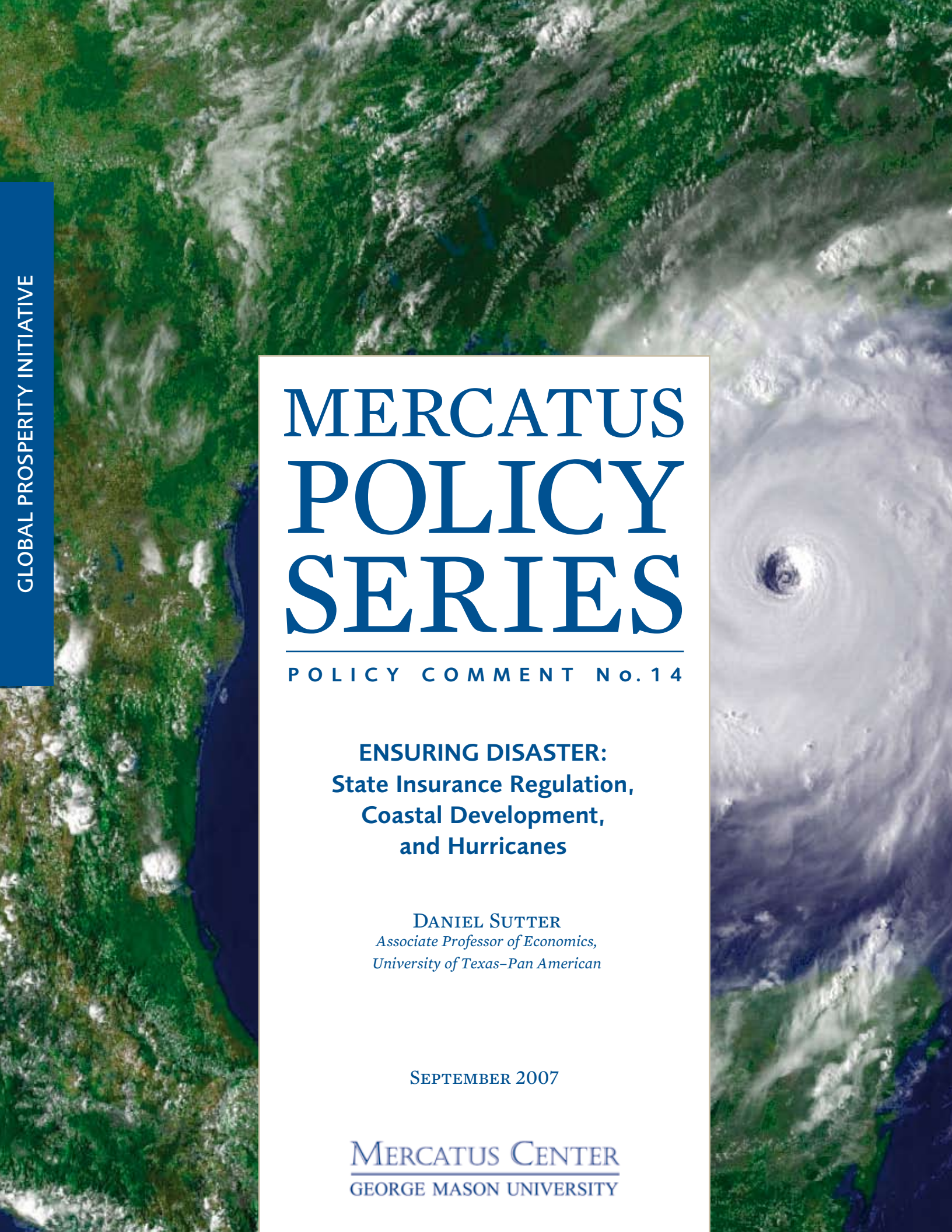

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ENSURING DISASTER: State Insurance Regulation, Coastal Development, and Hurricanes

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MERCATUS CENTER
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ENSURING DISASTER:
State Insurance Regulation, Coastal Development, and Hurricanes

DANIEL SUTTER

EXECUTIVE SUMMARY

Natural disasters are called "Acts of God," but the severity of their impact depends upon many factors, including state insurance regulations. Insurance provides voluntary, contractual disaster relief—insurers agree to pay disaster losses in exchange for payment of premiums. In the United States, state commissions regulate entry, exit, premiums, and contractual forms in the insurance industry.

This policy comment examines how state insurance regulation affects societal vulnerability to hurricanes. States provide insurance for high-risk properties at below market rates primarily through insurance pools. Seven states, including Louisiana and Mississippi, have wind pools, with over 1.8 million policies and a total liability of over $500 billion as of early 2007. Wind pools are financed, in part, through additional charges on other citizens' premiums throughout the state to cover excess losses from hurricanes. State guaranty funds, which ensure payment of claims of insolvent insurers, also subsidize high-risk properties.

Pools and guaranty funds create an inefficient insurance market and inefficient growth in coastal regions. Four state policy responses are recommended:

1. Halt the creation or expansion of wind pools, and phase out existing subsidies and pools.
2. As premiums rise to market levels, give tax credits or means-tested insurance vouchers to low-income residents.
3. If such reforms are not possible, cover potential excess losses using reinsurance or catastrophe bonds.
4. Offer actuarially justified discounts for mitigation measures.

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INTRODUCTION

The extent of the devastation and loss of life caused by Hurricane Katrina seemed impossible in the modern United States. The numbers were truly staggering: over 1,800 fatalities (1,577 in Louisiana and 238 in Mississippi), $40 billion in insured losses, $15 billion in losses under the National Flood Insurance Program, and 90,000 square miles affected by hurricane damage. The death toll was particularly striking. Since Hurricane Agnes in 1972, no hurricane had killed more than 100 people, and the last U.S. hurricane to produce a higher death toll than Katrina was in 1928.

While natural disasters are called "Acts of God," their impact on society depends on the actions taken before, during, and after the event. Politics, businesses, and social groups all affect vulnerability to and recovery from hurricanes. One particular institution that affects vulnerability and recovery is the insurance industry. Insurance spreads the risk of loss across society and provides businesses and households with the resources needed to recover and rebuild after disaster strikes.

Insurance represents a voluntary, contractual means of disaster relief: the investors in an insurance company agree to pay for disaster losses in exchange for payment of regular premiums. Insurance is generally required for investments in physical property because households and businesses are built on credit and the structure serves as collateral for loans. Although the basis for the insurance industry is voluntary and contractual private agreements, the industry is highly regulated in the United States.[1]

This Policy Comment examines how state regulation of the insurance industry affects the vulnerability of society to hurricanes. States regulate the supply of wind, hail, fire, and other components of property and casualty insurance. (Coverage for floods is provided for homeowners under the National Flood Insurance Program.)

The primary regulatory mechanism that states use to provide insurance for high-risk properties at below-market rates is insurance pools. Seven states, including Louisiana and Mississippi, have created special wind or beach pools to cover wind damage from hurricanes and other coastal storms. As of early 2007, over 1.8 million policies with a total liability of more than $500 billion were in effect in wind pools in the United States. Wind pools offer subsidized coverage to high-risk properties and rely on assessments imposed on all insurance contracts written in the state as the main means of covering the losses incurred during a major hurricane. While states promote these subsidies as a means of ensuring affordable coverage necessary for the economic development of coastal areas, in actuality they lead to inefficient growth in coastal regions by encouraging development that does not produce enough value to cover the damage hurricanes can cause to that development.

Another state intervention in the insurance industry is a guaranty fund, which ensures payment of claims of insolvent insurance companies (similar to deposit insurance for banks). Guaranty funds subsidize high-risk properties since catastrophes are a likely cause of insurance company failure.

1. The U.S. insurance industry largely avoided the deregulation that has occurred in the transportation and financial services since the 1970s.

Insurance pools and state guaranty funds complicate hurricane damage mitigation, encourage inefficient growth in coastal regions, and lead to the cross-subsidization of insurance wherein poorer property owners subsidize more wealthy property owners. Insurance pools and guaranty funds not only create an inefficient insurance system, but more importantly, they create an environment in which more people put themselves directly in the path of hurricanes. To prevent, or at least reduce, these problems, policy must change. The most beneficial policy change states could make would be eliminating wind pools, but states could make substantial improvements even by simply reforming the current system. Four policy responses would allay the problems that insurance regulation causes.

1. Introduce a moratorium on the creation of new hurricane pools or on the expansion of existing ones, restrict coverage at current subsidized rates for new construction in existing pools, and phase out the existing subsidies and pools over a given period, perhaps ten years.

2. As premiums rise to market levels, give tax credits or means-tested insurance vouchers to current low-income residents. However, do not provide such credits or vouchers to low-income residents who are new to the area.

3. If a moratorium on creation or expansion of pools is not possible, better align the incentives between policy makers and taxpayers by implementing mechanisms that increase the current costs of state action. For instance, instead of relying primarily on assessments to cover potential excess losses, require states to purchase reinsurance or issue catastrophe bonds to cover a fixed proportion of potential excess losses.

4. Finally, offer actuarially justified discounts for damage mitigation measures.

This policy comment begins with a general overview of the societal risk of hurricanes. Next, it discusses the complications with standard insurance as well as the more extreme case of disaster and hurricane insurance. It then delves into the mechanisms—specifically wind pools—by which U.S. states provide subsidized insurance for risky properties. The following sections explain how wind pools and other state-sponsored insurance mechanisms lead to many negative consequences. Finally, the last section provides policy recommendations to rectify some of the problems caused by the coastal states' provision of hurricane insurance.

I An Overview of Natural Disaster Insurance

A. Is Societal Vulnerability to Hurricanes Bad?

In the aftermath of Katrina, many observers have noted that building a city like New Orleans below sea level in an area exposed to hurricanes was folly. Others fear that rapid population growth in coastal counties is setting the stage for a repeat of the Galveston hurricane of 1900 on an even larger scale. To these observers, more people and property on hurricane-exposed coasts means greater vulnerability to and, consequently, greater damages arising from the next hurricane. They argue that the way to limit societal vulnerability to hurricanes is to limit coastal development.

Such claims miss the mark because they ignore the benefits of living or working along the coast. Consider house fires, which kill about 3,000 Americans each year. We could prevent house fire deaths by tearing down our homes and living under the stars. Or consider auto accidents, which claim 40,000 American lives annually. Banning cars would prevent auto fatalities. Proposals like these are ridiculous because they consider only the costs of accidents and ignore the benefits of homes and driving. Obviously, we try to prevent house fires and auto accidents, but their costs are small compared to the value of living in homes and driving cars. In the same way, many people greatly value living or vacationing by the sea. As long as this value exceeds the added cost of periodic hurricane damage, larger coastal populations make society better off. However, vulnerability becomes a problem if coastal residents and businesses can shift the cost of hurricanes to others.

Insurance is one of several ways, along with post-disaster assistance and tax deductions for disaster losses, that coastal residents shift a portion of hurricane costs to their fellow citizens. But only a regulated insurance market can truly shift costs, because insurance itself, despite appearances, does not truly shift costs onto a third party. A policyholder whose house is destroyed may well receive a payment greater than all the premiums paid to date, but

this does not unfairly impose costs on others because the insurer accepts the risk in exchange for payment of premiums. An insurer who makes the contract voluntarily must consider the premiums to be worth the possibility of having to pay the claim, and thus the homeowner has paid in full for insurance coverage if a claim is paid. However, in a regulated insurance market, coastal residents typically pay less than the market price for wind coverage, and this shifts some of the costs to other people who may not live anywhere near the coast.

Shifting the cost of coastal living creates inefficiency and unfairness. Cost shifting is inefficient because it induces some people who do not value oceanside living more than the extra costs of living in an area at risk of being hit by hurricanes to move to those higher-risk areas. Cost shifting is also unfair because residents do not share the benefits of beachfront living with other members of the wind pool—they do not allow non-residents to use their homes or condos for a couple of weekends each summer. If coastal residents do not share their homes with strangers, why should the strangers share the cost of hurricane repairs?

B. The Challenges of Natural Disaster Insurance

Insurance is a way to share losses. Business ventures such as constructing offshore oil drilling platforms entail risk. The well may produce little oil, experience breakdowns, and generate excessive costs. The price of oil might plummet, rendering the investment unprofitable. A hurricane could destroy the platform, a fate that befell more than 100 offshore oil platforms during hurricanes Katrina and Rita in 2005. Financing a business venture is often complicated, and the potential for the destruction of an oil platform, skyscraper, or factory in a fire or natural disaster is one of these complications. Insurance is a mechanism for reimbursing investors for destruction of the platform or factory. Arranging compensation in the event of a fire or hurricane can be crucial to getting the venture underway.

Several factors complicate insurance contracts. One problem is moral hazard, which occurs when knowledge that loss or damage will be compensated reduces the incentive for people to prevent the damage or loss. Another problem, adverse selection, arises if a person knows better than the insurer that he is likely to have a loss; the risk is known to him but hidden from the insurer. An insurer can respond to a known high risk by charging a higher premium, but the potential for a hidden high risk can potentially disrupt private insurance markets. Third-party payment after losses is another problem, as it lowers the out-of-pocket cost to the policyholder and leads to overspending, particularly if the contract cannot precisely specify what must be paid. Moral hazard, adverse selection, and third-party payment all increase the cost of insurance, and insurance companies take many steps to control these costs and keep insurance reasonably priced.

From society's point of view, living and working in a hurricane-exposed coastal area is a risky venture, just like building an offshore oil platform. Living, working, and vacationing in places like Miami, the Florida Keys, South Padre Island, and the Outer Banks provides great value to society and is worthwhile if the benefits exceed the damage wrought when a hurricane eventually strikes. Sharing the costs of a hurricane through the use of insurance can be necessary for a venture to be feasible.

Correlation of Losses

A particular problem for hurricane and catastrophe insurance is the correlation of losses. For typical insured losses, the chance that any two policyholders suffer a loss in a given year is independent: my auto accident this year does not increase or decrease the likelihood that you will have an accident this year. When risks are independent, an insurance company can pool risks by issuing a large number of policies. For instance, if 5 percent of drivers have an accident each year, a company with 100,000 auto insurance policies can expect 5,000 claims in the year. More importantly, the company is highly unlikely to have more than 6,000 claims in a year. Thus, each year's premiums can usually cover each year's losses, and the risk of excessive losses, which might force the insurer into insolvency, is low.

However, in the case of Hurricane Katrina, most policyholders in southern Mississippi had claims. Instead of only 5 percent of policyholders having a claim, in the case of hurricane coverage there might be a chance that all policyholders will have claims. Consequently, insurers face a greater risk of insolvency for catastrophes. Insurers then must either accumulate substantially larger reserves or purchase reinsurance (an insurance policy purchased by insurance companies to cover large losses) in order to pay claims in case of disaster. Either way, this raises the market premium for insurance against hurricanes and other natural disasters like earthquakes. In addition, insurers must pay taxes on the reserves they accumulate for catastrophe insurance, and as a study

The Problem of Probabilistic Hurricane Coverage

After Katrina, the exclusion of flood coverage from homeowners' insurance policies caused considerable confusion, anger, and litigation. Researchers have argued that probabilistic insurance—an insurance policy involving a small probability that the consumer will not be reimbursed—is similar to excluding flood losses from hurricane zone property insurance policies.[1] Experimental evidence suggests that consumers do not value this type of insurance.[2] In an experiment, subjects were told that, given the high premium, purchasing insurance and not insuring were equally good deals. For half the original premium, subjects could buy a policy that would offer a 50 percent chance of coverage if a loss occurred. Overwhelmingly, subjects chose against this probabilistic insurance.

This is similar to the situation in which many Gulf Coast residents have found themselves after Katrina. Water damage in New Orleans often resulted from both flood waters and rain water following wind damage to a home. For the homeowner with no flood insurance, inspection might determine that rainwater produced the loss, in which case the loss is covered. Or, inspection could determine that flood waters produced the damage, in which case the loss is not covered. On the Mississippi Coast where many buildings were completely destroyed, assessors faced the nearly impossible task of determining if wind or storm surge produced the damage.

State hurricane or beach insurance pool policies clearly are not meant to cover flood damage. Nonetheless, the structure of hurricane pools almost seems designed to generate confusion. It would only be natural for a homeowner with insurance through the pool to assume all hurricane losses are covered. The average resident may not realize that because a hurricane produces damage from wind, storm surges, tornadoes, and fresh water flooding, the pool's wind coverage is only partial insurance. The perception of greater coverage through the hurricane pool increases the apparent subsidy coastal residents receive. Residents will compare the homeowners' insurance premium with the coverage *they believe* they receive and infer that insurance is a better bargain than is actually the case. The effect is similar to citizens comparing their individual tax bills with the government services they receive and thereby determining that government is a low cost supplier of these services.[3] A belief that hurricane pools offer full insurance, or insurance at a lower rate than they actually do, contributes to inefficient development in high risk areas.

1. Howard Kunreuther and Mark Pauly, "Rules Rather than Discretion: The Lessons from Hurricane Katrina," *Journal of Risk and Uncertainty*, 33, no. 1–2 (2006), 101–16.
2. Daniel Kahnemann and Amos Tversky, "Prospect Theory: An Analysis of Decision Under Risk," *Econometrica* 46 (1979), 269–71.
3. James M. Buchanan and Richard E. Wagner, *Democracy in Deficit* (San Diego, CA: Academic Press, 1977).

showed in 2000, taxes can substantially increase costs for a provider of catastrophe insurance.[2]

Ambiguity

An additional factor increasing the cost of catastrophe insurance is the ambiguity or uncertainty of the risk. Ambiguity prevents hurricane insurance from using pricing processes similar to life or car insurance, for which actuaries have millions of prior events to estimate probabilities of loss with precision. In comparison, hurricane risks are uncertain. We have few prior hurricanes on the recent historical record, and changing conditions limit the inferences for future losses that can be drawn from past events.

A 1995 study analyzed how ambiguity affects the insurance underwriting process. The researchers asked a national survey of underwriters, the people who make pricing decisions for insurance companies, to estimate the pure premium (which would not include allowances for commissions or claims expenses) they would charge for a variety of different losses under different scenarios of ambiguity.[3] The underwriters consistently charged higher premiums for ambiguous risks, 20 to 60 percent higher when either the probability or the amount of the loss was uncertain and about twice the premium when both the probability and amount of the loss were ambiguous.[4]

However, the problem is more severe than the experiment attempts to explain. The ambiguity examined by the research team was actually risk, not genuine uncertainty. In the survey, the underwriters were told the range of losses or probabilities of loss. But in many real-life cases, insurance companies do not know the full range of possible losses or possible probabilities. For example, prior to Hurricane Andrew, experts estimated that the maximum insured loss from a south Florida hurricane would be $10 billion; Andrew easily exceeded the amount. After Andrew, estimates of the worst-case loss for South Florida increased to $50 billion. In recent years, meteorologists and climatologists have considered a possible link between global climate change and an

2. The taxes accrue on the accumulated earnings plus interest; state funds are allowed to accumulate reserves tax free. Scott E. Harrington, "Rethinking Disaster Policy," *Regulation* 23, no. 1 (2000): 40–46.
3. The scenarios included no ambiguity, ambiguity regarding the probability of loss, ambiguity about the amount of the potential loss, and ambiguity about the probability and amount of loss and were variously described as earthquake risk, a risk to an underground tank, or as a neutral case.
4. Howard Kunreuther, Jacqueline Meszaros, Robin M. Hogarth, and Mark Spranca, "Ambiguity and Underwriter Decision Processes," *Journal of Economic Behavior and Organization* 26 (1995): 337–52. The underwriters also charged higher premiums for the underground tank, suggesting that they were inferring uncertainty from their own experience with such insurance.

increase in the number, size, and strength of hurricanes.[5] Debate continues regarding whether human actions are changing global climate and whether the recent increase in hurricane activity is related to this or if it is part of a regular cycle in the Atlantic Basin, but the current disagreement among scientists contributes to the uncertainty that insurance companies face.

Insurers face ambiguity not only from the severe weather itself, but also in the political and legal spheres. Prior to Hurricane Andrew, South Florida had one of the nation's strictest building codes on the books, and insurance companies took this into account in estimating potential hurricane costs and setting premiums. Studies after Andrew, however, found that local governments had failed to enforce the code, and that 25 percent of the losses were attributable to a failure to build to code.[6] Katrina sparked a wave of litigation, including a lawsuit by the State of Mississippi to force insurance companies to pay for flood damage on wind damage policies that explicitly excluded flood losses. Both of these instances demonstrate how regulators, legislators, and the judiciary can increase ambiguity for insurance companies—and thus increase the costs they must charge.

Ambiguity forces insurance companies to raise rates, but this is a real cost to society, not a market failure. Ambiguity exists because experts in climatology, engineering, and risk assessment cannot agree on the frequency of hurricanes or the possible losses. State legislators and insurance commissions cannot magically make ambiguity disappear. Insurers assume losses that might occur, but with ambiguity we simply do not know the losses or even the distribution of the losses that might result from living in the Florida Keys, the Outer Banks, or New Orleans.

If any of us were to put our own personal wealth at risk to pay losses, we would naturally be quite cautious about taking on an uncertain risk. Executives of insurance companies wisely want to avoid writing policies for poorly specified risks at rates that might turn out to be much too low. Politicians can commit government to assume such a risk in part because politicians are not personally responsible if future losses turn out to be excessive. Politicians benefit by delivering lower rates for high-risk policyholders—the policyholders pay less for insurance and real estate prices can continue to rise—but they have not eliminated the ambiguity. However, politicians are somewhat shielded from the effects of their policies, as a major hurricane that produces massive losses may not occur for years, perhaps after the politicians have retired from office.

Higher insurance premiums due to ambiguity will slow development in coastal areas, which is the proper response. Consider the possibility that global climate change will increase hurricanes in the future. Suppose that an increase in the frequency, size, and intensity of hurricanes could double expected hurricane damage over the life of a building, holding constant the quality of construction. Living or working by the ocean *might* become considerably more dangerous, so insurers will require extra compensation to assume this potentially escalating risk. Coastal development is an irreversible, long-lived investment, and reducing investment now is the prudent and economically efficient response to uncertainty about future losses.[7] Increased premiums due to ambiguity help to slow investment. On the other hand, suppressing the rate increases via regulation or insurance pools increases the amount of at-risk property at a time when future losses are uncertain and caution should be the order of the day.

Ambiguity spurs policy interventions because it contributes to the insurance crises that often follow major hurricanes. When a major hurricane leads insurers to revise their estimates of potential losses upward, insurers will want to raise rates. But price regulation by state insurance commissions limits companies from raising premiums as much as desired. A binding price ceiling leads to a shortage, which in the insurance market leads companies to cancel coverage and neither renew policies nor write new ones in high-risk areas. The crisis of availability of

5. Kerry Emanuel, "Increasing Destructiveness of Tropical Cyclones over the Past 30 Years," *Nature*, 436 (2005): 686–88; Roger A. Pielke, Christopher Landsea, Max Mayfield, J. Laver, and R. Pasch, "Hurricanes and Global Warming," *Bulletin of the American Meteorological Society* 86, no. 11 (2005): 1571–75.

6. Dennis J. Mileti, *Disasters by Design* (Washington, DC: Joseph Henry Press, 1999); Paul Fronstin and Alphonse G. Holtmann, "The Determinants of Residential Property Damage Caused by Hurricane Andrew," *Southern Economic Journal* 61, no. 2 (1994): 387–97.

7. Kenneth J. Arrow and Robert C. Lind, "Uncertainty and the Evaluation of Public Investment Decisions," *American Economic Review* 60, no. 3 (1970): 364–78.

Insurance and Mitigation

Mitigation involves reducing the threat of natural disasters to life, limb, and property. The most extreme hurricane mitigation measure is not developing high-risk areas. For example, a hurricane would cause little damage in the Florida Keys if they were uninhabited. Other mitigation measures include hurricane shutters or blinds, wind-resistant garage and entry doors, shatter-resistant glass windows, and improved roofing materials and construction.[1]

Insurance generally encourages safe building and manufacturing practices since insurers must pay claims when accidents occur. For example, an airline's insurance carrier has an incentive to ensure the airline hires only skilled pilots and qualified mechanics and performs regular maintenance. However, some experts contend insurers have done too little to encourage hurricane mitigation:

> The challenge which society faces today is how to promote investments in cost effective loss reduction mechanisms, while at the same time placing the burden of recovery on those who suffer losses from natural disasters. In theory, insurance is one of the most effective policy tools for achieving both objectives.... In practice, insurers generally do not charge premiums which encourage loss prevention measures. They feel that few people would voluntarily adopt these measures based on the small annual premium reduction, as compared with the upfront cost of investing in these measures.[2]

State provision of below-market premiums in high-risk areas—where mitigation is most valuable—deters insurers from offering premium discounts for mitigation. Even if the expected reduction in losses due to mitigation justified a discount, an insurer would probably increase market share by offering lower premiums, which is undesirable when the company is losing money on each policy it writes. Subsidized base premiums reduce insurers' incentive to provide any insurance or to encourage mitigation.[3] Regulatory policy can also discourage insurer interest in mitigation. Companies must receive regulatory approval for mitigation-related premium reductions and prepare a case in support of the reduction for each state commission.[4]

State insurance pools do take the quality of construction into account, as states allow premium reductions for strengthened construction. For instance, South Carolina offers a 10 percent discount on homes built according to the Institute for Business and Home Safety's Fortified Homes Program. The Mississippi Windstorm Underwriting Association offers substantial reductions for windstorm resistant structures. All state programs have inspection provisions and requirements that property meet general underwriting standards. Property that fails inspection may be ineligible for coverage. However, provisions also exist to exempt some properties from inspection. In Texas, for example, inspection is not required if the property was previously insured in the voluntary market and the insurer is not renewing the policy. Moreover, properties built before the local adoption of building codes may avoid inspection.

Key to any inspection program is the rigor of the inspections. However, excessively strict requirements undermine the insurance pool's benefit to politicians, who gain favor by providing certain people with subsidized insurance. If rigorous inspection requirements deny too many coastal residents coverage, the political benefits evaporate.

1. For more on measures to reduce hurricane damage to homes or businesses, see the Institute for Business and Home Safety Web page, http://www.ibhs.org.
2. Howard Kunreuther, "Mitigating Disaster Losses through Insurance," *Journal of Risk and Uncertainty*,12 (1996), 180.
3. William Petak, "Mitigation and Insurance," in *Paying the Price*, eds. H. Kunreuther and R. Roth (Washington, DC: Joseph Henry Press, 1998), 155–70.
4. Kunreuther, "Mitigating Disaster Losses," 180.

insurance leads politicians to intervene in the market to ensure the availability of insurance through wind and beach pools, as explained in the next section.

2 State Involvement in Hurricane Insurance

States regulate insurance in a manner analogous to public utility regulation. States, with assistance from the National Association of Insurance Commissioners, license insurance companies and commissions and regulate rates, forms of contracts, and conduct to prevent insolvency. An insurance company typically writes many types of insurance and attempts to divide potential customers in each class based on risk. Thus, insurers supply many different products (property-casualty insurance, auto insurance, life insurance) to different markets within a state.

When regulated firms supply multiple products, the potential exists for cross-subsidization. Cross-subsidization involves some customers of a regulated, multi-product firm paying extra so that other customers can receive a product or service for less than cost.[8] This is termed cross-subsidization to distinguish it from a direct government subsidy that allows some customers to receive service below cost. The prices charged by many utilities, airlines, and railroads during regulation involve cross-subsidization, often with high-cost customers receiving a good or service for about the same price as low-cost customers. For instance, rural residents typically receive

8. Richard Posner, "Taxation by Regulation," *Bell Journal of Economics & Management Science* 22 (1971).

phone and electric service for a price similar to that paid by urban residents, even though the cost of servicing rural residents is higher due to a lower population density. Similarly, first-class postage costs the same regardless of the distance the letter travels.

A. State-Run Insurance Pools

The mechanism for cross-subsidization in insurance, the insurance pool, differs somewhat from traditional cross-subsidization. High-risk hurricane states have created state-run pools called wind or beach pools. Insurance pools were inaugurated in the 1960s in response to policy cancellations in large cities following riots. Federal legislation at the time authorized states to create what are called Fair Access to Insurance Requirements (FAIR) plans. Since 1968, seven states have established hurricane pools based on this type of mechanism. Insurance pools write policies for high-risk properties at below-market rates and accumulate the premiums. When losses exceeding the accumulated premiums occur, the pool can impose assessments on all policies in the state written on designated lines of business. As all licensed insurance companies in the state are "members" of the insurance pool as a condition of their license, the state typically applies assessments as a percentage of the company's premiums written in the state on assessable lines. For example, a company with a 5 percent market share will pay 5 percent of assessments.

Thus, with a state-instituted pool, an insurance company cannot avoid exposure to high-risk areas of the state by not renewing or not writing policies in these areas. The only way an insurer can avoid assessments is to exit the state entirely or at least the assessable lines of business, which often amounts to the same thing. Insurers may not wish to exit the state entirely because they have invested in agents and claims adjusters, established a reputation with customers, or have developed expertise in the state insurance market (e.g., state-specific loss patterns). Exiting a state market completely could also damage the reputation of a national insurance company. And exit from a state market, even if costly, may not be possible since state insurance commissions also place restrictions on non-renewal or cancellation of policies in the aftermath of major hurricanes.[9] The assessments imposed by the state pools on insurance companies can, in most cases, be passed on to policyholders—the majority of whom do not live in risky coastal areas. This makes the end result of the assessment the functional equivalent of an excise tax on insurance, albeit applied retroactively.[10]

The assessments imposed by the state pools on insurance companies can, in most cases, be passed on to policyholders—the majority of whom do not live in risky coastal areas.

Seven states have established hurricane pools, variously called wind or beach pools (Table 1). In 1968, Louisiana became the first state to establish a pool based on its FAIR plan. In 1970, after Hurricane Camille, policy makers established a much smaller beach plan and combined the two plans in 2003 to form the Louisiana Citizens Property Insurance Corporation (LCPIC). North Carolina, Florida, South Carolina, Alabama, and Texas all inaugurated similar plans between 1969 and 1971. Mississippi set up the Mississippi Windstorm Underwriting Association in 1987.

The various programs have been revised and expanded over time. Florida, for example, established the Florida Windstorm Underwriting Association (FWUA) in 1970 to provide wind and hail coverage and the Residential Property and Casualty Joint Underwriting Association in 1993, after Hurricane Andrew, to provide homeowners' and fire insurance, plus wind coverage in areas not already served by the FWUA. It combined the two programs in 2002 to form the Florida Citizens Property Insurance Corporation (FCPIC). North Carolina's plan initially offered only wind and hail coverage on the barrier islands, but in 1998 expanded this coverage to 18 counties in the coastal area. In 2003, North Carolina's association began offering full homeowners' insurance.

Other states offer insurance pool coverage to a lesser degree through their FAIR plans. Of the 11 other Atlantic coast states, all but Maine and New Hampshire have

9. Insurance companies make a sunk investment in serving a state market; Fred McChesney discusses how such sunk investments leave businesses vulnerable to opportunistic behavior from politicians in *Money for Nothing: Politicians, Rent Extraction, and Political Extortion* (Cambridge: Harvard University Press, 1997).

10. Louisiana was one of the last states to allow insurers to begin passing on assessments in 2003. Of course passing on the assessment to the policyholder is a symbolic gesture, since the elasticities of demand and supply will determine whether policyholders or the insurance companies truly pay for the assessments.

FAIR programs, and of the nine states with FAIR pools, all but Connecticut and Delaware have explicit hurricane coverage provisions described on their Web pages. Georgia, New Jersey, New York, and Virginia all have extensive hurricane wind coverage provisions in place.[11] For instance, New York's program features a Coastal Market Assistance Program, while New Jersey has a Windstorm Market Assistance Program. About one-third of policies and coverage of the Virginia FAIR plan are in the Hampton Roads area and on the Eastern Shore, which are high-risk areas for hurricanes.

TABLE 1: STATE WIND AND BEACH POOLS

STATE	CURRENT NAME	YEAR ESTABLISHED	POLICIES IN FORCE	TOTAL LIABILITY
Alabama	Alabama Insurance Underwriting Association	1970	7,499	$1.313 Billion
Florida	Citizens Property Insurance Corporation	1970	1,298,922	$408.8 Billion
Louisiana	Louisiana Citizens	1968	129,203	$21.13 Billion
Mississippi	Mississippi Underwriting Association	1987	30,962	$5.370 Billion
North Carolina	NC Insurance Underwriting Association	1969	141,843	$57.27 Billion
South Carolina	SC Wind and Hail Underwriting Association	1970	30,091	$12.17 Billion
Texas	Texas Windstorm Insurance Association	1971	160,281	$50.23 Billion

Table 1 shows the number of policies in force, as well as total coverage for the seven state wind pools as of the end of 2006 or early 2007. Overall, 1.8 million residential and commercial policies are in force, with more than $550 billion in potential liability. The overwhelming majority of the exposure is in Florida, with 1.3 million policies and over $400 billion in liability. But Texas, North Carolina, and Louisiana have more than 125,000 policies in effect, and North Carolina and Texas each have over $50 billion in liability in their insurance pools. Although the exposure is greatest in Florida, the number of policies and liability is increasing rapidly in some other states. For instance, the amount of wind-only coverage in Georgia's FAIR plan, which approximates coastal zone coverage, increased by 73 percent between 2005 and 2006. The number of policies written by the Alabama Beach Pool doubled and the total insured value almost tripled between December 2005 and December 2006.

FCPIC has a very sizable share of the Florida property insurance market. Overall, it is the second-largest insurer in the state with 5 percent of premiums. The pool is also the second-largest provider of homeowners' multi-peril insurance with 9 percent of the market and is first in market share for fire and allied lines.

In an attempt to reduce this exposure, FCPIC and the state have engaged in an effort to place coverage in the voluntary market. At times, the insurance pool has paid bonuses to private insurers who assumed these policies. Following the 2004–05 hurricane season, the Poe Financial Group (composed of Atlantic Preferred, Southern Family, and Florida Preferred), many of whom were given bonuses from the state-run plan, became insolvent. Poe had issued more than a quarter million homeowners' policies and over 40,000 homeowners and condominium association policies. Before the 2006 hurricane season, these policyholders were transferred to the FCPIC pool. Florida levied $225 million in assessments on insurance policyholders in Florida to cover the unpaid claims of the Poe companies. The failure of the Poe companies illustrates the riskiness of the policies typically written by insurance pools and consequently the extra costs insurance companies in the market would face to hold so many high-risk policies.

Do wind pools really offer insurance at subsidized rates? Many wind pools make statements similar to this one from South Carolina:

> Almost anyone in the coastal area can purchase wind and hail coverage from the Association. It should be

11. Georgia, New Jersey, New York, and Virginia's plans have never been legally constituted as separate pools. The New Jersey and New York market assistance programs are different in form from beach plans, because applications come into the Market Assistance Program for insurance and the plan places the coverage with companies that have volunteered to write coverage under the plan. However, because these states have not formed their own separate wind pools, they are not included with the seven legally constituted, separate beach pools, but the seven explicit beach plans do not constitute the entirety of state regulatory efforts to provide below-cost wind coverage.

> pointed out that consumers may find broader coverage at a better price in the regular competitive insurance market. In fact, it is highly recommended that an applicant seek to buy insurance in the standard market before applying to the Plan for coverage.[12]

In Louisiana, LCPIC's rates are "not intended to be competitive with the voluntary market" and must "exceed by at least 10 percent the average rates charged by the insurer that had the highest average rate in that parish among the ten insurers with the greatest total direct written premium in the state for that line of business in the preceding year."[13] Although cheaper coverage is available in the market, this does not mean that the rates are not subsidized. Even within a parish, expected hurricane damage can vary substantially. Hurricane winds typically weaken quickly as a storm moves inland, and thus coastal property can have substantially higher expected damage than properties even a few miles inland. The rates that insurance companies charge for inland properties in coastal counties may be much lower than the rates they would charge for properties nearer the beach. Further, rates in the voluntary market are subject to regulation and could be below market level themselves. Consequently, the fact that the rates of a pool are greater than the "market" rates of private insurers does not demonstrate that pool rates are not subsidized.

Evidence that wind pools charge below-market premiums comes from the assessments levied after major hurricanes. Consider Florida and Louisiana in 2005. Florida was struck by three hurricanes in 2005—Dennis, Katrina, and Wilma—after four powerful hurricanes struck the state in 2004. As a result, the FCPIC pool imposed a $163 million regular assessment for 2005 and an emergency assessment of $888 million for 2005, to be collected via a 1.4 percent charge on assessable premiums annually for ten years. Additionally, the state legislature appropriated $715 million to assist the company. The Florida Insurance Guaranty Association levied a 2 percent assessment in 2006 to raise $225 million to cover unpaid claims resulting from the Poe Financial Group's insolvency. And the Florida Hurricane Catastrophe Fund levied a 1 percent assessment to remedy a deficit that it faced due to payments to insurance companies.

In 2005, LCPIC recouped $129 million in regular assessments, or 10 percent of premiums in the state. In 2006, the state of Louisiana issued $978 million in bonds to allow LCPIC to cover its deficit, with the bonds to be paid for from a 2006 emergency assessment of 3.6 percent of premiums in the state for as many years as necessary to retire the bonds. As a result, Louisianans in Shreveport, Alexandria, Monroe, and other places far removed from the coast will be paying assessments on their homeowners' insurance for at least the next decade.

Because, by definition, catastrophes are not expected to occur often, the subsidies in the rates of wind pools can be hidden for years. The Texas Windstorm Insurance Association (TWIA), for example, has been in existence since 1971 but has only implemented two assessments: $157 million after Hurricane Alicia in 1983 and $100 million after Hurricane Rita in 2005. Over this period, it might appear that TWIA has charged rates that almost cover costs. However, it just takes one catastrophe to destroy this illusion. For example, the 1994 Northridge earthquake resulted in insured losses greater than all of the earthquake insurance premiums ever collected in California. In 2005, the National Flood Insurance Program suffered greater losses in that one year than in all prior years combined.

B. Guaranty Funds

STATE GUARANTY FUNDS, which pay claims on the policies of insolvent insurance companies, provide another important regulatory subsidy for high-hurricane-risk properties. Ensuring solvency is the primary goal of insurance regulation,[14] and much of the activity of state regulators is to prevent insurer insolvency. The correlated risk of losses with hurricanes is a major source of insolvency. In Florida, nine insurance companies failed after Hurricane Andrew, while the Poe Financial Group companies failed after the 2004–05 hurricane seasons. Nationally, catastrophe risks were the main cause of insurer impairments or insolvencies in 2006.

When an insurance company is in financial distress, a condition insurance regulators politely term "impaired,"

12. South Carolina Wind and Hail Underwriting Association (SCWHUA), "About Us: Who Is eligible to Buy through the Beach Plan?" http://www.scwind.com/about.html.
13. Louisiana Citizens Property Insurance Corporation, "Plan of Operation," http://www.lacitizens.com/pdf/LCPICPlanofOperation.pdf, December 2, 2003.
14. Kenneth J. Meier, "The Politics of Insurance Regulation," *Journal of Risk and Insurance* 58, no. 4 (1991): 700–13.

a state commission will typically step in to try to rehabilitate the company or combine it with another insurer. If a company does fail, guaranty funds can impose assessments on insurers in the state to ensure payment of claims on the failed company's policies. Since 1978, state guaranty funds have imposed more than $11 billion in assessments to cover claims of insolvent insurers.[15] When making insurance purchases in the absence of guaranty funds, policyholders would need to take into account the financial soundness of insurance companies through market ratings of insurer soundness provided by companies such as A.M. Best and others. Guaranty funds simply reduce the consumer's incentive to consider financial soundness in their purchase decision or pay extra for coverage from a highly rated company.

High-risk coastal properties benefit disproportionately from guaranty funds because, in their absence, policyholders would need to pay extra for insurance from a company able to survive large losses caused by a major hurricane. A recent study found evidence of this very behavior by policyholders in Florida.[16] The study examined homeowners' choice of insurance carrier in Florida, where the guaranty fund limits coverage on a policy to $300,000. Therefore, owners of homes insured for more than $300,000 face some loss in case of insurer insolvency after a hurricane, while owners of more modest homes have full coverage in case of insolvency. The researchers found that owners of these high-priced homes were significantly more likely to choose an insurance company rated A+ or A++ by A. M. Best.

C. Other Mechanisms

States have taken other steps that shift some of the cost of hurricanes to others. Florida after Hurricane Andrew and Louisiana after Hurricane Katrina issued revenue bonds to provide cash infusions for their state insurance pools, with the bonds to be paid off through future assessments on insurance policies. In Texas, if insurance companies face sufficiently high assessments for TWIA (currently about $1 billion), they can write off the assessments against their state taxes. Florida established a Hurricane Catastrophe Fund, funded by assessments against a very broad base of insurance policies. The fund provides financial assistance to insurance companies in the aftermath of hurricanes, a role equivalent to the reinsurance that is typically purchased by individual companies. But the fund provides reinsurance at below-market rates. Florida also provided a legislative appropriation to FCPIC after the 2005 hurricane season.

3 Rationales and Effects of State Policy

A. Insurance Pools and Affordable Insurance

Maintaining affordable insurance for homeowners and businesses is a stated goal for most wind pools. A description of TWIA, for example, explicitly states affordability as the policy goal, while the Mississippi Windstorm Underwriting Association's plan of operation mentions the availability of adequate insurance for coastal residents. Obviously, "affordability" is a subjective term and must be used with great care. Millionaires could bemoan how rising oil prices are making fuel for their private jets unaffordable, yet this would be a dubious basis for subsidies. Hurricane Katrina brought national attention to the distribution of natural disaster impacts: the poorest residents of New Orleans who lived in areas vulnerable to the worst flooding were the least likely to be insured. In evaluating wind insurance pools, it is important to consider who benefits from below-market subsidized insurance.

A comparison of economic and housing statistics for coastal counties in states along the Atlantic and Gulf coasts provides evidence on this question. Using data from the 2000 census, table 2 reports four measures of income and housing for the coastal counties of each state and the state as a whole: per capita personal income (PCPI), the median price of owner-occupied housing, the percentage of owner-occupied homes valued over $500,000, and the percentage of owner-occupied homes valued over $1 million.

Coastal counties cannot be considered economically destitute areas of the states. In eight of the 18 states, the coastal counties have higher income than the state as

15. Insurance Information Institute, "Issues Update: Insolvencies/Guaranty Funds," May 2007, http://www.iii.org/media/hottopics/insurance/insolvencies/.

16. Martin F. Grace, Robert W. Klein, and Paul R. Kleindorfer, "Homeowners Insurance with Bundled Catastrophe Coverage," *Journal of Risk and Insurance* 71, no. 3 (2004): 351–79.

TABLE 2: COASTAL COUNTIES VS. STATES, INCOME, AND HOUSING

	COASTAL COUNTY VARIABLES				STATE VARIABLES			
	PCPI	MEDIAN HOUSE PRICE	% $500K HOUSES	% $1 MILLION HOUSES	PCPI	MEDIAN HOUSE PRICE	% $500K HOUSES	% 1 MILLION HOUSES
ALABAMA	18,126	91,300	1.37	0.30	18,189	85,100	0.98	0.21
CONNECTICUT	30,536	208,800	10.79	3.00	28,766	166,900	7.15	1.91
DELAWARE	20,328	122,400	2.32	0.55	23,305	130,400	1.26	0.23
FLORIDA	22,264	114,500	2.64	0.67	21,557	105,500	2.24	0.56
GEORGIA	20,466	97,200	2.90	0.64	21,154	111,200	1.88	0.32
LOUISIANA	17,326	90,300	1.25	0.18	16,912	85,000	0.84	0.15
MAINE	21,484	119,100	1.80	0.33	19,533	98,700	1.09	0.21
MARYLAND	22,505	121,500	1.20	0.26	25,614	146,000	2.75	0.40
MASSACHUSETTS	25,666	197,000	5.83	0.95	25,952	185,700	5.59	0.85
MISSISSIPPI	17,899	85,300	0.61	0.20	15,853	71,400	0.50	0.17
NEW HAMPSHIRE	26,656	164,900	2.39	0.33	23,844	133,300	1.23	0.18
NEW JERSEY	26,279	162,800	2.69	0.43	27,006	170,800	4.69	0.70
NEW YORK	22,230	216,100	6.27	1.13	23,389	148,700	4.10	0.83
NORTH CAROLINA	19,574	116,400	2.52	0.45	20,307	108,300	1.50	0.25
RHODE ISLAND	26,041	160,800	3.82	0.78	21,688	133,000	1.77	0.34
SOUTH CAROLINA	20,484	129,600	5.11	1.20	18,795	94,900	1.65	0.39
TEXAS	16,808	68,555	0.39	0.10	19,617	82,500	1.24	0.26
VIRGINIA	20,528	109,000	1.36	0.21	23,975	125,400	2.12	0.27

a whole. In five of the states where the coastal county income is lower that of the state's income, the difference in PCPI is less than $1,000. In 12 states, the median house price is higher in the coastal counties. In several states, the difference is even more than 20 percent. The median house price tops $150,000 in the coastal counties of six states. And in 15 states, the percentage of $500,000 or $1 million homes in the costal counties exceeds the percentage of such homes in the state as a whole. In Maryland and Virginia, two of the states with fewer expensive houses on the coast, the statistics are skewed due to the exclusion of the affluent counties surrounding Washington, DC. In Louisiana, the coastal parishes rank above the state in these measures of economic well-being. Texas is the one state where coastal counties are notably poorer than the state as a whole.

Coastal counties are often large and might include areas twenty miles or more inland. Thus, the county may be too large a unit of analysis to understand which properties are most at risk of hurricane damage.

Table 3 reports economic, demographic, and housing characteristics of the census tracts of the coastal counties in Alabama and Mississippi, as well as the census tracts along Lake Pontchartrain in Orleans Parish, Louisiana. These are the neighborhoods that are actually on the coast, or Biloxi Bay or Mobile Bay.[17] These are the coastal areas of Alabama, Louisiana, and Mississippi that sustained the brunt of Katrina's force and that were covered by each state's windstorm insurance pool. The coastal neighborhoods in Mississippi and Alabama are some of the most economically advantaged parts of these

17. For Alabama, the coastal census tracts are very close to the entire area eligible for coverage in the beach pool.

TABLE 3: COASTAL AND LAKEFRONT CENSUS TRACTS

	ALABAMA		MISSISSIPPI		ORLEANS PARISH, LOUISIANA		
	COASTAL	STATE	COASTAL	STATE	LAKEFRONT	PARISH	STATE
% WHITE	87.06	71.10	79.39	61.34	49.47	28.11	63.91
% BLACK	8.86	25.93	14.02	36.33	46.90	67.10	32.32
% HISPANIC	1.24	1.63	2.39	1.33	2.55	3.10	2.41
% POVERTY	10.48	16.10	12.45	19.93	10.24	27.94	19.64
PCPI	$22,074	$18,189	$19,614	$15,853	$26,326	$17,258	$16,912
MEDIAN HOUSE-HOLD INCOME	$41,940	$34,135	$37,992	$31,330	$46,087	$27,133	$32,566
MEDIAN HOUSE PRICE	$129,200	$85,100	$93,300	$71,400	$137,900	$87,300	$85,000
% HOMES OVER $500K	3.92	0.87	1.04	0.50	2.03	2.28	0.84
% HOMES OVER $1 MILLION	0.98	0.21	0.21	0.17	0.00	0.31	0.15

states. Coastal PCPI is $19,600 in Mississippi, about 24 percent higher than PCPI for the state as a whole, and $22,100 in Alabama, 21 percent higher than the state's PCPI. The median housing price in coastal Mississippi is $93,300, 31 percent higher than the state average. In coastal Alabama, median housing prices are 51 percent higher than the state average. Almost 4 percent of homes in coastal Alabama are worth over $500,000, and 1 percent are worth over $1 million, about four times the proportions for the state as a whole. These percentages are higher for coastal Mississippi as well, although the difference is not as dramatic.

Other measures of income (median household or family income) and poverty rates confirm that the coastal areas of Alabama and Mississippi are, on average, much more affluent than the states as a whole. The lakefront areas of Orleans Parish (New Orleans) are also affluent relative to the parish as a whole and the state. PCPI in the lakefront census tracts of Orleans Parish is over $26,000, 50 percent higher than PCPI in the parish as a whole and the state. Median household income and median house price also reflect that these neighborhoods are not disadvantaged. Demographic variables also show that the coastal neighborhoods have smaller minority populations than the states and that the lakefront areas of Orleans Parish have smaller minority populations than New Orleans as a whole. The Mississippi and Alabama wind pools subsidize some of the wealthiest residents of the states and are not substantially involved in alleviating the impact of natural disasters on the poor or minorities.

While, as a group, residents of the U.S. Gulf and Atlantic coasts are not economically disadvantaged, poverty does exist in coastal areas. The lowest coastal county poverty rate among coastal states is 4.5 percent in New Hampshire. Thus, the question could still be asked: wouldn't poor and low-income coastal residents face financial hardship if the insurance pools didn't exist?

If below-market insurance was not available, some lower-income residents would undoubtedly end up moving out of the area. But this would not be all bad. Hurricanes have a disproportionate impact on poor and low-income residents who are less likely to evacuate,[18] less likely to have full replacement cost insurance coverage, and have fewer resources (apart from insurance) for recovery. If fewer low-income individuals lived in coastal areas, perhaps because they never moved there in the first place, these impacts would be lessened. Furthermore, assistance for low-income households could be better accomplished through tax credits for insurance premiums instead of a mechanism that distorts the price of coverage for all policyholders. Allowing a market price to prevail for insur-

18. See Nicole Dash and Hugh Gladwin, "Evacuation Decision Making and Behaviorial Responses in Individual and Household," *Natural Hazards Review*, forthcoming.

ance and subsidizing coverage for the poorest households would be far less costly and disruptive than subsidizing all insurance, including coverage on half-million dollar homes. And, of course, low-income households have to pay the assessments imposed on homeowners insurance to cover the losses of the state hurricane pools.

B. Insurance Pools and Economic Development

The active economic development of coastal areas is another commonly offered policy rationale of state hurricane pools. However, economic development is a dubious government policy goal. Where production, shopping, and consumption occur is a minor issue from the standpoint of the national economy. A new factory or shopping center typically increases property values in the local real estate market. The same effect occurs wherever the factory or shopping center is located, so local property owners care about which location is chosen even though the choice may not matter for the performance of the national economy. Government economic development programs end up offering tax breaks and subsidies to try to influence location decisions, and states and cities engage in a costly competition to attract factories, major retailers, and sports teams.

Economic factors do affect some location decisions—transportation costs can be reduced by locating near natural resources or customers, and economies of agglomeration are important in some industries. The economic factors favoring coastal development are primarily the value so many people place on living near the sea, as well as international shipping in certain industries. But economic development on hurricane-exposed coasts, as opposed to further inland, entails added costs from hurricane damage. As discussed above, individuals and businesses will make more efficient choices when they pay the full cost (or full cost of insurance) of locating near the coast. When hurricane losses cannot be shifted to others, only businesses and people who value coastal locations more than the extra costs will assume the risk of hurricane damage.

Subsidized property insurance reduces the cost of living along coastal areas. This should increase the number of persons and the amount of property along the coast, which in turn should increase the impact of hurricanes. Determining the marginal impact of hurricane insurance pools on the growth of these coastal regions is difficult because coastal county populations grew at a much faster rate than did the United States as a whole in each decade of the twentieth century. Nevertheless, an examination of the change in state coastal county populations by decade between 1950 and 2000 sheds some light on the impact of insurance pools on population growth.

I calculated the census-to-census population change of the coastal counties of each of the 18 Atlantic and Gulf Coast states and then divided the sample into states with a beach pool and states without a beach pool. The average population increase for states with beach pools is 413,000 persons per state per decade, compared with an average increase of 153,900 persons per state per decade when beach pools are not present. Given that all of the decades with beach pools occurred in the later years of the sample when state populations were larger, population growth in percentage terms was roughly equal to 18 percent in states with insurance pools and 17.4 percent in states without insurance pools. Nonetheless, the number of persons moving to the coast, which determines the amount of property at risk, has been greater since states established hurricane pools.

> Assistance for low-income households could be better accomplished through tax credits for insurance premiums instead of a mechanism that distorts the price of coverage for all policyholders.

As another test, I compared the population growth in each coastal county in the seven states with wind pools during the decade immediately prior to and following establishment of the plan. Of the 76 counties in the seven states, 55 experienced faster population growth (a larger percentage change in population) in the decade after the state established a wind pool than in the prior decade. The mean population change was a 41.5 percent increase in the decade after establishment of the pool compared with a 25.5 percent population increase in the preceding decade. The population of the coastal counties of Mississippi (Hancock, Harrison, and Jackson) increased from 239,944 in 1970, the year after category five Hurricane Camille struck, to 376,461 in 2005 when Katrina deluged the area with an even greater storm surge. Some portion of this increase in population—and consequent death and

property damage—is a by-product of affordable insurance for economic development.

Economic development today creates potential insurance problems for decades to come. Factories, offices, condos, hotels, and large homes are long-lived, immovable investments. Once constructed, the low cost of operation usually dictates continuing to use these buildings. Thus, a burst of construction fueled by below-market premiums motivated by economic development goals today creates additional property that will need insurance for decades to come. In addition, the new property owners enlarge the established constituency that fights to maintain affordable insurance rates through hurricane pools. Society will have to live with the consequences of coastal economic development efforts for a long time.

4 Policy Recommendations

The problems caused by state-run insurance pools are easy to see. First, rates charged to homeowners and businesses under these plans do not cover the full expected cost of insurance. Consequently low-risk policyholders end up paying for the losses of high-risk properties through post-disaster assessments, with state and possibly federal taxpayers also in line to cover extremely large losses. Second, forcing low-risk policyholders or taxpayers to pay for hurricane damage is unfair, as these people do not get to share the benefits of living near the coast. Third, as coastal counties and neighborhoods are hardly economically disadvantaged, the primary beneficiaries of the insurance subsidies are relatively well-off Americans. In light of these problems, four policy responses are recommended:

1. Introduce a moratorium on the creation of new hurricane pools or on the expansion of existing ones, restrict coverage at current subsidized rates for new construction in existing pools, and phase out the existing subsidies and pools over a given period, perhaps ten years.

2. As premiums rise to market levels, give tax credits or means-tested insurance vouchers to current low-income residents. However, do not provide such credits or vouchers to low-income residents who are new to the area.

3. If a moratorium on creation or expansion of pools is not possible, better align the incentives between policy makers and taxpayers by implementing mechanisms that increase the current costs of state action. For instance, instead of relying primarily on assessments to cover potential excess losses, purchase reinsurance or issue catastrophe bonds to cover a fixed proportion of potential excess losses.

4. Finally, offer actuarially justified discounts for mitigation measures.

From an economic perspective, the simplest solution to the excessive development of hurricane-exposed coasts is to remove the insurance subsidies. If new development must cover its full cost, the owners will build only if they are willing to incur the damages from hurricanes. Less-valued development will shift to safer locations inland. Elimination of insurance subsidies does not preclude future development in coastal areas, as land-use restrictions might, but only requires new development to pay the market price of insurance.

Preventing extension of insurance pools and further growth in areas served by existing pools is a crucial first step toward preventing the problem of excessive development from getting worse. Existing construction offers a different problem, however, because continuing to use already completed buildings is efficient, and buildings cannot readily be moved. However, states could phase out the subsidies in insurance for existing construction over a reasonable period, allowing owners to adjust to paying market premiums.

One complication with transitioning away from insurance pools is the impact of higher market insurance premiums on low-income households. However, to the extent that a goal of an insurance pool is to provide below-cost insurance for the poor, there are much better ways to do so. The second policy recommendation rests on the idea that one of the best and most politically viable ways to do this is either to provide tax incentives or insurance vouchers. For example, states with an income tax could enact a means-tested tax deduction for premiums paid by low-income households. As discussed previously, allowing a market price to prevail for insurance and subsidizing coverage for the poorest households would be far less costly and disruptive than subsidizing all insurance—including coverage on half-million dollar homes in relatively affluent coastal neighborhoods. However, states should limit such subsidies to poor families who currently reside in high-risk areas.

The incentives that politicians face suggest that the prospects for the elimination of hurricane pools are bleak. Because investments in coastal property are long-lived and immobile, owners recognize that the value of their property is dependent on the availability of subsidized insurance. The beneficiaries of wind pool insurance subsidies know who they are and are now relatively numerous (1.8 million policies in force in the seven state wind pools), so they wield considerable political power. The cost of wind pools are spread by assessments over the larger number of low-risk state policyholders. Therefore, the abolishment or major reform of insurance pools is unlikely. The costs of pools are not merely dispersed; they do not occur immediately with the establishment of the pool. Because catastrophic hurricanes are expected to occur infrequently, a wind pool with highly subsidized rates may not have to impose assessments for years or even decades. Thus, state politicians can provide benefits now in the form of lower premiums to high-risk policyholders with the costs deferred to some indefinite future date. Continued growth in coastal areas merely increases the constituency for insurance subsidies, making elimination of the subsidized premiums even less likely in the future (although illustrating the importance of restricting subsidies now for future construction).

The prospects for major reform may not be quite so bleak, however. Overall, citizens do not support subsidized property insurance for high-risk properties. A recent American Consumer Institute survey on insurance price regulation found that 84 percent of respondents were unaware of price subsidies for coastal properties and that 64 percent opposed these policies.[19] This is true especially in Louisiana and other coastal states that seem to be seeking new ways to recover from Katrina and, more importantly, avoid similar consequences from disaster in the future. In Louisiana, policy makers have shown interest in reducing and perhaps privatizing LCPIC, which is now the third-largest property insurer in the state. Besides, eliminating wind pools alone might not provide the expected benefits. If states make an effort to eliminate state insurance pools, they should also reform disaster relief policy to avoid perpetuating problems.

Insurance and disaster relief are, to some degree, substitutes. Consider the case of flood insurance. Many homeowners who are required to carry flood insurance often drop it without consequence. If residents are not insured and government (both state and federal) cannot commit to cover uninsured losses after a disaster, eliminating subsidized insurance may increase disaster relief costs.[20] Suppose that a hurricane would cause $2 billion in insurable property damage. With subsidized insurance available through a pool, at-risk policyholders may have paid and will pay after the event $1 billion in premiums, leaving other state policyholders to pay the remaining $1 billion in assessments. Alternatively, without subsidized insurance, if people have not purchased insurance at market rates, there could be $2 billion in uninsured losses that taxpayers would pay through disaster relief. The extent to which subsidized insurance increases disaster losses is consequently difficult to establish with certainty.[21] If an effort were made to eliminate state insurance pools, disaster relief policy should also be looked at to avoid perpetuating many of the current problems.

The incentives that politicians face suggest that the prospects for the elimination of hurricane pools are bleak

If a moratorium on pools and the implementation of tax credits is not feasible, there is a third policy option: reform state wind pools. Wind pools are attractive to politicians because they offer benefits—lower insurance premiums—to a well-defined group of beneficiaries now, while the costs do not occur until sometime in the future when a major hurricane strikes. To offset this political advantage, states could be required to purchase reinsurance or issue catastrophe bonds to cover some excess losses in lieu of relying exclusively on assessments and possible legislative appropriations or bond issues. Either requirement would force a current expenditure on state governments in support of insurance pools and prevent politicians from benefiting from starting or expanding a program at no cost. The requirement could also apply to expanding a program, so a 50 percent increase in expo-

19. Stephen Pociask, *Consumer Opinions on Insurance Price Regulation* (Reston, Virginia:American Consumer Institute, 2007), 2.
20. Howard Kunreuther and Mark Pauly, "Rules Rather than Discretion: The Lessons from Hurricane Katrina," *Journal of Risk and Uncertainty* 33, no. 1–2 (2006): 101–16.
21. Scott E. Harrington, "Rethinking Disaster Policy after Hurricane Katrina," in *On Risk and Disaster*, ed. R. J. Daniels, D. F. Kettl, and H. Kunreuther (Philadelphia: University of Pennsylvania Press, 2006), 203–21.

sure would require 50 percent additional reinsurance. Such a provision would be unlikely to cause states to phase back their existing plans, but might slow the expansion or creation of beach pools. Another advantage would emerge if all states with wind pools purchased insurance or issued catastrophe bonds to back a portion of the plans' potential losses. Yardstick competition would reveal which states are poorly managing their risk exposure. Poor control of exposure, such as failing to conduct rigorous inspections before issuing new policies, would lead to a higher price for reinsurance or a higher interest rate for catastrophe bonds. This would provide a signal to residents *before* a major hurricane strikes, perhaps in time to make adjustments and limit exposure, damage, and devastation.

Finally, if they are not phased out, wind pools should offer actuarially fair discounts for mitigation. Mitigation should be used by residents to reduce insurance rates whenever such measures reduce expected hurricane damage by more than their cost. Premium discounts provide a means to encourage this. In addition, premium discounts are preferable to mandates requiring all at-risk policyholders to install hurricane shutters or reinforced garage doors because homeowners are not forced to incur the mitigation cost. If the homeowner is willing to pay a higher premium, they need not mitigate. This can be important for homes that are difficult to retrofit or for homeowners who think that mitigation detracts significantly from the appearance of their property.

Conclusion

Insurance is a remarkable institution that, when successful, spreads risk over a large number of people. It allows people opportunities they would never have without its presence. However, because of the nature of the risk, the case of natural disaster insurance is different from that of other, more standard, types of insurance. There are a few important issues that one needs to keep in mind to understand the policy issues associated with insuring natural disasters. The infrequency and consequent ambiguity of natural disasters makes them difficult to insure, meaning that in an unregulated market they will cost more to insure per dollar of expected loss. Also, because natural disaster damage touches everyone in a given region, it makes the pooling of risk trickier for an insurance company than for non-natural disaster related events. This does not mean, however, that regulation is the best answer. As evidenced by the rebuilding process after Katrina and other major hurricanes, manipulation and regulation of the insurance industry in coastal states has led to numerous problems.

State-run insurance pools impose large costs on the residents of coastal states in the United States. While the creation of these pools was supposed to overcome perceived problems of insurance, the pools have created more problems than they have solved. Insurance pools distort the economic development of coastal regions with dire consequences: the provision of below-cost insurance encourages people to move to areas that are at very high-risk of being hit by hurricanes. This leads to more lives lost than would otherwise be the case. Also, because there is more economic development and therefore housing and businesses in coastal regions, when a hurricane strikes, the residents end up being bailed out by assessments that states impose on the remaining citizens—people that had nothing to do with the choice to build a $750,000 house next to the ocean.

In the wake of Hurricane Katrina, now is an opportune time to look at the vicious cycle that has led to more and more people being covered by state-run insurance pools. An important first step in ending this cycle would be a moratorium on both the creation of new pools and the expansion of existing ones. Eliminating these pools will be difficult due to entrenched interest groups and will require reforming not only insurance regulation, but disaster assistance as well. If the policy goal of insurance pools is to provide poor people with below-market insurance, a much better way for states to do so is through direct subsidies. Moreover, since the insurance pools are an easy way for current politicians to impose costs on future generations, politicians who create the pools must be required to bear some of the cost. Finally, premiums for existing properties should allow actuarially justified reductions for mitigation measures that can reduce the damage from future hurricanes.

These legislative and regulatory changes could help change a system that is unnecessarily costly, inefficient, unfair, and most importantly, draws more people into potentially deadly geographic areas. The difficult rebuilding process in New Orleans is a good reminder that changes like the ones proposed are the first step toward avoiding future disasters on the scale of Katrina.

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