floods, and even terrorist attacks,²⁰⁹ all of which affect geographically discrete areas, even if those areas are substantial. Insurance, then, does not provide a feasible mechanism for shedding the risk associated with these crises.

III. POST-EVENT RELIEF

Some disaster-related losses are not covered by insurance, either because the event was not insurable or because the affected owner did not purchase insurance. Thus, questions arise about whether government should provide relief to disaster victims. This Part explores these questions.

A. THE CASE AGAINST POST-EVENT RELIEF

1. Moral Hazard

The government is in the best position to spread losses from catastrophes by compensating all the victims for their losses. Compensation from tax dollars would essentially hold victims harmless for the misfortunes that they suffer, while everyone would share in the loss. The problem is that this sort of post-event disaster relief has the potential to generate two sorts of moral hazard. First, post-event compensation encourages inefficient development of disaster-prone properties.²¹⁰ If owners know post-event relief will be available, they have every

207. The COVID-19 pandemic generated considerable litigation in which courts have typically held that business losses are not covered because the pandemic caused no physical damage to the insured's property. *See, e.g.,* *Lansdale 329 Prop, LLC v. Hartford Underwriters Ins.*, 537 F. Supp. 3d 780, 788 (E.D. Pa. 2021); *Sharde Harvey, DDS v. Sentinel Ins. Co.*, No. 20-CV-3350, 2021 WL 1034259, at *5 (S.D.N.Y. Mar. 18, 2021).

208. *See* Swerdloff, *supra* note 179, at 2039 (discussing the correlated risk problem with respect to the pandemic); Faure & Heine, *supra* note 165, at 124 (noting that damage from a financial crisis may exceed the capacity of insurers and reinsurers); Faure & Heine, *supra* note 165, at 131 (contrasting worldwide impact of financial crises with the more limited reach of natural disasters).

209. Some terrorist attacks—cyberterrorism in particular—would not be limited to a single geographical area, but those attacks would not affect landowners in particular.

210. *See* Levmore & Logue, *supra* note 10, at 281; Bruggeman et al., *supra* note 136, at 208 (noting that ex post relief does not provide owners with incentives to take precautions); Epstein, *supra* note 8, at 294 (same); Faure & Heine, *supra* note 165, at 131 (same).

reason to make inefficient investments in disaster-prone properties because they will not bear all downside risk associated with the property.

Second, the availability of post-event relief reduces the incentive to purchase insurance.²¹¹ The result, once again, would be shifting risk from purchasers of risk-prone land to taxpayers more generally. Some studies suggest that few owners count on government relief even after major disasters and therefore do not make decisions based on availability of that relief.²¹² Conversely, the volume of repeat claims by purchasers of subsidized flood insurance indicates that owners will make significant investments in risky properties when they believe the government will shoulder some of the downside risk.²¹³

Moral hazard, however, is less of a problem with respect to catastrophic events that are not insurable and not amenable to precautions. Moral hazard does not counsel against post-event relief with respect to pandemics or, for most landowners, financial crises.²¹⁴

2. *Fairness Concerns*

Perhaps a more comprehensive objection to post-event relief is that neither principles of corrective justice nor principles of distributive justice warrant relief payments from taxpayers to landowners victimized by traumatic events. Corrective justice relief is generally premised on wrongful action for which the wrongdoer must compensate victims.²¹⁵ But, subject to exceptions considered below, most catastrophic events are not the product of government action. Victims have no more corrective justice basis for government reparations than the victims of lightning strikes, automobile accidents, or genetic illnesses.

Although the content of distributive justice principles is contested,²¹⁶ no coherent set of those principles would justify post-event compensation to all landowners for disaster-related losses. Many if not most landowners are wealthier than a significant segment of the general population. Using taxpayer money to compensate all landowners would therefore be difficult to justify as a measure designed to reduce wealth disparities. A different kind of distributive justice claim, based on the principle that events beyond a person's control should not affect his or her wealth, would prove too much. Events beyond an

211. See Levmore & Logue, *supra* note 10, at 309; Bruggeman et al., *supra* note 136, at 208–09.

212. See Kunreuther & Pauly, *supra* note 86, at 106.

213. See Craig, *supra* note 44, at 487 (“Repetitive-loss properties . . . account for just 1.3 percent of all policies but are responsible for fully 25 percent of all NFIP claim payments since 1978.”).

214. With respect to financial crises, the prospect of bailouts may create a moral hazard issue with respect to some participants in financial markets. See Faure & Heine, *supra* note 165, at 131. That moral hazard, however, is unlikely to extend to most landowners affected by the economic crisis.

215. See Jules Coleman, *Risks and Wrongs*, 15 HARV. J.L. & PUB. POL’Y 637, 645 (1992) (“[C]orrective justice imposes a duty to repair on those individuals who have wronged or wrongfully injured others.”).

216. For a discussion of different distributive justice principles, including libertarian principles and different egalitarian distributive justice principles, see Kyle D. Logue, *Reparations as Redistribution*, 84 B.U. L. REV. 1319, 1342–45 (2004).

individual's control—parentage, physical and mental attributes, lightning strikes—all affect wealth and well-being.²¹⁷ Without compensation for the consequences of these accidents, it is difficult to use disaster-related misfortunes as a basis for a distributive justice claim.

3. *Administrability and Transparency*

Even if one were to conclude that fairness principles support post-event disaster relief, administering a compensation scheme would present significant challenges. Compensation systems do not administer themselves. They require a cadre of administrators to evaluate individual claims of disaster victims. The staff of a standing administrative agency is unlikely to be large enough to process an extraordinary volume of claims in a timely fashion. FEMA's handling of funeral assistance claims for families who lost loved ones during the COVID-19 pandemic illustrates the problem. FEMA hired 4,000 contractors, often with no background, to deal with the claims and provided them with seventy pages of scripts and instructions.²¹⁸

Administration problems are not simply problems of cost and delay. As the number of decisionmakers expands, equal treatment of victims becomes more difficult to ensure. Of course, the agency can provide individual decisionmakers with general principles to apply in making compensation decisions, but applying those principles to the disparate circumstances of individual victims will require the exercise of judgment by frontline decisionmakers. Absent a review process, which would entail additional cost and delay, inconsistencies in treatment are certain to arise. Those inconsistencies may be unfair in themselves, but will also demoralize victims unable to understand why others have been treated more favorably than they have.

B. THE CASE FOR TARGETED RELIEF

When an unanticipated disaster occurs, insurance proceeds do not deal with the immediate needs of landowners and other victims. The government is in a better position to marshal resources to provide immediate emergency and housing assistance—a major component of relief that FEMA provides.²¹⁹ FEMA's emergency assistance, however, does not target landowners, but rather anyone dislocated by the disaster.²²⁰ This Subpart examines the case for post-event compensation to landowners for losses suffered as a result of a catastrophe or crisis.

217. *Id.* at 1344–45 (discussing “luck egalitarianism”).

218. See Hannah Dreier, “My Sincere Condolences”: Inside the Struggles and Heartaches of FEMA's Massive Covid Funeral Assistance Program, WASH. POST, Dec. 21, 2021, at A1.

219. 42 U.S.C. § 5174(b)–(d).

220. Eligible recipients are “individuals and households who are displaced from their predisaster primary residences or whose predisaster primary residences are rendered uninhabitable.” *Id.* § 5174(b)(1).

1. *Relief To Ameliorate the Impact on the Local or National Economy*

The federal bailout of big banks during the 2008 financial crisis is an obvious example of government relief protecting the economic health of people other than the direct recipients of government largesse.²²¹ One might make a similar case for landowners in some circumstances: if landowners do not have funds to rebuild after a catastrophe, the resulting failure to restore will depreciate the value of neighboring properties that were not damaged or were restored.²²² State law enactments to restrict foreclosures after the financial crisis rested in part on a similar concern about the effects a glut of foreclosures might have on the housing market.²²³

Compensation to reduce external effects, however, raises the moral hazard problem already discussed: it reduces the incentive for all potential victims to guard against disasters by taking precautions, insuring, or reducing investment in hazard-prone areas.²²⁴ Relief may nevertheless be appropriate on an externality-reduction theory, especially in cases like terrorist attacks and pandemics, where the event is not easily foreseen and where insurance may be unavailable. But once government starts invoking the effect on the broader economy as a rationale for ex post compensation in those cases, the risk increases that victims of other catastrophes will invoke the same rationale even in cases where insurance and precautions are available. The political branches may find it difficult to distinguish the cases and resist the pressure, even though compensation in these cases may, in the long run, reduce the incentive to insure and take efficient precautions.²²⁵

2. *Relief of Poverty*

Disasters can cause homelessness for both the rich and the poor. The rich are more likely to have insurance and other resources that will enable them to recover more quickly. The poor, by contrast, are less likely to be able to recover on their own. Moreover, the poor may be more likely to own property in areas where low prices reflect vulnerability to harm. Hurricane Katrina's devastation

221. See, e.g., Adam J. Levitin, *In Defense of Bailouts*, 99 GEO. L.J. 435, 438 (2011) (arguing that systemic risk—"the risk that individual firms' failures will result in a socially unacceptable impact on the broader economy"—cannot be addressed solely through ex ante regulation, and sometimes requires an ex post bailout); Anthony J. Casey & Eric A. Posner, *A Framework for Bailout Regulation*, 91 NOTRE DAME L. REV. 479, 536 (noting that bailouts will sometimes be necessary to prevent macroeconomic collapse).

222. See Lauren E. Willis, *Will the Mortgage Market Correct? How Households and Communities Would Fare If Risk Were Priced Well*, 41 CONN. L. REV. 1177, 1202 (2009) (noting decline in quality of life for neighbors when foreclosed-upon houses are poorly maintained).

223. For instance, the preamble to Maine's statute mandating mediation of foreclosure claims includes, in a "Whereas" clause: "homeowners are expected to have continued problems selling their properties at the value of their mortgages due to falling housing prices," and "foreclosures contribute to the decline in the State's housing market." Act of June 15, 2009, ch. 402, 2009 Me. Laws 1188.

224. Cf. Casey & Posner, *supra* note 221, at 524–25 (discussing moral hazard problem when people can predict who will receive bailouts with reasonable accuracy).

225. See generally Levmore & Logue, *supra* note 10, at 281.

of New Orleans's Lower Ninth Ward provides a vivid illustration. Before Katrina, the Lower Ninth Ward was relatively poor and 99% black, with the highest percentage of black homeownership in the city.²²⁶ A decade after the storm, while more than half of New Orleans neighborhoods had recovered 90% or more of their pre-storm population, the Lower Ninth Ward had recovered only 37% of its pre-storm population, and vacant lots outnumbered occupied ones.²²⁷

Providing a social safety net has long been an accepted function of government. The difficulty arises when government money is used to rebuild homes in neighborhoods poised for destruction by yet another catastrophe. Local political pressure to rebuild may be fierce, but in some circumstances, funds used to relieve landowner poverty might better be accompanied by a prohibition on rebuilding. For instance, the government could condemn homes in precarious areas and pay pre-disaster value to the owners.²²⁸

3. *Government Contribution to Landowner Loss*

The federal and state governments sometimes play a role in the losses landowners suffer as a result of disasters. Government construction and maintenance of flood control projects may increase the risk of flooding in areas other than those benefited by the project.²²⁹ In an effort to tame a wildfire, the government may start a controlled burn to deprive the main fire of fuel.²³⁰ The controlled burn, however, may cause harm to landowners who might not otherwise have been reached by the wildfire. During the COVID-19 pandemic, the government issued shutdown orders and imposed eviction moratoria.²³¹ These measures were designed to reduce the pandemic's spread and to protect those who lost their incomes as a result of the pandemic, but they also inflicted losses on landowners who were unable to run their businesses or collect rent.

In these situations, how much responsibility the government bears for landowner losses often presents difficult proof questions, especially in the case of natural disasters. A landowner who buys and builds in an area prone to wildfires and floods takes risks that other landowners avoid. When disaster strikes, it will often be difficult to establish that the property would have been spared but for the government's actions. Even when the government orders a shutdown during a pandemic, it is not easy to separate landowner losses due to

226. Patrick S. Roberts, *Social Capital and Disaster Resilience in the Ninth Ward*, OñATI SOCIO-LEGAL SERIES (forthcoming) (manuscript at 9), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3245782.

227. *Id.* (manuscript at 10).

228. *Cf.* Becky Hyatt & Robert Moore, *Addressing Affordability and Long-Term Resiliency Through the National Flood Insurance Program*, 45 ENV'T L. REP. 10338, 10344 (recommending that property owners be given the option of subsidized flood insurance if they agree to be bought out if a future disaster occurs).

229. *See* St. Bernard Par. Gov't v. United States, 887 F.3d 1354, 1358 (Fed. Cir. 2018).

230. *See* Shelly Ross Saxer, *Paying for Disasters*, 68 KAN. L. REV. 413, 442 (2020).

231. *See, e.g.*, N.J. Exec. Order No. 104 (Mar. 16, 2020), <https://nj.gov/infobank/eo/056murphy/pdf/EO-104.pdf> (requiring closing of casinos, racetracks, and gyms, and limiting restaurants to delivery and takeout services); N.J. Exec. Order No. 106 (Mar. 19, 2020), <https://nj.gov/infobank/eo/056murphy/pdf/EO-106.pdf> (imposing eviction moratorium).

the government's order from losses resulting from consumer unwillingness to frequent the affected establishments. When the government imposes an eviction moratorium, how much rent a landlord loses depends in part on the willingness of prospective rent-paying tenants to move during a public health crisis.

Nevertheless, at least in some cases, an owner will be able to surmount proof problems, at least with respect to some of the losses suffered in the wake of government action. The question then becomes whether those losses should be borne by the landowner or by taxpayers—an issue that is often central to Takings Clause doctrine. But even if the Takings Clause does not mandate compensation, landowners who suffer disproportionate harm from government action have a reasonable claim on government resources, at least where they could not have contemplated and insured against the government action that caused the harm.

C. MECHANISMS FOR TARGETED COMPENSATION

In some cases where landowners deserve targeted compensation, litigation through the Takings Clause provides a mechanism for obtaining that compensation. Takings litigation, however, is an expensive and unattractive option for many landowners—especially when relief of poverty furnishes the underlying justification for post-event compensation. After examining Takings Clause doctrine as an avenue for relief, this Subpart turns to administrative mechanisms for providing ex post compensation.

1. *Takings Clause Doctrine as a Source of Relief*

The Takings Clause's compensation requirement serves multiple interrelated purposes. One sounds in fairness: compensation bars “government from forcing some people alone to bear public burdens which, in all fairness and justice, should be borne by the public as a whole.”²³² Others focus on efficiency. Compensation may incentivize government to internalize the cost associated with decisions that inflict harm on owners.²³³ In some circumstances, a compensation requirement also reduces the potential that owners will underinvest in land.²³⁴ Together, however, these justifications support post-event compensation under the Takings Clause only in limited circumstances.

The cost-internalization justification assumes that government entities act like wealth-maximizing private actors, and will therefore consider the costs associated with their actions only if required to compensate those harmed by the actions.²³⁵ The assumption that government behaves like private actors has,

232. *Armstrong v. United States*, 364 U.S. 40, 49 (1960).

233. The premise behind the cost-internalization argument is that government officials discount the costs of their actions, unless they appear explicitly as a budgetary expense. See Blume & Rubinfeld, *supra* note 13, at 621.

234. *Id.* at 582–89.

235. *Id.* at 621.

however, long been subject to trenchant criticism.²³⁶ While it is certainly true that requiring compensation to victims of government action will lead the government to consider the effect of its action on those victims, it does not follow that the government will ignore those interests in the absence of a compensation requirement. If those victims have political influence or power, government officials have electoral incentives to consider their interests independent of any government liability rule.²³⁷

Assume the cost-internalization justification for compensation retains some validity when the government makes a calculated decision to acquire property or restrict its use. The likelihood that a compensation requirement will lead government to weigh costs and benefits more accurately becomes less plausible when the possibility of an event that triggers compensation—and its potential magnitude—is uncertain. Consider *St. Bernard Parish Government v. United States* as an example.²³⁸ Property owners adversely affected by flooding wrought by Hurricane Katrina sued the federal government, contending that the federal government's construction and operation of the Mississippi River-Gulf Outlet ("MRGO") caused the flooding and constituted a temporary taking of their property. It is nearly inconceivable that, when deciding on construction and maintenance of the MRGO project, the Army Corps or anyone else in government would have factored in the need to provide compensation to landowners who would be adversely affected by an event like Katrina—especially when the Corps had already constructed levees to protect those properties.

Of equal importance, to the extent a compensation requirement does promote internalization of costs, requiring compensation for losses resulting from government action would skew decisionmaking in favor of inaction. The result, Christopher Serkin has emphasized, could lead to inefficient decisionmaking.²³⁹

In some circumstances, existing takings case law may require the government to bear financial responsibility for actions that contribute to

236. See Ronit Levine-Schnur & Gideon Parchomovsky, *Is the Government Fiscally Blind? An Empirical Examination of the Effect of the Compensation Requirement on Eminent-Domain Exercises*, 45 J. LEGAL STUD. 437, 463 (2016) (concluding, based on study of Israeli data, that government officials are motivated by a variety of budgetary and nonbudgetary concerns); Daryl J. Levinson, *Making Governments Pay: Markets, Politics, and the Allocation of Constitutional Costs*, 67 U. CHI. L. REV. 345, 347 (2000) (noting that government officials respond to political, not market, incentives); Susan Rose-Ackerman, *Against Ad Hocery: A Comment on Michelman*, 88 COLUM. L. REV. 1697, 1706 (1988) (observing that the efficiency consequences of a compensation requirement depend on one's view of the way policy is made); see also Christopher Serkin, *Big Differences for Small Governments: Local Governments and the Takings Clause*, 81 N.Y.U. L. REV. 1624, 1627–28 (2006) (contending that the power of the cost-internalization justification may be stronger at the local level than at the state and national levels).

237. See Levinson, *supra* note 236, at 376 (noting that a compensation requirement is not necessary when political forces would induce government to take account of interest groups).

238. *St. Bernard Par. Gov't v. United States*, 887 F.3d 1354 (Fed. Cir. 2018).

239. Christopher Serkin, *Passive Takings: The State's Affirmative Duty To Protect Property*, 113 MICH. L. REV. 345, 362 (2014).

disaster-related losses to landowners. When a government flood control project leads to flooding of land that would not have flooded in the absence of the government intervention, the affected landowner may prevail on a federal takings claim. The landowner, however, faces a significant burden. The landowner must establish not only that the project contributed to the flooding, but also that the land would not have flooded had it been left in its natural state.

St. Bernard Parish Government illustrates this principle.²⁴⁰ The Federal Circuit overturned the Court of Claims' finding of a taking, holding that the owners could not prevail because they had "failed to present evidence comparing the flood damage that actually occurred to the flood damage that would have occurred if there had been no government action at all."²⁴¹ In addition to constructing the MRGO, the federal government had built a vast system of levees to guard against flooding, and the owners had failed to prove that the land would not have flooded if the government had done nothing—that is, if the government had constructed neither the MRGO nor the levees.²⁴² The same approach would presumably apply in the case of a controlled burn to starve a wildfire. That is, the landowner victimized by the controlled burn would have to establish that absent the burn, the wildfire itself would not have reached his or her property.

Existing doctrine, however, would appear to accord different treatment to regulatory measures such as mandatory closings and eviction moratoria.²⁴³ Until recently, the Supreme Court has almost invariably treated regulatory measures under the highly deferential *Penn Central Transportation Co. v. City of New York* balancing test, sustaining those measures against taking challenges.²⁴⁴ Although the Court has developed a categorical rule that a regulation that prohibits all economic use of land constitutes a taking, the Court has held that a temporary prohibition, even if it extends for multiple years, does not fall within the scope of that categorical rule.²⁴⁵ Similarly, the Court has held that a rent control regulation does not constitute a compelled physical invasion of property,

240. 887 F.3d at 1362.

241. *Id.* at 1363.

242. *Id.*

243. In *Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency*, the Court noted that the "longstanding distinction" between acquisitions of property for public use and regulations prohibiting private uses "makes it inappropriate to treat cases involving physical takings as controlling precedents for the evaluation of a claim that there has been a 'regulatory taking.'" 535 U.S. 302, 323 (2002).

244. The so-called *Penn Central* test emerged from *Penn. Cent. Transp. Co. v. City of New York*, 438 U.S. 104, 123–28 (1978). Claimants generally try to avoid the *Penn Central* test by trying to fit the regulation into the Court's categorical rule that a regulation that denies all economically beneficial use of land constitutes a *per se* taking. *Lucas v. S.C. Coastal Council*, 505 U.S. 1003, 1015 (1992). But the Court has rejected those attempts in holding that a temporary moratorium on development does not constitute a categorical taking, *Tahoe-Sierra Pres. Council, Inc.*, 535 U.S. at 341–43, and that a prohibition on development of one of two adjacent parcels constitutes a categorical taking, *Murr v. Wisconsin*, 137 S. Ct. 1933 (2017).

245. *Tahoe-Sierra Pres. Council, Inc.*, 535 U.S. at 341–43.

and therefore falls outside the categorical rule requiring compensation for permanent physical occupations.²⁴⁶

Additionally, *Cedar Point Nursery v. Hassid*,²⁴⁷ decided in 2021, may signal a change in the Court's treatment of regulation. There, the Court treated a California regulation granting labor organizations a right of access to an employer's property as a per se physical taking.²⁴⁸ In doing so, the Court suggested that the "regulatory takings" label is misleading, reasoning that "[g]overnment action that physically appropriates property is no less a physical taking because it arises from a regulation."²⁴⁹ The Court also indicated that a taking qualifies as a physical taking even if it is temporary, so long as it does not qualify as a "mere occasional trespass."²⁵⁰

On one hand, rent control ordinances and eviction prohibitions, like the regulation at issue in *Cedar Point*, require the landowner to suffer occupants the landlord does not want. Further, an eviction moratorium, unlike a rent control ordinance, requires a landlord to endure a tenant's occupancy even if the landlord receives no rent from the tenant, which is a material change in the terms of tenant's occupancy. On the other hand, as the Court observed in *Yee v. Escondido*, rejecting the contention that the challenged rent control ordinance constituted a physical taking, landlords who rent premises "voluntarily open their property to occupation by others."²⁵¹ Moreover, to the extent an eviction moratorium rested on the fear that moving tenants out of apartments would increase transmission of disease, a short-term moratorium might well be supported by the general principle that nuisance regulations do not constitute compensable takings.²⁵²

The status of an eviction moratorium is then somewhat uncertain under emerging Supreme Court doctrine. The other major pandemic-related measure—mandatory closings—probably would not give rise to a takings claim, either, because closings involve no physical invasion of landowner space and are enacted to abate a public health emergency.

2. Administrative Relief

The landowners who advance takings claims are those with the resources and time to endure lengthy litigation. Takings doctrine provides an on-off switch: either the landowner is entitled to "just compensation"—measured by

246. *Yee v. Escondido*, 503 U.S. 519, 527–28 (1992) (holding inapplicable the rule requiring compensation whenever a landowner is required to submit to physical occupation of land).

247. *Cedar Point Nursery v. Hassid*, 141 S. Ct. 2063 (2021).

248. *Id.* at 2074.

249. *Id.* at 2072.

250. *Id.* at 2078 ("[A] mere occasional trespass would not constitute a taking." (internal quotation marks and citation omitted)); see also *id.* at 2074 ("[A] physical appropriation is a taking whether it is permanent or temporary . . .").

251. 503 U.S. at 531.

252. Even in *Cedar Point*, the Court reiterated the principle that "government owes no compensation for requiring [a landowner] to abate a nuisance on his property." 141 S. Ct. at 2079.

fair market value of the property the owner has lost²⁵³—or the landowner receives nothing. By contrast, an administrative compensation scheme has greater flexibility to take into account the reasons for providing compensation, which may not always be to make the landowner whole. On the other hand, large-scale administrative relief raises transparency issues, and political pressures may lead to compensation when neither efficiency nor fairness warrants relief.²⁵⁴

Some basic principles should undergird any administrative provision of post-event disaster relief. First, when insurance is available to guard against the loss in question, a strong presumption against post-event compensation should apply. Compensation threatens to undermine the incentive to purchase insurance and shift disaster risk from landowners to taxpayers, creating an incentive for overinvestment in land.²⁵⁵ The primary efficiency reason for government liability is to avoid the underinvestment in land that might otherwise result from the fear that government action could sharply reduce investment value. The concern is principally with future investors, because the investment of current owners is largely a sunk cost. But when the loss is insurable, as is the case with most natural disasters, investors understand that insurance will cover the loss even if government action contributed in some way. For the owner concerned about the risk of loss, the availability of insurance obviates the need for a compensation requirement. Similarly, so long as insurance is available to cover landowners' losses, compensation is not necessary to protect individual owners from the unfairness of bearing excessive risk. And the potential for government action in the case of a disaster is unlikely to have a substantial impact, positive or negative, on insurance rates.

The presumption against compensation for insurable losses might be overcome in those disaster-prone areas inhabited largely by poorer residents unable to afford either insurance or comparable housing in safer areas. But to the extent compensation is designed as a relief of poverty, that amount should be capped and conditioned on conveyance of the subject property to the state or municipality in order to avoid repeated future claims.²⁵⁶

When losses are not insurable *ex ante*, the fear that the availability of post-event compensation will affect the decision to insure is not applicable. From an efficiency standpoint, the primary question is whether the decision to compensate or not to compensate will lead to inefficient levels of investment in land. But, again, most of the compensation issues involve sunk costs. The landlord subject to an eviction moratorium or the owner of retail property subject to a shutdown order has already made an investment in the land and is unlikely

253. *See, e.g.,* *Horne v. Dep't of Agric.*, 576 U.S. 351, 370 (2015) (concluding that fair market value of raisins constituted just compensation).

254. *See* Bruggeman et al., *supra* note 136, at 206 (noting that political pressures for *ex post* compensation may result in oversupply).

255. *See* Levmore & Logue, *supra* note 10, at 281.

256. *Cf.* Hyatt & Moore, *supra* note 228, at 10344.

to abandon it because of the compensation policy the government adopts. Further, the availability of government compensation in cases of future uninsurable risk appears unlikely to have a significant impact on future investors because the risk itself is so remote.

From a corrective justice standpoint, the strongest case for compensation arises when government action contributes to losses against which an owner cannot have obtained insurance.²⁵⁷ Even then, corrective justice principles do not invariably call for compensation. Consider, for instance, an order requiring an owner to shut down its business or limit the number of patrons it serves. Even in the absence of such an order, the owner may have a duty to protect patrons from known risks associated with the property, even if the risks were not of the owner's making.²⁵⁸ A pandemic-induced shutdown order designed to safeguard patrons and those with whom they interact reinforces the duty the establishment might nonetheless have otherwise. Of course, assumption of risk principles might ultimately bar suit by most patrons,²⁵⁹ but the point remains that requiring an owner to bear the losses from a shutdown order finds parallels in common law corrective justice principles.

Eviction moratoria provide a more compelling case for compensation to landlords. Losses like those inflicted by a long-term eviction moratorium look most like a pure transfer from landlords to tenants.²⁶⁰ In the short-term, health and safety concerns during a pandemic provide adequate justification for a moratorium that reduces levels of movement and exposure. But once it becomes clear that a moratorium is designed exclusively to alleviate tenant economic hardship, it becomes unclear why landlords, and not the public as a whole, should bear the burden of tenants unable to pay monthly rent. Even rent control ordinances, ostensibly enacted because of a housing shortage, typically permit landlords to earn a return on investment and evict tenants who do not pay the lawful rent.²⁶¹ Indeed, the federal government has attempted to provide relief to

257. See Blume & Rubinfeld, *supra* note 13, at 582 (“[T]he private market is not able to provide insurance in the event of physical invasion of land or a regulatory change . . .”).

258. RESTATEMENT (SECOND) OF TORTS § 343 (AM. L. INST. 2022) (“A possessor of land is subject to liability for physical harm caused to his invitees by a condition on the land if, but only if, he (a) knows . . . the condition, and should realize that it involves an unreasonable risk of harm to such invitees, and (b) should expect that they . . . will fail to protect themselves against it . . . ; and (c) fails to exercise reasonable care to protect them against the danger.”).

259. See *id.* § 496(c).

260. Indeed, a transfer made for the sole purpose of transferring property from one party to another violates the Takings Clause even if the government pays compensation. See *Kelo v. City of New London*, 546 U.S. 469, 477 (2005) (“[I]t has long been accepted that the sovereign may not take the property of *A* for the sole purpose of transferring it to another private party *B*, even though *A* is paid just compensation.”).

261. See, e.g., N.Y. COMP. CODES R. & REGS. tit. 9, § 2522.4(c) (2023) (providing that authorized hardship increases when rent would not otherwise exceed expenses by at least 5%); see also *id.* § 2524.2(a) (limiting eviction of rent stabilized tenants “[e]xcept where the ground for removal or eviction . . . is nonpayment of rent”).

landlords during the pandemic, albeit indirectly through applications by tenants who have been unable to pay rent.²⁶²

CONCLUSION

Landowners can obtain protection against the impact of unexpected disasters from two primary sources: insurance and government. Whenever it is available, actuarially sound insurance is the preferable alternative. Unlike government assistance, insurance induces landowners to make investment decisions that take appropriate account of potential disasters, and socially optimal decisions about land use. By contrast, government-subsidized insurance and government compensation for losses provide benefits at taxpayers' expense for owners, many of whom are not impoverished, while providing incentives for inefficient investments in disaster-prone areas. Thus, government intervention should be limited to the demand side: incentives or mandates to overcome biases that cause owners to ignore the possibility of disasters and therefore forego insuring against them.

Not all disasters, however, are created equal. Although advances in modeling technology and judicious use of modern financial instruments expand the availability of insurance against disasters, some risks may remain uninsurable. Even then, however, the case for government compensation or subsidies to affected landowners is a weak one, unless either the compensation is designed to relieve truly impoverished owners, or government action has exacerbated the disaster losses landowners would otherwise suffer.

262. See 15 U.S.C. § 9058a(c)(2)(C)(i)(1).