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# Residential Insurance on the U.S. Gulf Coast in the Aftermath of Hurricane Katrina

## A Framework for Evaluating Potential Reforms

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# Residential Insurance on the U.S. Gulf Coast in the Aftermath of Hurricane Katrina

## A Framework for Reform

James W. Macdonald, Lloyd Dixon, Laura Zakaras[1,2]

July 2010

*"It has been said that civilization is a race between education and catastrophe. With Katrina, we have had the catastrophe, and we are racing inexorably toward the next. Americans want to know: what have we learned?"*[3]

The hurricane seasons of 2004 and 2005, which brought such devastating losses of life and property, threw the residential insurance market in the Gulf States into turmoil. Insurance premiums skyrocketed, and a number of private insurers retreated from coastal regions. Government insurance programs that have stepped into the breach and subsidies by taxpayers and policyholders in low-risk areas raise concerns that premiums in high-risk areas provide homeowners inadequate incentives to invest in measures that will reduce risk. To make matters worse, thousands of residents resorted to the courts to resolve coverage disputes with their insurers. Until an improved system for mitigating and insuring hurricane risk is developed, storms will continue to cause record-setting losses to life and property, ever increasing federal disaster relief, and major economic disruption in Atlantic and Gulf coast states.

Policymakers are still deeply divided about how to reform the residential insurance system. At the center of the debate is the proper role of government in insuring both wind and flood. Different interest

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[3] U.S. House of Representatives, 2006.

groups have offered a range of proposals. Some focus on improving the private sector's ability to provide wind and flood coverage. Others propose public-private partnerships to insure hurricane losses. Still others believe that the government should take the lead role——either by including wind risk in the National Flood Insurance Program (NFIP) or by creating a federal reinsurance program for "mega-catastrophes" like Katrina. So far, there are few signs that consensus is building behind any of these approaches.

This paper is intended to inform the policy debate by diagnosing the problems facing the residential insurance market and outlining some policy responses that merit consideration. We organize the paper around the following questions:

- What are the problems facing the residential insurance market in Louisiana and Mississippi, the states most devastated by Hurricane Katrina?
- Why is it difficult for the private sector to solve these problems?
- Why is it difficult for the public sector to solve these problems?
- How do homeowners contribute to these problems?
- What options should be considered to create efficient and equitable insurance system for residential properties along the Gulf coast?

Although we do not make specific policy recommendations in this paper, we propose objectives for a well-functioning residential insurance market, examine why the current constellation of institutions and actors cannot achieve these objectives without policy reform, and identify a range of policy reforms that warrant further consideration for improving societal outcomes.

This research is an outgrowth of a previous paper that analyzed the commercial wind insurance market after Katrina (Dixon, Macdonald, and Zissimopolous, 2007). That analysis was based on a review of publicly available reports and 69 interviews with a broad range of parties including insurance buyers, insurers, catastrophe modeling firms, financial rating agencies, reinsurers, and commercial lenders. To extend that research to the residential insurance market, we conducted a similar review of the published literature and conducted more than 40

additional interviews and group meetings with a broad range of concerned parties including coastal residents, consumer action groups, insurers, reinsurers, regulators, catastrophe modeling firms, journalists, and legislators.

**TURMOIL IN THE RESIDENTIAL INSURANCE MARKET POST-KATRINA**

Seven hurricanes in 2004 and 2005, historically unprecedented in their combined level of destruction, have had a profound effect on the residential insurance market in the Atlantic and Gulf States. As Table 1 shows, these storms caused nearly $90 billion of insured wind losses to property, both residential and commercial. One-half of those losses ($45.1 billion) was caused by Hurricane Katrina alone.

**Table 1: Insured Property Damage Losses from Wind and Flood During the 2004-2005 Hurricane Season**

| Hurricane | Category | Year | Insured Wind Losses (billions of 2009 dollars) | Insured Flood Losses (billions of 2009 dollars) |
|---|---|---|---|---|
| Katrina | 3[a] | 2005 | 45.1 | 17.7 |
| Wilma | 5 | 2005 | 11.3 | 0.4 |
| Rita | 3 | 2005 | 6.2 | 0.5 |
| Ivan | 5 | 2004 | 8.1 | 1.8 |
| Charley | 4 | 2004 | 8.5 | 0.1 |
| Frances | 4 | 2004 | 5.2 | 0.2 |
| Jeanne | 4 | 2004 | 4.2 | 0.1 |
| Total | -- | -- | 88.7 | 20.8 |

[a] Hurricane Katrina was a category 5 hurricane when it was over the Gulf, but a category 3 storm when it hit land. However, Katrina's storm surge was comparable to those of higher intensity storms.
Source: Wind loses from the Insurance Information Institute, available at: http://www.iii.org/media/facts/statsbyissue/hurricanes/. Flood losses from http://www.fema.gov/business/nfip/statistics/sign1000.shtm. Flood losses are adjusted to 2009 dollars use Bureau of Labor Statistics Inflation Calculator; http://www.bls.gov/data/inflation_calculator.htm.

Although Katrina pounded many states along the coast, Louisiana and Mississippi were the most severely hit. The vast majority of the 275,000 homes that were damaged or totally destroyed during Katrina were in these two states. The Mississippi Department of Insurance reported that 240,000 claims were paid to residents of Hancock, Harrison, and Jackson counties within 12 months of the storm, totaling $8.4 billion. The

total for all six Mississippi coastal counties was 263,744 claims, representing over $8.7 billion.[4] Nearly half of the property damage losses caused by Katrina ($20 billion) occurred in New Orleans, and 78 percent of those damages were in residential communities (Interagency Performance Evaluation Task Force, 2009). Excluding flood claims, 58 percent of the 720,294 Louisiana claims paid as of year-end 2006 were from the homeowners' line of insurance. In Louisiana, Hurricane Rita added another $2.6 billion to the state's 2005 insured storm losses, with over 201,000 claims (Louisiana Department of Insurance, undated).

These figures do not include payments for flood damage, which were covered by the federal National Flood Insurance Program (NFIP). As Table 1 shows, NFIP payments resulting from Katrina as of April 2010 amounted to more than $17 billion in 2009 dollars——more than the combined total of the nine next largest flood losses. The average payment on each of the 167,000 claims to NFIP was approximately $106,000 in 2009 dollars.

The enormous scale of these losses cannot be attributed to the ferocity of natural forces alone. Decades of population growth and unrelenting construction in coastal communities magnified the risk of widespread damage. In Florida alone, the population doubled from 1970 to 2001 with most of the newcomers moving into coastal areas (Newman, 2005, pp. 3-4). Other important factors were the persistent failure of local communities to adopt and enforce strict new building codes and the difficulty of providing incentives for policyholders to invest in reducing the risk of damage to existing homes. In the case of Katrina, the neglect of public engineering systems, such as the levees that were breached in New Orleans during Katrina, significantly amplified damage.[5]

As we describe below, the hurricanes of 2004 and 2005 changed the cost and availability of wind insurance in the Gulf coast states, and these changes created serious problems not just for private insurers, but for residents of coastal areas, as well as state and federal

[4] In total, Katrina resulted in 486,913 claims in Mississippi with a value of almost $12 billion paid by insurers, the state pools, and the NFIP. This information was obtained directly from the Mississippi Department of Insurance and is calculated as of late 2006.

[5] By one account, if the levees had not given way during Katrina and only rainfall and levee overtopping had inundated the streets of the city, the floodwaters would have been reduced by two-thirds (Interagency Performance Evaluation Task Force, 2009).

taxpayers.

**Soaring Premiums, Rising Deductibles, and Reduced Availability in the Private Market**

Prices for private residential wind insurance have increased dramatically while access to coverage has declined in areas exposed to the most risk of wind and flood damage. Between 2001 and 2007, average annual premiums in Louisiana increased from less than $800 to over $1,200. These state averages obscure large differences within states between coastal and inland premiums. In some cases, residential premiums along the coast rose by 300 to 400 percent (Kunreuther & Michel-Kerjan, 2009, p. 59, 71-74).

Homeowners are also being required to retain much more wind risk through higher deductibles. As early as 1992 in the aftermath of Hurricane Andrew, private insurers began to shift windstorm risk back to residents through relatively new “named storm” and “hurricane” deductibles——a trend that has received little attention in the research literature.[6] Instead of the traditional $500 or $1,000 retentions, the new deductibles are a percentage of the amount of dwelling insurance purchased. In Mississippi and Louisiana, these deductibles typically range from 2 percent to 5 percent, but higher amounts are not uncommon. In Florida, deductibles of as much as 25 percent are permitted on high-value homes (Kunreuther and Michel-Kerjan, 2009).[7] In some states, the special deductibles apply separately to every loss event during the year. Thus, homeowners exposed to both Hurricanes Katrina and Rita in 2005, or to Ike and Gustav in 2008, could have had to pay the deductible twice. Recognizing the financial burden this presents to almost all policyholders, several states have enacted——or are considering—— legislation to limit the use of these deductibles within the admitted market.[8] For example, Louisiana’s House Bill 333 enacted in 2009

[6] When this issue is considered, the focus tends to be on the extent to which residents benefit from reduced premiums and the sensitivity of the deductible choice to the loss expectations of the buyer (e.g. see Kunreuther and Michel-Kerjan, 2009, Chapter 10).

[7] On a $300,000 policy, for example, a resident with a 5 percent obligation would be responsible for the first $15,000 of insured damages from a major storm. The Insurance Information Institute provides a comprehensive discussion of these deductibles and the different approaches in each state at http://www.iii.org/media/hottopics/insurance/hurricanwindstorm/.

[8] Most insurance sold in the nation is in the “admitted market” that is regulated by each state’s insurance department. Insurance sold in this market

prevents admitted homeowners' insurers from imposing more than one deductible per year on all events that may be subject to the named storm or hurricane retention.[9]

Despite increases in premiums and deductibles, many of the largest private insurers have reduced underwriting in coastal areas. In January 2009 Florida's largest homeowners' insurer, State Farm Florida Insurance Company, announced that it planned to entirely stop underwriting Florida property insurance after the state rejected its 47 percent rate increase request.[10] Due to denial of rate increases and other reasons discussed below, other major insurers have also taken steps to reduce their exposure to major storms, including canceling or not renewing thousands of policies, excluding windstorm coverage from policies that are renewed, lowering coverage limits, and raising deductibles. These strategies, which have caused an outcry among coastal residents, have led states to offer more state-backed policies for windstorm damage in the "residual" market.

**Expansion of Subsidized Public Programs**

Taken together, these trends in the private sector have led to rapid growth in the state and federal insurance programs offering often-subsidized wind and flood insurance.

**Wind Insurance.** Table 2 shows the surge in wind-storm underwriting risk by the state-backed residual market in coastal states since 2004, when private insurers began retreating from the market. Although these programs were intended to be insurers of last resort, since Katrina they have increasingly become the primary source of insurance for windstorm damage in coastal states.

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must comply with the given state's rules regarding acceptable policy forms and rates for the given type of insurance. The advantages of purchasing insurance from admitted insurers include this oversight by state regulators and also the availability of guaranty fund reimbursements if the insurer subsequently fails. When an insurance in unavailable from the admitted market, each state has rules that allow commercial or residential buyers to purchase insurance from the "non-admitted market." Insurance in this market is not subject to state form and pricing controls. In addition, most states guaranty funds provide no reimbursement for insurance purchased from insolvent surplus lines insurers.

[9] See http://www.legis.state.la.us/billdata/streamdocument.asp?did=667122.

[10] We note that in December 2009, State Farm Florida announced a compromise agreement with Florida regulators that allowed the insurer to discontinue 125,000 of its 810,000 property insurance policies in the state and implement a rate increase of 14.8 percent (State Farm, 2009). In June 2010, the insurer announced its plan to discontinue its role in adjusting NFIP flood losses under the WYO program (St. John, 2010).

**Table 2: Combined Policy Limits of Policies Written by State-Backed Wind Insurers ($ billions)**

| State Pool or Insurance Company | 2004 | 2008 | Percent Increase |
|---|---|---|---|
| Alabama Beach Pool | 0.3 | 1.8 | 448 |
| Florida Citizens Ins. Co. | 202.8 | 436.8 | 115 |
| Georgia Fair Plan | 0.6 | 2.0 | 258 |
| Mississippi Wind Insurance Underwriting Authority | 1.6 | 6.3 | 283 |
| Louisiana Citizens Property Insurance Corporation | 14.8[a] | 28.5[b] | 91 |
| New York Fair Plan | 3.5 | 5.2 | 47 |
| North Carolina Beach Plan | 31.6 | 73.5 | 132 |
| South Carolina Wind & Hail Underwriting Authority | 6.0 | 17.0 | 184 |
| Texas Windstorm Insurance Association | 20.8 | 58.6 | 182 |
| Total | 282.2 | 629.7 | 123 |

[a] As of December 2005.
[b] As of December 2009.
Source: Individual pool or association web sites except for Louisiana which is taken from GAO, 2010, p. 19.

Although these programs are helping meet the demand for affordable coverage, they have incurred huge deficits that arise from the underfunding of risk. Mississippi and Louisiana are prime examples. Mississippi's residual market pool, called the Mississippi Windstorm Underwriting Association (MWUA) requested a 398 percent rate increase for its residential insurance policies, which are limited to windstorm damages, but the state approved only a 90 percent increase.[11] To keep premiums down, the state received approval to use federal grant funds to subsidize windpool rates: $50 million was approved in 2006, $30 million in 2008, and $40 million in 2009. In addition, the state's insurers were assessed $525 million to cover MWUA deficits following the 2005 hurricane season (GAO, 2007a, p. 24), and $20 million per year of state insurance premium tax revenue was transferred to the fund from 2007 through 2010 (Mississippi House of Representatives, 2007).[12] The result was that federal taxpayers as well as Mississippi taxpayers, businesses,

[11] MWUA is a not-for-profit association composed of all admitted insurers writing direct property insurance in the state.
[12] The state authorized an additional $20 million be transferred to the fund on July 1, 2009 (Insurance Journal, 2009).

and residents in lower-risk areas have subsidized wind insurance rates for residents along the Mississippi coast.

The Louisiana Citizens Property Insurance Company (LA Citizens) also sustained heavy losses——almost $1.1 billion in 2005——well in excess of its available cash reserves of about $80 million.[13] Catastrophe reinsurance paid $295 million of the loss, and the remaining deficit was financed through the combination of an assessment payable by all of the state's property insurers and the issuance of tax-exempt revenue bonds totaling almost $1 billion (GAO, 2007a). The 2008 hurricane season produced yet another major challenge for the LA Citizens, totaling $46.6 million in losses from over 55,000 new claims (mostly from Hurricane Gustav).

**Flood Insurance.** Because residential policies exclude damages due to flood, including the "storm surge" that is common to most hurricanes, the NFIP has been underwriting flood risk since 1968.[14] The number of policies written by the NFIP grew substantially following the 2004-2005 hurricane season. As can be seen in Table 3, growth was particularly robust in the Gulf States, up 41 percent compared to 20 percent for the nation as a whole. However, despite some significant floods in the rest of the nation, we note a surprising 7 percent decrease in the rest of the nation (or "other states").[15]

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[13] The Louisiana Citizens Property Insurance Corporation "was established in 2003 by the Louisiana legislature as a nonprofit corporation to operate insurance plans effective January 1, 2004 which function exclusively as residual market mechanisms to provide essential property insurance for residential and commercial property applicants who are unable to procure insurance through the voluntary market. The Company is the successor to the program established by Act 424 of the 1992 Regular Legislative Session designated as the "Fair Access to Insurance Requirements Plan" or otherwise known as the Louisiana Joint Reinsurance Plan Fair Plan) and the Louisiana Insurance Underwriting Plan (Coastal Plan)" (Louisiana Citizens Property Insurance Corporation, 2008).

[14] The standard homeowners insurance policy (called the "HO3" form) excludes water damage losses from "flood, surface water, waves, tidal water, overflow of a body of water, or spray from any of these, whether or not driven by wind" (Insurance Services Office, Inc., 1999).

[15] Flooding is clearly a national issue and is not in any sense limited to the Gulf Coast. In 2007, for example, the NFIP reported total flood payments of over $25 million in Oklahoma, $26 million in Ohio, and $28 million in Washington state compared with $22.5 million in Louisiana, $4.6 million in Florida, $1.8 million in Mississippi, and less than $1 million in Alabama. Data on NFIP claims payments by state is available at:
http://www.fema.gov/library/viewRecord.do?id=3174

**Table 3: Number of NFIP Policies in Force**

| Region | 2004 | 2007 | 2009 | Percent Change 2004-2009 (percent) |
|---|---|---|---|---|
| Gulf Coast | 915,041 | 1,293,734 | 1,289,967 | 41 |
| Alabama | 41,336 | 54,951 | 54,999 | 33 |
| Mississippi | 41,946 | 78,270 | 74,542 | 78 |
| Louisiana | 376,681 | 499,544 | 481,580 | 28 |
| Texas | 455,078 | 660,969 | 678,846 | 49 |
| Florida | 1,851,905 | 2,199,921 | 2,165,104 | 17 |
| Northeast coastal states[a] | 450,686 | 560,863 | 628,291 | 39 |
| Southeast coastal states[b] | 404,882 | 522,096 | 536,839 | 33 |
| Other states | 1,044,932 | 1,077,335 | 977,529 | -7 |
| National | 4,667,446 | 5,653,949 | 5,597,730 | 20 |

[a] Maine, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland.
[b] Virginia, North Carolina, South Carolina, Georgia.
Source: http://www.fema.gov/business/nfip/statistics/fystats_maps.shtm.

At the time Katrina hit, NFIP reserves were low. As a result, the NFIP needed to borrow $20 billion from the Treasury Department to cover claim payments following the 2005 hurricane season—a dramatic reversal from the cumulative net outlays (in nominal dollars) of only $300 million in the 20 years preceding Katrina (Marron, 2006, p. 3).[16]

**Inadequate Incentives for Risk Mitigation and Appropriate Land Use**

Subsidies from taxpayers and policyholders in low-risk areas to policyholders in high-risk areas raise concerns that insurance premiums do not accurately signal the degree of risk posed by specific properties. The appropriate signal is sent when the premium equals the expected annual loss on the property—in other words, when the rates are *actuarially fair*.[17] When premiums are kept below expected loss to make policies more affordable, they discourage investments in risk mitigation and encourage construction in high-risk regions. The economic argument for creating incentives to mitigate risk is compelling: According to one

[16] *Net outlays* refers to the excess of claim payments and administrative expenses over premiums and fees.

[17] The probabilities of all storm sizes (even catastrophic ones) should be included in calculating expected loss. For simplicity, we include the costs of pricing, writing, and adjusting insurance policies in the definition of expected annual loss, even though "loss" in insurance terminology usually refers to payouts to policyholders.

recent study, every $1 spent of risk reduction saves $4 in post-loss recovery costs (National Institute of Building Sciences, 2005).[18] Another report concludes that a $2.5 million investment in loss prevention resulted in $500 million in avoided losses during the 2005 storm season (Green, 2006). In addition, some argue that more conservative land use is the single most important practice in managing hurricane risk. According to one recent task force report, the simplest approach to reducing such risk "is managing land use to avoid placing more people and property in areas vulnerable to hazards" (U.S. Army Corps of Engineers, 2009, p. 9).

As will be discussed below, it is not obvious whether subsidized public wind insurance premiums are below expected annual losses once pricing of the private reinsurance used by these programs is taken into consideration. However, the presence of large subsidies raises concern that insurance premiums diverge from expected losses, and subsidies clearly disadvantage those taxpayers and policyholders that are footing the bill.

**Multiple Policies and Coverage Uncertainty**

Because homeowners insurers often exclude wind coverage (along with the flood coverage), many homeowners in coastal regions must now purchase three insurance policies to insure the same dwelling: one policy that is underwritten by a traditional insurer covering perils like fire and theft (but not wind or flood); a second policy from the state windstorm residual market that covers only damages from wind or hail; and a third policy from the NFIP that insures flooding. In most cases, there are important differences in the amount of insurance that each policy provides, the deductible obligation that must be paid by the resident depending on the cause for a loss, and the breadth of the insurance coverage.

The separate policies also mean that each policy's coverage and the homeowner's deductible obligations depend upon determining the cause and timing of losses after a disaster. In some cases, those distinctions cannot be drawn with any certainty. In New Orleans, for example, the

[18] This ratio is based on findings for several different types of disasters, including flood, wind, and earthquake.

unprecedented flooding resulted in long delays in property inspections by claims adjusters. As a result, it was sometimes simply impossible to determine whether wind or flood caused the damages at issue. In Mississippi, the combination of devastating storm surge and high winds resulted in many so-called “slab” losses, in which the only thing left on the property was the foundation. Difficulties in identifying whether wind or flood caused specific losses—and the timing of the damage from each cause—have led to protracted disputes, many of which have ended up in litigation.

A 2006 survey by the Insurance Information Institute estimated that roughly 2 percent of the approximately one million claims filed in Louisiana and Mississippi following Hurricane Katrina were subject to litigation or mediation (Insurance Information Institute, 2006). While two percent is a small proportion, it represents about 20,000 claims.

**GOALS FOR THE RESIDENTIAL INSURANCE MARKET**

These problems illustrate just how dysfunctional the residential insurance market has become for private insurers, policyholders, and taxpayers. Because tightly regulated residential insurers have dramatically reduced their exposures in coastal areas, hurricane risk has shifted to state residual market entities. Growth in these markets has shifted risk to taxpayers and policyholders in inland areas, just as the growth in the federal flood program has transferred risk to federal taxpayers who are subsidizing the policies of some residents. In addition, wind insurance coverage limits have fallen and deductibles increased, creating greater retained risk for policyholders in high-risk areas. Adding to their burden is the necessity of purchasing multiple policies with inherent contractual uncertainties that will likely result in another wave of litigation following the next major storm.

When considering what types of reforms might improve outcomes, policymakers and other interested parties should keep in mind basic goals for the performance of a residential insurance system. We suggest four goals to guide the reform effort:

1. **Insurance premiums should create appropriate incentives to mitigate risk.** As discussed above, insurance premiums should create appropriate incentives to discourage homeowners from

locating in risky areas and encourage developers to build wind-resistant structures. When insurance premiums on a property are lower than expected losses on that property, the incentive to avoid risky areas or to build wind-resistant structures is inadequate. Analogously, when insurance premiums are higher than the expected loss, development will be unnecessarily discouraged and buildings over-engineered.

2. **Decisions by households and residential developers should factor in wind and flood risk.** It is not enough for the prices to reflect the expected losses on a property. Households and businesses need to take these prices into account when making decisions. If, for example, wind or flood insurance is not mandatory and a household does not fully appreciate the risk, the family may not purchase insurance. It is also not likely to take appropriate measures to mitigate risk, and the consequence is that losses are borne by taxpayers, charities, or others.
3. **The insurance system should pay legitimate claims efficiently and expeditiously.** Claims should be paid without undue litigation and other transaction costs to maximize the percentage of insurer expenditures that reach policyholders who have suffered losses. The expeditious resolution of claims aids rebuilding after a disaster and helps the local economy recover.
4. **The market should encourage innovation and price competition.** Innovation can result in better loss-prevention programs, policy features that better serve the needs of homeowners, and the speed and efficiency of policy payments. Competition can speed innovation and reduce inefficiency.

We will return to these goals in the last section of this paper when we set out policy options that should be considered in reforming the system. But first, we turn to an analysis of the aspects of wind and flood insurance that make it difficult to achieve these goals without making substantial policy changes. We first examine the challenges facing the private sector, then the challenges facing the public sector, and finally the challenges created by consumer behavior.

## CHALLENGES FACING THE PRIVATE SECTOR

Specific conditions make it difficult for private insurers to achieve the objectives of a well-functioning residential insurance market. We first describe conditions stemming from windstorm risk, many of which apply to flood risk as well. We then describe the challenges specific to flood risk.

### Windstorm Risk

**High Cost of Capital.** It has always been difficult for the private sector to insure low-probability, high-consequence events like major hurricanes or earthquakes. Most forms of insurance contemplate exposures that produce a high frequency of insured events, but reasonably low average cost per loss. Insured losses in most forms of insurance are also expected to be independent, occurring at a different time and in a different location than other insured losses. Lines of insurance covering high-probability events (like mortality, health problems, or auto accidents) can be priced with a high degree of certainty because recent historical loss data can be relied upon to accurately predict future losses and required premiums. When losses are able to be predicted with a high degree of certainty, the insurer does not need to hold a great deal of capital to protect against the possibility that actual losses turn out to be a significantly larger than expected losses. In such cases, the insurance premium approaches the expected annual losses on the insured asset. The risk is then insurable in the sense that the premium is attractive enough to the potential buyer to warrant purchase. In addition, because it is close to expected loss, the insurance premium provides the appropriate incentives for risk mitigation.[19]

The situation is just the opposite for windstorm risk. Losses are infrequent and can be very large when they occur. They are also correlated—a single event can affect a large number of policyholders simultaneously. These attributes make annual losses very difficult to predict, and the insurer must therefore hold a large amount of capital to protect against the possibility of insolvency.[20] The needed capital

[19] See Cummins (2006) for further analysis of these points.

[20] Holding large amount of capital can also be thought of as strategy to hedge against timing risk. An insurer may be able to fund losses from a large

can take many forms, including increased amounts of cash, highly liquid (but relatively low-yielding) securities, and reinsurance. Provisions of the U.S. tax code magnify the cost.[21] The cost of capital (which results in a so-called risk load in the premium) puts a wedge between the expected annual loss and the policy premium.

Insurers faced with infrequent but large losses turn to reinsurers for protection. Reinsurers may be able to diversify risk across the globe, enabling them to predict annual losses with greater accuracy and to hold less capital than an insurer whose business is concentrated in a particular region or country. However, because catastrophic events are rare and so large, reinsurers themselves must hold substantial amounts of capital that can force the premiums they charge to be considerably above expected annual loss, perpetuating the problem.

The cost of capital may drive the cost of the premium to many multiples of the expected loss, making insurance less attractive to potential buyers and sending the wrong signals for risk management. Kunreuther and Michel-Kerjan conclude that "catastrophe insurance premiums often are several multiples of expected claims costs" (2009, p. 138). Litan points to evidence from the Congressional Budget Office that premiums are five to seven times expected loss (2006, p. 4). However, more work is needed to better quantify the risk load for wind insurance in different settings and to better understand how it differs between insurers and reinsurers.

**Large Uncertainty about the Underlying Risk.** The stunning hurricane losses in 2004 and 2005 have made it even more challenging to underwrite windstorm risk. First and most important, these losses have shaken the confidence of some insurers in their ability to predict wind risk. Several insurers we interviewed raised doubts about whether catastrophic windstorm peril can be accurately modeled. In effect, they

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event if it had been collecting premiums for a sufficient number of years before the event occurs. However, the insurer would not have adequate reserve to pay claims if a large event occurred soon after it began collecting premiums. Timing risk does not arise when the losses in a given year can be predicted with a great deal of accuracy (such as auto accidents). In that case, the premiums collected in one year will with high probability cover the losses incurred in that year.

[21] Unlike European countries, the U.S. tax code does not permit private insurers to set aside loss reserves on a pre-tax basis before a catastrophe occurs. See GAO (2005) for a review of approaches to insuring terrorism and natural catastrophic risk in six European countries, including allowance for tax-exempt, pre-loss reserves. (See also Smetters and Torregrosa, 2008.)

are no longer convinced that the past can be relied upon to predict the future, with uncertainty about the effects of climate change contributing to the problem. Other insurers continue to believe that wind models provide a solid basis for pricing risk. The three major modeling firms used by insurers to set rates seriously under-predicted the losses caused by the 2004 and 2005 hurricanes.[22] All three firms have revised their models in various ways that resulted in higher predicted losses. In April 2006, for example, Risk Management Solutions increased the expected frequency of Category 3 to 5 hurricanes making landfall in the Gulf, Florida, and the Southeast by 50 percent compared to a pre-2004 historical baseline (Clark, 2008).[23]

Second, many windstorm insurers and credit rating agencies have begun to question the use of a 100-year event assumption as the benchmark for determining a "probable maximum loss" (PML).[24] A "100-year event" means that there is a 1 percent probability of the estimated event occurring in a given year. This was the most common probability standard that many insurers and risk managers used to determine their insurance and loss mitigation tactics before 2005. In more recent years, a "1 in 250 year" standard (0.4 percent event probability) has often been used. Several of the underwriters we interviewed mentioned they are also considering 500-year assumptions (0.2 percent event probability) as a new "worst case" scenario for their financial planning, reinsurance purchasing strategies, and disaster preparedness requirements.

For the coastal residential insurance marketplace, reduced expectations of the precision of model estimates and the shift to the 250-year-return assumption likely require insurers to hold more capital

[22] Representatives of these firms interviewed for this study emphasized that their software was never intended to replace the need for insurer judgment. Contributing to the uncertainty is the potential for non-stationary climate patterns induced by global warming.

[23] Each of the three leading catastrophe software firms revised their modeling assumptions in response to the major storms of 2004 and 2005. In general, each produced more cautious and conservative estimates of the near term probable average annual losses that insurers need to anticipate in their pricing models. See Clark (2008) for a review of these changes and a discussion of the limitations of predictive modeling over very short terms.

[24] The PML is the worst-case scenario used in insurer planning. It is the loss that occurs with less than a specified probability. Insurers plan to a PML rather than plan for any loss that could conceivably occur because the cost of holding sufficient capital to protect against *any* contingency would be prohibitively large.

to protect against the risk of insolvency. The consequent increase in risk load will cause premiums to diverge further from expected annual loss.[25] An increased risk load makes it even more difficult for private insurers to achieve the first goal for a well-functioning residential wind insurance market: insurance premiums should create appropriate incentives to mitigate risk.

**Regulatory Pressures: Pricing Controls and Premium Credits for Risk Reduction.** State insurance department regulators influence the willingness of private insurers to offer windstorm coverage through their authority in numerous areas. The most hotly contested area is their control over premium rates.[26] State Farm Florida's initial decision to withdraw from the Florida market, for example, was due in large part to its "inability to obtain regulatory approval of what it believes to be adequate property insurance rates" (Patel, 2009).[27] Disagreements have also emerged over how much the premium should be reduced when the homeowner invests in risk mitigation, such as "tying-down" roofing and installing more wind resistant glass or shutters. State Farm Florida's requested premium rate increase was in part a response to the Florida Department of Insurance's requirement that that premium discounts for mitigation efforts be doubled in 2007.

Assuming an insurer cannot agree to the pricing level that is approved by a given state's insurance department, it is left with five possible options (subject to regulatory limitations):

1. Decline to renew policies of existing policyholders

[25] A study by Kunreuther & Michel-Kerjan (2009, p. 296) suggests that the different return-period assumptions will have a major impact on insurer decisions. They estimate an $84 billion loss in Florida for a 100-year hurricane, a $126 billion loss for a 250-year storm, and a remarkable $160 billion loss for a 500-year storm.

[26] Regulators also influence the supply and cost of residential insurance in other ways, including the classification system to be used to distinguish risks, the competitive limitations that are placed upon the state's residual market insurer, the minimum solvency requirements, the insurer's underwriting and claims practices, the restrictions placed on the purchase of reinsurance from underwriters not "admitted" or "accredited" in the given state, and the state's process to allow an insurer to enter or exit a market. All of these factors influence the willingness of private insurers to underwrite dwellings in high-risk areas (Kleindorfer and Klein, 2002).

[27] In January 2009 the *Sun-Sentinel* reported that State Farm "blames state regulators for denying the companies' requested increases of 47 percent and 67 percent, which the company said it needs to build funds for paying hurricane claims. State Farm agreed in 2007 to lower rates by 9 percent after a 53 percent rate boost was approved in 2006" (Patel, 2009). As discussed previously, State Farm later agreed to reduce the policies it writes in the state instead of withdrawing from the market entirely.

2. Stop writing new business in the admitted market
3. Expand its new business in the largely unregulated surplus lines (or non-admitted) market that is focused on high-valued homes, a market that is not subject to pricing controls and not backed by the state guaranty fund
4. Renew admitted policies with a windstorm exclusion
5. Identify one or more insurers willing to accept the transfer of large blocks of policies.

During 2006 and 2007, several large residential insurers actively implemented several of these approaches.[28] The result can be an increased market share of state-backed insurance programs.

**Assessment and Pricing Risk from Residual Pools.** A budget shortfall run up by a state residual market can impose considerable costs on insurers doing business in the state. For example, if a large insurer writes 10 percent of the residential market in a state, and losses in a beach plan or wind pool exceed the assets of the pool, the large insurer may be responsible for 10 percent of the shortfall. Residual pools often recover shortfalls by assessing all the insurers in the state; consequently, even if an insurer avoids underwriting any policies that sustain damages from hurricanes, it can be subject to substantial assessments.[29]

Mississippi and Louisiana are cases in point. MWUA paid $750 million on 18,000 claims in 2005. This loss represented a remarkable 44 percent of the total insured values in the fund—well above the $175 million in catastrophe reinsurance that had been purchased—resulting in an industry assessment of $285 million. In one of our interviews, a residential insurer in this state with all its policies in the northern part of the state advised us that, despite this underwriting caution,

[28] One of the largest transfers from one insurer to another involved the movement of over 120,000 Allstate policies to a new, start-up residential insurer in Florida named Royal Palm. This transaction was approved by the Florida Office of Insurance Regulation and is discussed in Allstate's 2006 and 2007 SEC filings.

[29] In most cases, at least a part of the assessments can be passed through to policyholders. Insurers can also face assessment for the claim-payment obligations of insurers that become insolvent following a disaster (through assessments by state guaranty funds); however, insurers are typically allowed to pass most or all such assessments on to policyholders.

the loss assessment they were required to pay exceeded the total direct premium they wrote in 2005.[30]

LA Citizens sustained 2005 losses of almost $1 billion from some 70,000 claims related to Hurricanes Katrina and Rita. These outlays were well in excess of its available cash reserves of about $80 million. Catastrophe reinsurance paid $295 million of the state insurer's loss. The insurer financed its remaining deficit through the combination of an assessment payable by all of the state's property insurers and a tax-exempt revenue bond totaling almost $1 billion (Louisiana Citizens Property Insurance Company, 2006).[31]

The pricing practices of residual insurers can also create challenges for private insurers. Even if regulators do not limit the prices that private insurers can charge, subsidized premiums offered by the residual insurer can limit the prices private insurers are able to charge. Such price competition can reduce the willingness of private insurers to provide wind insurance.

**Contract Uncertainties.** Another factor that discourages private insurers from committing more capacity in high-risk areas is contract uncertainty. Contract uncertainty takes two forms. First and most obvious, it refers to the many hundreds or even thousands of formal disputes between policyholders and insurers that erupted shortly after the 2005 hurricane season. The two primary issues in dispute involved the applicability of the flood exclusion and the validity of the "anti-concurrent causation" limitation in most residential policy forms.[32]

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[30] Insurers in the non-admitted market are not assessable under the MWUA program, but a policy fee is charged. Also, in the event of required surcharge in the year following a major storm, non-admitted insurance policies may be subject to required surcharges. The property insurance policies it offers are limited to damages from windstorm and hail (as opposed to the optional full homeowner's policies offered by some other state facilities). See http://www.msplans.com/MWUA/Index.htm

[31] The "Official Statement" issued as a part of the bond offering stated that, after deducting expenses, unearned premium and reinsurance, the 2005 net deficit of the Plan was 953.6 million (p. 4). Available at: http://www.lacitizens.com/Static_Content/LA%20Citizens%20Assessment%20Information%20Center/Official%20Statement.pdf.

[32] The anti-concurrent causation (ACC) exclusion in the standard homeowners' policy states that loss that is excluded will not be covered "regardless of any other cause or event contributing concurrently or in any sequence to the loss. These exclusions apply whether or not the loss event results in widespread damage or affects a substantial area" (Insurance Services Office, Inc, 1999). The flood and ACC provisions have been the main focus of coverage disputes with the main questions being (1) whether and to what extent wind or flood damaged the same dwelling and (2) the timing or the sequence of damages by the insured and excluded causes of loss.

Although insurers have won the majority of the major court decision to date, litigation in Louisiana, Mississippi, and other Gulf States over these issues is ongoing, and uncertainty over what exactly the standard residential policy covers will likely continue for the foreseeable future.[33]

Even if there is clarity about what an insurance policy covers in principle, it may be difficult to implement the coverage rules in practice. For example, in October 2009, the Mississippi Supreme Court issued a landmark ruling regarding coverage and the timing of a loss. In *Corban v. USAA*, the court ruled unanimously that "The insured's right to be indemnified for a covered loss vests at the time of the loss" (¶32,p.17). In other words, if wind damages a specific part of a dwelling first (and it is covered by the insurer), and then water (or storm surge in the case of a hurricane) damages the same part of the property (and it is excluded by the flood exclusion), the court ruled that coverage must be honored. The reverse is also true. Unfortunately, in New Orleans, the unprecedented flooding resulted in long delays in claims adjusters' ability to inspect property. As a result, it was often simply not possible to determine whether or when wind or flood caused the damages at issue. In Mississippi, as we have pointed out, storm surge and high winds simply wiped out entire homes.

A second form of contract uncertainty is created by the many emergency rules and bulletins issued by state insurance departments in the immediate aftermath of a natural disaster. Insurers argue that these requirements unfairly redefine the terms of their contractual obligations and do not recognize that premiums did not account for these modifications. For example, Louisiana's Rule 16, issued on December 22, 2005, implemented a claims mediation process for all personal lines residential claims. Louisiana's Directive 195, issued in February 2006, required insurers to give residents sustaining damages from Rita or

[33] For example, in June 2009, the Louisiana Supreme Court "restarted the clock" for the filing of new claims on an individual basis, a process that had previously been part of a class action that addressed policy coverage issues (Mowbray, 2009).

Katrina an additional six months to qualify for replacement cost protection.[34]

Increased contract uncertainty and the litigation resulting from Katrina, as one insurance spokesperson told Congress in 2007, "pushed uncertainty past the tipping point" and resulted in a potentially "lethal blow" to the ability of private insurers to operate in Mississippi and Louisiana. Although these concerns moderated in 2010, the insurers we interviewed cited contract uncertainty as a strong deterrent to extending their capacity in many coastal states. In fact, many claimed this problem was at least as important a deterrent as constraints on pricing.

**Flood Risk**

Flood risk shares many of the same characteristics we've just described for wind risk. Both present the inherent risk of correlated losses from multiple insurance policies, and both are difficult to price as the frequency and severity of recent storms and floods change the magnitude of "actuarially sound" premiums. But flood risk poses even greater challenges to underwriting. After the Great Mississippi flood in 1927, which caused massive damages that were paid almost entirely by private insurers, virtually the entire private market decided that flood risks were simply too systemic and resistant to diversification to be underwritten by private insurers. As two insurance experts wrote in 1955, flood was "the only natural hazard not now insurable . . . for the simple reason that that the experience of private capital with flood insurance has been decidedly unhappy" (Moss, 2002, p.262-263). When Congress launched the NFIP in 1968, most private insurers remained out of the market.

There are two main reasons why flood risk is more difficult for the private market to insure than windstorm risk. First, only those homeowners who live in areas that are particularly prone to flooding are likely to purchase flood insurance—a problem referred to as *adverse selection*. Adverse selection makes it very difficult for insurers to diversify risk because insurers are often not able to precisely

[34] For a summary of the emergency rules and bulletins issued in response to 2005 hurricanes Katrina and Rita and a discussion of the impact on insurer claims handling, see Harbin (2006).

characterize the variation of risk from property to property. The problem is worse for flood than wind insurance because the amount of flood risk can vary a great deal over small distances (King, 2009, p. 6).

Second, flooding differs from windstorm risk in that flood damage is often made worse by the failure of man-made and typically government-funded projects. Some of the nation's worst floods were caused either by intentional acts or by acknowledged problems in the construction or maintenance of flood protection systems——what underwriters refer to as "the public sector risk."[35] According to the report by an independent task force sponsored by the Army Corps of Engineers, from 50 to 67 percent of the flood losses paid by the NFIP following Katrina resulted not from accidental flooding but from shortcomings in the design, construction, or maintenance of the levees and pumping stations (Army Corps of Engineers, 2009).

This issue does not by itself make flood risk uninsurable. After all, many forms of insurance directly or indirectly cover losses resulting from intentional or negligent human acts. What makes flooding different is the fact that the most accountable parties for the design, construction, and maintenance of hurricane protections systems have the benefit of statutory immunities. For example, the Army Corps of Engineers has had a statutory limitation on its liability since it was empowered to oversee flood control across the nation by the Flood Control Act of 1928.[36] The limited ability of an insurer to seek recourse against responsible parties presents another impediment to private sector underwriting of this risk.[37]

For these reasons and several of the reasons already discussed for wind risk, private insurers have largely avoided insuring flood risk on

[35] Two notable examples are the infamous Great Johnstown Flood in May 1889, resulting in the deaths of over 2,200 residents, and the intentional bombing of levees in Louisiana in October 1927 to divert the flood waters approaching the city (see McCullough, 1968, and Barry, 1997).

[36] The Flood Control Act of 1928 authorized the Army Corps of Engineers to oversee the development of flood protection systems along the Mississippi River and also along the Sacramento River in California. Section 3 also limited the liability of the Corps for any losses resulting from "any damage from or by floods or flood waters at any place…" Available at: http://www.mvd.usace.army.mil/mrc/history/AppendixE.htm

[37] When viewed from this perspective, the NFIP might be best understood not as a traditional form of property insurance but rather as a uniquely broad and responsive form of warranty insurance. In many claims situations, insurance from the NFIP is, de facto, a form of no-fault or faulty workmanship insurance.

single-family homes. There are two exceptions to this rule: (1) temporary coverage issued by banks to comply with the mandatory purchase requirements (MPR) of the NFIP and (2) coverage for high-end homes, normally in excess of the NFIP limits.[38] Regarding the first exception, a report by Dixon, Clancy, Bender, et al. (2007) on this lender-placed marketplace estimated that approximately 180,000 to 260,000 residences in the United States were covered by some form of private, lender-placed flood insurance as of the mid-2000s.[39] Regarding the second, a small number of private insurers have been underwriting flood risk for high-valued homes (Silverman, 2005) both before and after Katrina. Based on our recent interviews, almost all of this insurance is placed in the surplus lines market and, as such, is not subject to price controls. Deductibles in some states can also range up to 25 percent on houses with values well above $1 million. Thus, at least for some higher-income residents, the private insurance market has developed a possible alternative or supplement to the limited coverage provided by the NFIP (currently subject to a maximum dwelling limit of $250,000 with no "loss of use" or additional living expense protection).

Despite these inroads, our analysis highlights many impediments to expanding private insurance for flood risk in the traditional insurance market along the Gulf coast. Unless these issues are addressed in future reforms, it is unlikely that private insurers will be able to play a more significant role in this market.

**CHALLENGES FACING THE PUBLIC SECTOR**

In principle, the government has an advantage over the private sector in providing wind and flood insurance because it does not have to charge a large risk premium over expected losses.[40] It can increase tax

[38] The MPR requires flood insurance on the home structure equal to the least of (1) $250,000 (the NFIP maximum for structure coverage), (2) the unpaid mortgage balance, and (3) the replacement value of the home (Dixon, Clancy, Bender, et al., 2007, p. 23).

[39] The number of private policies was still not large compared with the approximately 5 million NFIP policies that were in place at the time (Dixon, Clancy, Bender, et al., 2007, pp. xiv-xv).

[40] The argument is not that government's cost of capital is lower that the private sector's, but rather that it does not have to hold the capital private insurers set aside to avoid insolvency. The government faces the same timing risk as the private sector, but it can borrow funds to cover large losses that occur before sufficient premiums have been collected. Over the long run, interest earned on premiums that build up between large catastrophic events will largely offset borrowing costs.

revenues to cover losses after a major wind or flood event and thus does not need to be concerned about insolvency. Government programs consequently can charge premiums close to expected losses, providing the appropriate incentives for risk mitigation and economic development. The extent of the public sector's advantage over the private sector depends on the magnitude of the risk loads required by private insurers and reinsurers.

The main concern with government programs is their tendency to subsidize premiums in high-risk areas by charging less than actuarially needed rates.[41] The subsidies are the result of strong political pressures to set premiums below expected losses. Local communities, for example, often want low insurance rates to encourage development and to grow the tax base. Subsidies in the NFIP are substantial. Congress authorized subsidies for certain types of properties when it passed the NFIP in 1968, in part to encourage communities to adopt floodplain management practices. According to a recent study by the Congressional Budget Office, these subsidies apply to about 20 percent of the properties currently insured by the NFIP and cost the program $1.3 billion a year (CBO, 2009b, pp. 3, 6).[42] Had the program charged full premiums and been allowed by Congress to build up a reserve, the NFIP would likely have needed considerably less than the $20 billion it borrowed from the Treasury following Hurricanes Katrina and Rita.

As discussed above, many state insurance pools have also run large deficits, necessitating assessments on policyholders and taxpayers who often do not live in high-risk areas. MWUA has also used federal funds to subsidize its rates.

It should be noted that subsidies in public wind programs do not necessarily mean that the premiums charged by the wind programs are below expected annual losses. These programs are often backed by reinsurance that is purchased in the private market, and as argued above, the cost of this reinsurance may be several multiples of expected losses. More research is needed to better understand the prevalence of

[41] The subsidies can be funded by taxpayers or by setting premiums in low-risk areas that are higher than actuarially justified.

[42] According to one study, "roughly 122,000 of 200,000 damage claims from Hurricane Katrina (as reported to FEMA by November 30, 2005), or 61 percent, were for subsidized properties" (Marron, 2006). This estimate is based on a review of "partial data" from the hurricane.

cases in which subsidies only partially offset reinsurance costs that are above expected losses as compared to cases that result in premiums that are below expected losses.

In any case, subsidies entail transfers from one group of policyholders or taxpayers to other policyholders that benefit from the subsidies. The result may be premiums for policyholders in low-risk areas that are inappropriately high or subsidies from taxpayers in low-risk areas to policyholders in high-risk areas.

**CHALLENGES CREATED BY HOMEOWNERS**

Setting premiums close to expected losses will not do much good if residents do not take expected loss into account when deciding where to live or how much to spend on mitigation measures. Many residents do not take such costs into account. Research has shown that when the probability of an event is below a certain level, individuals tend to ignore the risk (The Wharton Risk Center, 2007, p. 73). Flood and wind risk may fall into this category because major events in a particular location can be many years apart. Homeowners may also decide against insurance because they expect assistance from the government or charities following a major event.

Contributing to these problems are flood-risk maps that are out of date. FEMA produces flood maps for communities across the nation and has a map modernization program underway. However, as of April 2008, 50 percent of the nations flood maps were over 15 years old (GAO, 2009b, p. 18). Increased development, natural changes in the environment, and revised data may mean that many maps do not accurately reflect flood risk. Many of those interviewed cited out-of-date flood maps as contributing to homeowner perception that flood risks were low.

Failure to appreciate the cost of flood and wind risk contributes to perceptions that the cost of wind or flood insurance is “too high” or “unaffordable.” It can also mean that residents are not willing to buy insurance at premiums that reflect expected loss, resulting in low take-up rates. Subsidized premiums contribute to the problem by perpetuating the expectation of low rates. As an illustration of the challenges presented by the demand side of the market, consider the NFIP. Research has shown that compliance with the program’s mandatory purchase

requirement (MPR) is fairly high. Dixon, Clancy, et al. find that 80 to 90 percent of homeowners in the South who are subject to MPR indeed do purchase flood insurance. In contrast, their analysis suggests that only 20 percent of households that are in high-risk flood areas but not subject to the MPR purchase flood insurance (2006, p. xiv).[43] Because this kind of research has not been conducted on wind insurance, we cannot determine the share of homes in the Gulf States that do not currently have wind insurance.

## POLICY IMPLICATIONS

We have identified serious, ongoing problems facing the Gulf coast residential insurance market. We also have defined numerous impediments limiting the ability of the private and public sectors to resolve these problems. In this section, we explore the policy implications of our findings. We return to the goals proposed for an effective residential insurance market and highlight policy reforms that warrant consideration for achieving each of these goals. We discuss the advantages and disadvantages of different approaches and provide a framework for assessing the tradeoffs that policymakers will need to make in deciding how to precede.

### Goal 1: Insurance Premiums Should Create Appropriate Incentives to Mitigate Risk

An important barrier to setting wind insurance premiums that approximate expected loss is the substantial risk load that can be required by the private sector when underwriting wind or flood insurance. There are essentially three approaches to overcoming this barrier, which we describe below in order of increasing government involvement:

- **Changes in government regulations that reduce the cost of the capital private insurers hold to protect against large losses.** The United States might follow Europe's lead and allow private insurers to set aside loss reserves on a pre-

[43] Michel-Kerjan and Kousky also find evidence consistent with substantial cycling of properties in and out of the NFIP. They find that 62 percent of Florida policies in place in 2000 were no longer in place five years later, and attribute only 1 to 1.5 percent of the annual decline to home sales (2010, p. 379).

tax basis before a catastrophe occurs. Doing so would reduce the cost of holding the capital needed to protect against the risk that losses far exceed expected values. Post-event loans to insurers are also are worthy of consideration. Insurers could use such loans to fund claims payments after very large events, reducing the need to hold large amounts of capital.[44]

- **Government provision of reinsurance for wind risk.** Because it does not face the same solvency concerns as the private sector or state and local governments, the federal government could offer reinsurance at premiums that reflect the expected value of the loss. The availability of such lower-cost reinsurance would allow private insurers to hold less capital and to lower their risk loads. Similarly, the availability of such reinsurance would allow state wind pools to set premiums closer to expected losses.[45]
- **Government provision of wind insurance.** The most aggressive government approach to reducing risk loads is for the government to provide wind insurance much as it currently does for flood insurance. Proposals have been made to expand the NFIP to include wind insurance.[46] The federal program could then, in principle, set rates to reflect expected losses.

Each of these options has advantages and disadvantages. The first option emphasizes the role of the private sector, but it is not clear

[44] Jaffee and Russell have discussed providing liquidity to insurers after major disasters, which may also be an effective way to reduce insurer capital costs (2006, pp. 4-5). In addition, government promotion of alternatives to traditional reinsurance such as catastrophe bonds and other capital market solutions should also be considered.

[45] This approach is taken in part by a proposal supported by several large insurers including Allstate, the Hartford, Nationwide, and Travelers. The proposal includes a first tier of protection from traditional insurers and reinsurers, a second tier from state catastrophe reinsurance funds similar to the Florida Hurricane Catastrophe Fund, and a third tier from the federal government that would either act as a reinsurer or lender in the event of a major catastrophe (ProtectingAmerica.org, 2009). Legislation to implement this proposal (HR 2555) makes it clear that the program should be self-funded.

[46] See legislation sponsored by Congressman Taylor called the "The Multiple Peril Insurance Act" (HR 1264), http://www.taylor.house.gov/images/stories/insurance_reform/insurance_pdfs/hr1264.pdf.

how far such reforms would go in reducing risk loads.[47] The second and third options could be effective in substantially eliminating the risk load, with the magnitude of the reduction depending on the risk loads required by private insurers and reinsurers. On the downside, the second and third options could both result in subsidized rates. We have seen the trouble caused by subsidies in the NFIP, and the prospect of offering federal insurance that covers multiple perils offers a new source of concern: pricing schedules that create cross-subsidies between wind and flood risk.[48]

The second and third options emphasize a federal role. Options that consider state-level action should also be considered. For example, a regional authority that was able to provide reinsurance and issue bonds might be workable; however, the size required for such an organization to be successful would need to be examined, and it may be easier to take advantage of the federal framework and institutions already available.

Another policy implication of our analysis is that the goal of setting premiums to create the proper incentives would be better served if the subsidies in the NFIP program were phased out. Such a step would enable NFIP rates to better approximate expected losses and thus send more appropriate incentives for risk management. In deciding how to best eliminate these subsidies, policymakers need to consider the effects of higher prices on take-up rates and the impact of increased rates on lower-income households.[49]

**Goal 2: Decisions by Households and Residential Developers Should Factor in Wind and Flood Risk**

A serious shortcoming of the NFIP in terms of ensuring that expected flood losses are factored into household and developer decision-making is low take-up rates in high-risk areas when the purchase of flood insurance is voluntary. Policymakers should consider

[47] See Smetters and Torregrosa for further discussion of the advantages and disadvantages of various tax reform options (2008, p. 19).

[48] See PCI (2010) for short descriptions of the pros and cons of these and other proposals.

[49] Proposals along these lines are currently being considered. For example, H.R. 5114, which was recently passed by the House, slowly phases out subsidies for homes that are not the primary residence of either the owner or a tenant (vacation homes) (U.S. House of Representatives, 2010).

expanding the mandatory purchase requirement of the NFIP to include all homes in Special Flood Hazard Areas, regardless of whether they have a mortgage. Policymakers should also consider increasing the coverage requirements of the MPR to equal the structure value as opposed to the outstanding balance of the loan. Doing so would help ensure that developers and the approximately one-third of homeowners without mortgages assume responsibility for the cost of flood risk. Expanding mandatory purchase requirements would also reduce adverse selection, which is one of the reasons that the private sector is reluctant to underwrite flood insurance.[50]

Similar policies should be considered for wind insurance. If future research finds that a large share of homes in the Gulf States do not currently have wind insurance, then a mandatory purchase requirement for wind insurance should be considered in areas of substantial wind risk.

Mandatory purchase requirements raise concerns about the effect of such requirements on lower-income homeowners or renters whose rent includes the cost of insurance. As a result, there may be calls to provide assistance to low-income homeowners or renters to offset the costs of insurance. If policymakers want to move in this direction, it is important they the consider policies that are not tied directly to the purchase of insurance. The problem with linking assistance to insurance——by offering vouchers or tax-deductible insurance premiums, for example——is that the homeowner no longer faces the full costs of wind or flood risk. A more effective approach would be income tax reductions for low-income residents or other benefits not tied to the purchase of insurance. Mandatory purchase requirements would still be essential to ensure that low-income residents purchase insurance if they live in high-risk areas, rather than spend the benefits in other ways.

[50] Researchers at the Wharton School have proposed a “long term insurance policy” of ten years or more that would essentially become attached to the dwelling it insures (Kunreuther and Michel-Kerjan, 2009, pp. 338-343). Such a policy may reduce cycling of properties in and out of the NFIP and may reduce the reluctance of many homeowners to invest up front in costly risk mitigation measures. We also note that several states (including Mississippi, South Carolina, and Texas) require certain types of dwellings in high-risk areas to purchase NFIP coverage in order to be eligible for wind-pool insurance. Such requirements broaden the take-up of flood insurance.

**Goal 3: The Insurance System Should Pay Legitimate Claims Efficiently and Expeditiously**

Coverage disputes between policyholders and insurers are a major obstacle to the efficient and expeditious payment of claims. Three types of reforms would reduce the waste and delays caused by contract disputes, described below in order of increasing government intervention.

- **New Policy Language on Loss Allocation.** Regulators might require wind and flood policies to include language that addresses how losses would be allocated when they are jointly caused by wind and flood or when the cause or timing of damage cannot be determined.[51] The National Association of Insurance Commissioners (NAIC) could convene a panel of representatives from the NFIP, private insurers, and state insurance regulators to develop model language. For example, in the event of a loss that included both wind and flood damages, the policy might specify that damages would be split evenly between the wind and flood policies when the cause or timing of damage cannot be determined. State insurance regulators could then require the language to be included in the policies issued in their states. In addition, regulators and insurers could consider adding a binding mediation or arbitration clause in the event of a disagreement over whether a loss was "total" or involved both an excluded and included cause of loss.[52] This approach is common in some specialty lines of insurance.
- **Public Reinsurance for a Wind and Flood Policy.** One possible solution to the coverage disputes that plague wind and flood insurance is a policy that covers damage from both windstorm and flood and only requires the policyholder to pay one

[51] This type of approach has been advocated by South Carolina Insurance Commissioner Scott Richardson (Richardson, undated), and has been used effectively in the past to address situations in which losses are partly insured and partly excluded (such the legal costs incurred to defend policyholders under directors' and officers' liability policies in the 1990s).

[52] Senator Wicker of Mississippi has introduced legislation that would establish an arbitration process to resolves disputes between FEMA and insurers over the allocation of losses to wind and flood policies (United States Senate, S. 3672, 2010).

deductible, regardless of the cause of loss.[53] To encourage private participation in such a policy, a federal reinsurance program for both wind and flood losses warrants consideration. A private wind and flood policy would cover a first tier of wind and flood losses with additional insurer payments being reimbursed by the federal program. Any federal reinsurance program should charge actuarially sound rates that reflect the combined wind and flood losses of the insured properties.[54]

- **Public Wind and Flood Policy.** In addition to reducing the risk loads required by private wind insurers, expanding the NFIP to cover wind insurance would also solve the problem of coverage disputes. As mentioned in the discussion of options to address Goal 1, Congressional legislation has been introduced to this effect.

How effective the first option would be in reducing coverage disputes is uncertain. As long as the entity bearing the risk for flood is different from the entity bearing the risk for wind, there will always be the potential for disputes. For example, policy language may say that losses would be evenly split when the cause or timing of damage cannot be determined, but disputes will likely arise over whether the cause or timing of damage can be determined. Nevertheless, it seems sensible to explore the potential payoff of convening a panel to develop policy language to allocate losses due to wind and flood.

The second and third approaches would address the coverage litigation problem. The second option could encourage the private sector to resume providing wind coverage for many homes in the Gulf coast region and to start picking up a substantial part the flood risk.

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[53] This policy would not cover other perils such as fire and theft. A somewhat narrower wind and flood policy might only cover flood losses due to direct storm surge (as opposed to all flood losses) is also worthy of consideration.

[54] One of the nations' largest homeowner insurers, Nationwide Mutual, has proposed a similar idea. In mid-2008, it stated that it was willing to expand its standard homeowners' policies along the coast to include flood damages from named storms or hurricanes. However, the precondition for this would be some exemption from state pricing controls and a reinsurance relationship with the NFIP. According to a spokesman for the insurer, "We see this [plan] as a viable alternative to much of the litigation that occurred post-Katrina. No one, whether it is insurers or consumers, benefits from litigation" (Kunzelman, 2008).

However, the reinsurance offered by the federal government in the second option would need to be sufficiently attractive to overcome the private sector's resistance to offering flood insurance. Again, political pressure to subsidize rates or to cross-subsidize wind and flood rates is a potential disadvantage to both the second and third options.

**Goal 4: The Market Should Encourage Innovation and Price Competition**

Policymakers should be wary of a market in which the government is sole provider of wind or flood insurance because the absence of competition can retard innovation and foster inefficiency. To encourage a healthy and vibrant market, policymakers should consider reforms that increase the willingness of the private sector to offer wind and flood insurance. Areas of concern for private insurers continue are price regulation that is perceived to be unfair, contract uncertainty in the form of post-event reinterpretations of policy language, emergency rules issued by state regulators, litigation risk, and assessments by state-run insurance programs to fund deficits.[55]

Most of the impediments to increased private-sector involvement are generated at the state level, and federal regulation of wind and privately provided flood insurance warrants consideration.[56] Such a federal regulator would oversee pricing, policy terms, and any changes to those terms.[57] While in principle a federal regulator can adopt policies that are just as unattractive to private insurers as state regulators, it may not be subject to the same intense local political pressure imposed on state regulators following a disaster.

[55] We note that several other proposals at a state or federal level have focused on creating some preemption of state pricing controls in high-risk coastal regions. The regional "coastal zone" proposal of the Travelers (Fishman, 2007) appears to be the most notable, with considerable support among the stakeholders we interviewed.

[56] For example, in late June 2009, Florida's Governor Crist vetoed HB 1171 which would have deregulated residential insurance pricing. The Governor said that bill would give large insurers the ability to "cherry pick" the most profitable homeowners policies and leave the most risk to the state's Citizens Insurance Company and to smaller insurers (Kaczor, 2008).

[57] For example the Traveler's proposal would create a federal board to oversee the regulation of primary windstorm insurance in four coastal or low-lying zones from Texas to Maine. Under this proposal, the federal government "would not have a financial role, but would regulate and oversee most aspects of wind underwriting by private insurers, including pricing" (Fishman, 2007).

**Making Tradeoffs Among Goals**

We have identified reforms that merit consideration for furthering each of the different goals for a well-functioning wind insurance market (see Table 4 for a list of reform options). It is also important, of course, to assess the ramifications of each option on each the other goals. For example, government provision of wind insurance (the third option that addresses Goal 1) can result in premiums that more closely reflect expected losses because private risk loads would no longer be required. However, this goal may not be attainable if political pressures to subsidize rates prevail. Also, unless public wind insurance is intentionally priced above actuarially based rates (like many state competitive workers compensation funds), public provision of insurance could reduce competition in the market.

**Table 4: System Goals and Reform Options that Address Them**

| Goal | Options that Address the Goal |
|---|---|
| 1. Insurance premiums should create appropriate incentives to mitigate risk | Changes in government regulations that reduce the cost of the capital private insurers hold to protect against large losses |
| | Government provision of reinsurance for wind risk |
| | Government provision of wind insurance |
| | Phase out of NFIP subsidies |
| 2. Decisions by households and residential developers should factor in wind and flood risk | Expansion of mandatory purchase requirements |
| | Assistance to low income homeowners and renters to off-set the costs of insurance |
| 3. The insurance system should legitimate pay claims efficiently and expeditiously | New policy language on loss allocation |
| | Public reinsurance for a wind and flood policy |
| | Public wind and flood policy |
| 4. The market should encourage innovation and price competition | Federal regulation of wind and flood insurance |

In developing a comprehensive national plan for residential insurance, policymakers will need to select a package of options that provides the most attractive overall outcomes. Doing so will require

comparative assessments as well as judgments about the relative importance of different goals. For example, if private-sector competition is judged to be critical to a well-functioning insurance market, then options such as expanding the NFIP to provide wind insurance would be less attractive. To facilitate this process, we endorse the formation of a national commission to assess the feasibility and desirability of the options proposed here as well as others suggested by legislators, insurers, policy analysts, and other interest groups.[58]

**CONCLUSION**

Returning to the question that opened the paper, we as a society have learned a great deal in the five years that have passed since Hurricane Katrina. We have learned that the current constellation of institutions and regulations is not well suited to achieving the basic goals for a well-functioning insurance market. We have learned that many regulations and tax provisions make it difficult for the private-sector to create a well-functioning insurance market on its own. We have also come to better understand the inherent limitations of the private sector in insuring wind and flood risk. The experience over the last five years has also underlined vulnerabilities of public sector response to fill gaps left by the private sector.

While the current system is loudly criticized by interest groups on all sides of the market, there appears to be little agreement on effective solutions. New policies are urgently needed to create appropriate incentives to mitigate flood and windstorm risk and ensure that a compensation system is in place for the devastation that will eventually occur. Given the many states that face wind and flood risks along their coasts and the exposure post-disaster assistance carries for federal taxpayers, we believe that federal leadership is critical to moving forward. Initial steps along this path, such as a national commission to assess reforms, should be taken immediately.

[58] The Commission might be modeled after one proposed in the 110th Congress. The Commission on Catastrophic Disaster Risk and Management Act of 2007 would have set up a commission to evaluate various proposals for reform and to submit a report to the President and Congress with findings and recommendations for legislation or administrative action (U.S. Senate, 2007). The legislation was endorsed by the NAIC, but was not passed. Such a commission could alternatively be convened by FEMA or the Department of Homeland Security.

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