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## IMPLEMENTING THE NATIONAL FLOOD INSURANCE REFORM ACT IN A NEW ERA OF CATASTROPHES

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Many communities in the U.S. have suffered recently from a series of disasters that have caused extensive damage and have been extremely costly. Following these catastrophes, insurance payments were historically high, as was the relief provided by the national government to state and municipal governments in affected areas.<sup>1</sup> The 2005 and 2012 hurricane seasons taken together cost taxpayers nearly \$150 billion—about a third of which was from losses due to Hurricane Sandy that occurred a year ago this October. These facts raise two broad questions for the nation to consider:

*What steps can be taken to reduce damage from future disasters so that communities are more resilient with respect to these events?*

*Who should pay for mitigating losses from future disasters and the economic impacts triggered by these catastrophes?*

Answering these questions is now

urgent. The empirical and scientific evidence on the increased losses from natural catastrophes and more extreme weather trends suggests that the worst is yet to come. The National Flood Insurance Reform Act (NFIRA) of 2012 (also known as the Biggert-Waters Act), passed three months before Hurricane Sandy, offers an opportunity to address how we can reduce future losses while providing better financial protection to disaster victims. But there are challenges in getting individuals to voluntarily purchase insurance coverage before a disaster. And affordability issues, which are now part of a national public policy debate, threaten to delay the implementation of key features of this legislation.<sup>2</sup> This Issue Brief addresses the important role that NFIRA can play in establishing a financially sound system for disaster insurance, and proposes concrete ways to overcome the challenges to its prompt implementation.

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Erwann O. Michel-Kerjan is an authority on managing the risks, the financial impact and the public policy challenges associated with catastrophic events. He was honored by the World Economic Forum (Davos) as a Young Global Leader, a nomination recognizing the most extraordinary leaders of the world under the age of 40. Author of over 100 publications he received the prestigious Kulp-Wright book award for the most influential contribution to risk management (*At War with the Weather*, with H. Kunreuther). Michel-Kerjan currently leads Wharton's flood resilience initiative. Kunreuther and Michel-Kerjan have worked closely with Congress on the passage of the Biggert-Waters Act.

## A NEW ERA OF CATASTROPHES

Worldwide, economic losses from natural catastrophes increased from \$528 billion in the decade 1981-1990, to \$1,197 billion during 1991-2000, and \$1,213 billion during 2001-2010. In 2011 alone, economic losses amounted to over \$400 billion, in large part due to the March 2011 Japan earthquake and resulting tsunami; 2012 brought another \$170 billion in economic losses.<sup>3</sup> Turning closer to home, Hurricane Katrina led to economic losses in the range of \$150 to \$200 billion—an historic record in the United States for a natural disaster. Hurricane Sandy caused an estimated \$68 billion in direct economic losses to residences, business owners, and infrastructure owners in the continental U.S.<sup>4</sup> It is the second most costly natural disaster in the United States after Hurricane Katrina.

Insured losses have dramatically increased as well. Between 1970 and the mid-1980s, annual insured losses from natural disasters worldwide (including forest fires) were only in the \$3 billion to \$4 billion range. Hurricane Hugo, which made landfall in Charleston, South Carolina, on September 22, 1989, was the first natural disaster in the United States to inflict more than \$1 billion of insured losses, with insured losses of \$4.2 billion (1989 prices). During the period 2001 to 2010, insured losses from weather-related disasters alone averaged \$30 billion annually.<sup>5</sup> A radical change!

Table 1 ranks the 25 most costly insured catastrophes that occurred from 1970-2012. With the exception of the 9/11 terrorist attacks, all of the events were natural disasters. The majority of these catastrophes caused massive damage in the United States, with eighteen of the twenty-five occurring since 2001.

The rising costs of disasters in recent years are due primarily to the high concentration of value at risk in increasingly urbanized, hazard-prone coastal areas, plus the

**TABLE 1: THE 25 MOST COSTLY INSURED CATASTROPHES IN THE WORLD, 1970-2012**

\$ BILLION	EVENT	VICTIMS (DEAD AND MISSING)	YEAR	AREA OF PRIMARY DAMAGE
76.3*	Hurricane Katrina; floods	1,836	<b>2005</b>	USA, Gulf of Mexico
39	9/11 terrorist attacks	3,025	<b>2001</b>	USA
35.7	Earthquake (M 9.0) and tsunami	19,135	<b>2011</b>	Japan
35.0*	Hurricane Sandy; floods	237	<b>2012</b>	USA
26.2	Hurricane Andrew	43	1992	USA, Bahamas
21.7	Northridge Earthquake (M 6.6)	61	1994	USA
21.6	Hurricane Ike; floods	136	<b>2008</b>	USA, Caribbean
15.7	Hurricane Ivan	124	<b>2004</b>	USA, Caribbean
15.3	Floods; heavy monsoon rains	815	<b>2011</b>	Thailand
15.3	Earthquake (M 6.3); aftershocks	181	<b>2011</b>	New Zealand
14.7	Hurricane Wilma; floods	35	<b>2005</b>	USA, Gulf of Mexico
11.9	Hurricane Rita	34	<b>2005</b>	USA, Gulf of Mexico, et al.
11.0	Drought in the Corn Belt	123	<b>2012</b>	USA
9.8	Hurricane Charley	24	<b>2004</b>	USA, Caribbean, et al.
9.5	Typhoon Mireille	51	1991	Japan
8.5	Hurricane Hugo	71	1989	Puerto Rico, USA, et al.
8.4	Earthquake (M 8.8); tsunami	562	<b>2010</b>	Chile
8.2	Winter Storm Daria	95	1990	France, UK, et al.
8.0	Winter Storm Lothar	110	1999	France, Switzerland, et al.
7.4	Storms; over 350 tornadoes	350	<b>2011</b>	USA (Alabama et al)
7.2	Major tornado outbreak	155	<b>2011</b>	USA (Missouri et al)
6.7	Winter Storm Kyrill	54	<b>2007</b>	Germany, UK, NL, France
6.2	Storms and floods	22	1987	France, UK, et al.
6.2	Hurricane Frances	38	<b>2004</b>	USA, Bahamas
6.0	Hurricane Irene	55	<b>2011</b>	USA, Caribbean

\*Including payment by the U.S. National Flood Insurance Program.

Sources: Authors' calculation. Data from Swiss Re and Insurance Information Institute (in 2012 prices). Note: Years from 2001-2012 are in bold.

relatively high degree of insurance penetration within the U.S. market, compared to less developed countries.

As of the end of 2012, there was \$35 trillion of insured exposure in the coastal states from Texas to Maine. Almost half of this property value at risk was concentrated

in three states subject to hurricanes and flooding: New York (\$7 trillion), Texas (\$5.4 trillion), and Florida (\$4.2 trillion). Consider Florida: its population increased from 2.8 million in 1950 to 19.3 million in 2010—nearly 600%. Counties along the coast had \$15 trillion of insured value at risk (see Fig-

<sup>1</sup> Michel-Kerjan, E. and H. Kunreuther (2012). "Paying for Future Catastrophes." New York Times Sunday Review. November 24.

<sup>2</sup> Siobhan H. (2013). Flood Insurance Prices Surge. Law Passed by Congress Before Sandy is Causing Sticker Shock—and a Backlash. Wall Street Journal, August 12. Pinter, N. (2013). The New Flood Insurance Disaster. New

York Times. August 23.

<sup>3</sup> Munich Re (2013). Topics geo. Natural catastrophes 2012, Report, Munich: Munich Re.

<sup>4</sup> Aon Benfield (2013). Annual Global Climate and Catastrophe Report: 2012. Chicago, IL: Aon Benfield Impact Forecasting.

<sup>5</sup> Swiss Re (2011). sigma No 1/2011: Natural catastrophes

and man-made disasters in 2010.

<sup>6</sup> Intergovernmental Panel on Climate Change (IPCC) (2011). "Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX)" <http://ipcc-wg2.gov/SREX/report/>

<sup>7</sup> Tebaldi, C., Strauss, B. H., & Zervas, C. E. (2012). "Modelling Sea Level Rise Impacts on Storm Surges along US

Coasts." Environmental Research Letters, 7(1), 014032.

<sup>8</sup> Kunreuther, H., and E. Michel-Kerjan. (2011). At War with the Weather. Cambridge, MA: MIT Press.

<sup>9</sup> Ibid.

<sup>10</sup> Perry, C. A. (2000). "Significant Floods in the United States During the 20th Century—USGS Measures a Century of Floods: USGS Fact Sheet 024-00". Lawrence,

ure 1). If appropriate adaptation measures are not adopted in these areas, future hurricanes and floods are likely to replace Katrina and Sandy in the rankings of the most costly insured losses in the coming years.

coasts, with a greater likelihood of damage to residences, commercial and industrial buildings, and public infrastructure—a trend that raises issues about the insurability of weather-related catastrophes.

lion of insured property will be destroyed by hurricanes somewhere in Florida next year.<sup>8</sup> This is equivalent to the chance of getting the number 3 in one toss of a die—hardly a low probability.

If we extend the time horizon from one year to 10 years while keeping the population of Florida constant, the likelihood of at least one hurricane causing damage exceeding this amount is greater than 5 in 6—the much higher probability of not getting the number 3 in one toss of a die. With economic development in coastal areas of this state and the apparent increased intensity of hurricanes, we are almost certain to experience a disaster of losses exceeding \$10 billion in Florida in the next decade.<sup>9</sup>

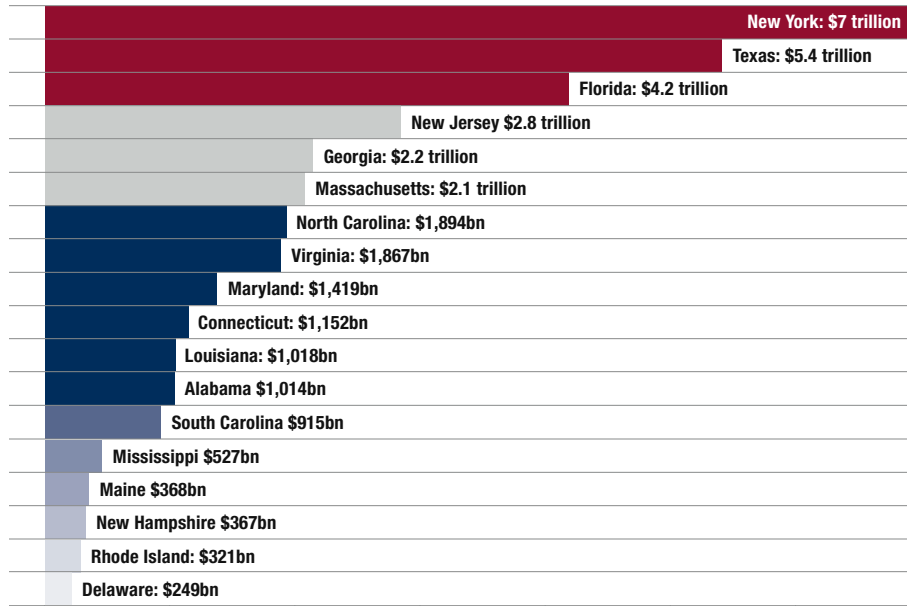
Conventional wisdom holds that major accidents and disasters are low-probability events. We often think, “It’s not going to happen to us.” But when you are the Governor of a state or a Congressional legislator, there is ample reason to worry that such events actually have a relatively high likelihood of occurring in an area over which you have responsibility.

## A FOCUS ON FLOOD HAZARD AND THE NATIONAL FLOOD INSURANCE PROGRAM

In the United States, floods have been responsible for the largest number of lives lost and the most damage over the last century when compared with other natural disasters.<sup>10</sup> Over the period 1960–2010, they accounted for nearly two-thirds of presidential disaster declarations.<sup>11</sup> Given the projections of sea level rise from climate change, one can expect a more pronounced increase in flood losses in the coming years, unless steps are taken now to adapt to this changing environment.

Floods are also the one natural disaster where the federal government currently plays a major role in designing and implementing strategies for reducing future losses and aiding financial recovery through the

**FIGURE 1: INSURED PROPERTY VALUES IN COASTAL STATES**



Source: Data from Clark and Co.

## IMPACT OF CLIMATE CHANGE

There have also been numerous scientific debates as to whether the series of hurricanes that occurred in 2004, 2005, 2008, and then again in 2011 and 2012 might be partially attributable to the impact of a change in climate. One of the expected effects of global warming is an increase in hurricane intensity, storm surge and heavy precipitation. This increase has been predicted by theory and modeling, and substantiated by empirical data. Higher ocean temperatures lead to an exponentially higher evaporation rate in the atmosphere, which increases the intensity of cyclones and precipitation.<sup>6</sup> An increase in the number of major hurricanes over a shorter period of time is likely to translate into a greater number hitting the

Climate scientists are in general agreement that global warming will increase sea level rise (SLR). A recent study analyzed 55 nationally distributed tidal gauges across the United States and developed SLR projections at each gauge location. The data indicate that sea level will rise by a foot by 2050 in most of these locations.<sup>7</sup> High water levels that have a 1 in 100 chance of occurring in 2013 will be ten times more likely to occur in 2050—that is, with a 1 in 10 chance. This is only 37 years away, so it raises a concern not only for ourselves, but for our children and grandchildren.

One need not look even that far into the future to see potentially grave losses looming. It may be surprising to learn that the probability is 1 in 6 that at least \$10 bil-

Kansas, U.S. Geological Society;

<sup>11</sup> Michel-Kerjan, E. and H. Kunreuther (2011). “Reforming Flood Insurance.” *Science* 333, July 22.

<sup>12</sup> Michel-Kerjan, E. (2010). “Catastrophe Economics: The U.S. National Flood Insurance Program.” *Journal of Economic Perspectives* 24(4): 165–86; Michel-Kerjan, E. and H. Kunreuther (2011). “Reforming Flood Insurance.”

*Science* 333, July 22.

<sup>13</sup> There is a small private insurance market for residential insurance but traditionally above the \$250,000 limit of the NFIP or forceplaced policies. The private insurance industry provides flood insurance to large commercial firms.

<sup>14</sup> Tobin, R. and C. Calfee (2005). “The National Flood Insur-

ance Program’s Mandatory Purchase Requirement: Policies, Processes, and Stakeholders.” American Institutes for Research, Washington, DC.

<sup>15</sup> Bayot J. (2005). “Payouts hinge on the cause of damage.” *New York Times*, August 31.

<sup>16</sup> City of New York. (2013). *A Stronger, More Resilient New York*. New York City, PlaNYC. Quote taken from Chapter

5, p. 97.

<sup>17</sup> Michel-Kerjan, Erwann, Sabine Lemoyne de Forges, and Howard Kunreuther (2012). *Policy Tenure under the U.S. National Flood Insurance Program (NFIP)*. Risk Analysis, 32(4): 644–658.

<sup>18</sup> Data of Table 2 (except for Sandy) come from Michel-Kerjan, E. and J. Volkman-Wise (2012). “The Risk of

National Flood Insurance Program (NFIP). The lessons for managing the flood risk discussed here thus offer guidelines for the roles that key interested parties can play with respect to preparedness and financing for not only natural disasters (floods, hurricanes, tornados, hail, earthquakes, droughts), but also other extreme events (terrorism, pandemics, technological catastrophes, financial crises).

In July 2012 the President signed the National Flood Insurance Reform Act (NFIRA)—a significant piece of legislation designed to provide more accurate information on the nature of flood risk by improving the quality of publically available flood maps across the nation. It also phases in *risk-based premiums* for policyholders with second homes or homes subject to repetitive flooding. The transition period is 5 years for homeowners currently benefiting from subsidized flood insurance rates. The change in premiums is scheduled to begin this month but there are activities in Congress designed to delay its implementation for one year, due to concerns that residents may not be able to afford the risk-based premiums. But as we know from past history: *Nothing is more permanent than the temporary.*

The Wharton Risk Center has done a considerable amount of spadework with Congressional staffers on both sides of the aisle and the Obama Administration prior to the passage of NFIRA.<sup>12</sup> We continue to do so today.

In the concluding section we propose concrete ways to address the affordability issue that is now at the center of a national debate so the reform can be implemented as planned and insurance can play its appropriate role: signaling the flood risk that residents face through risk-based premiums and providing extended financial protection to those at risk. Risk-based pricing will also reward homeowners who undertake mitigation measures by reducing their premiums to reflect their lower expected damage, and hence lower expected claims payments, from

future disasters. By contrast, if insurance remains highly subsidized, then there is no economic rationale for the NFIP to reduce premiums if a homeowner undertakes loss reduction measures.

To appreciate the nature of our proposal, it is useful to briefly describe the current structure of the NFIP. This federal program was created in 1968 in response to a series of devastating floods in the 1950s and 1960s that triggered significant government disaster assistance because private insurers were not providing coverage for water-related damage to homes and small businesses. The program, managed by the Federal Emergency Management Agency (FEMA), is designed as a partnership between the federal government and local communities. More specifically, communities can voluntarily join the program by adopting a floodplain ordinance that requires any new development and substantially improved or reconstructed properties to be built at or above the level of the 100-year flood (i.e., a flood with a 1% annual chance of occurrence). Only then can residents and small businesses purchase flood insurance. Today, 20,000 communities participate; the program provides coverage for 5.3 million policies representing \$1.3 trillion of insured exposure to flooding across the nation. Insurance tends to be concentrated in coastal states, with Florida and Texas alone comprising nearly 40% of the entire program (in number of policies, premiums and coverage).

Currently, single-family residences can purchase up to \$250,000 of building coverage and up to \$100,000 of contents coverage. Businesses can purchase up to \$500,000 each of building and contents coverage.<sup>13</sup> Prices for these policies vary by flood risk zone as defined on flood insurance rate maps (FIRMs) issued by FEMA, and by characteristics of the building (e.g., year of construction, elevation). In Special Flood Hazard Areas (SFHAs), where the annual risk of a flood is 1 in 100 or greater, homeowners with a mortgage from a feder-

ally backed or regulated lender are required to purchase flood insurance for the life of the loan. But there are several problems with the current system.

## 1. COMPLIANCE

Several data sources suggest that many people do not voluntarily purchase flood insurance even though they are exposed to flood risk. Consider the flood in August 1998 that damaged property in northern Vermont. Of the 1,549 victims of this disaster, FEMA found that 84 percent of the homeowners in flood-prone areas did not have insurance, even though 45 percent of these individuals were required to purchase this coverage.<sup>14</sup> In the Louisiana parishes affected by Katrina, the percentage of homeowners with flood insurance when the hurricane hit ranged from 57.7 percent in St. Bernard Parish to 7.3 percent in Tangipahoa Parish. Only 40 percent of the residents in Orleans Parish had flood insurance.<sup>15</sup>

As pointed out in Mayor Bloomberg's report following Hurricane Sandy:

*New York City estimates that less than 20 percent of residential buildings in areas inundated by Sandy had coverage through the NFIP. The numbers are believed to have been even lower for business; approximately 26,400 businesses with fewer than 50 employees were in the Sandy inundation zone in New York, but only 1,400 commercial NFIP policies were in effect when Sandy hit.*<sup>16</sup>

Moreover, an in-depth analysis of the entire portfolio of the NFIP reveals that the median tenure of flood insurance is between two and four years, while the average length of time in a residence is seven years. Many people purchase coverage when they buy a house but let the insurance lapse after only a few years.<sup>17</sup> This behavior occurs even when homeowners are required to purchase flood insurance as a condition for a federally insured mortgage. Some banks and financial institutions have not enforced this regulation for at least two reasons: few of them have been fined and/or the mortgages are

Ever-Growing Disaster Relief Expectations." Mimeo, The Wharton School.

<sup>19</sup> Kunreuther, H. (1968). "The Case for Comprehensive Disaster Insurance." *Journal of Law and Economics* 11(1): 133–163.

<sup>20</sup> Hayes, T.L., and D.A. Neal. (2011). *Actuarial Rate Review: In Support of the Recommended October 1,*

2011, Rate and Rule Changes. Washington, DC: Federal Emergency Management Agency.

<sup>21</sup> Congressional Budget Office (CBO). (2009). *The National Flood Insurance Program: Factors Affecting Actuarial Soundness.* Washington, DC.

<sup>22</sup> King, R. (2010) *Mandatory Flood Insurance Purchase in Remapped Residual Risk Areas Behind Levees.* Con-

gressional Research Service, 7-5700.

<sup>23</sup> Hayes, T.L., and D.A. Neal. (2011). *Actuarial Rate Review: In Support of the Recommended October 1, 2011, Rate and Rule Changes.* Washington, DC: Federal Emergency Management Agency.

<sup>24</sup> These principles are discussed in more detail in Kunreuther, H., and E. Michel-Kerjan. (2011). *At War with the*

Weather. Cambridge, MA: MIT Press, and Kunreuther, H., M.V. Pauly, and S. McMorro, (2013). *Insurance and Behavioral Economics: Improving Decisions in the Most Misunderstood Industry.* New York: Cambridge University Press.

<sup>25</sup> Government Accountability Office (GAO). (2013). *Flood Insurance: More Information Needed on Subsidized*



transferred to financial institutions on the secondary market in non-flood prone regions of the country that have not focused on either the flood hazard risk or the requirement that homeowners may have to purchase this coverage.

## 2. DISASTER RELIEF

Table 2 shows the pronounced role of the federal government in assisting disaster victims and state governments of affected areas by examining several major disasters occurring in the past 60 years.<sup>18</sup> In the case of Hurricane Sandy, the federal government provided \$50 billion in emergency funds and another \$10 billion to the NFIP so it could pay all its claims.

This radical increase in government

**TABLE 2: ROLE OF FEDERAL GOVERNMENT IN DISASTER LOSS PAYMENT**

DISASTER	FEDERAL CONTRIBUTION TO TOTAL LOSS PAYMENT
Hurricane Sandy (2012)	>80%
Hurricane Ike (2008)	69%
Hurricane Katrina (2005)	50%
Hurricane Hugo (1989)	23%
Hurricane Diane (1955)	6%

funding is likely to set precedents and expectations of more funding to come in the future. This creates economic disincentives for hazard-prone areas to reduce their own exposure and/or purchase proper insurance coverage. It illustrates the Samaritan's dilemma: by providing a large amount of funding, the government actually increases future spending, since communities assume that they will be bailed out after a disaster and therefore decide to encourage development in high-risk areas and not purchase insurance.

The general public appears to know very little as to how much they actually will receive in the way of disaster assistance if

their house is damaged or destroyed by a natural disaster. The reality is that governmental disaster relief is usually earmarked to rebuild destroyed infrastructure, not as direct aid to the victims. For example, as of 2013 the maximum amount that individuals can obtain as a grant from FEMA's Individual Assistance (IA) program to cover home repairs or damage to personal property is \$31,900. Even if some people know this, they are likely to be unaware that the average grant for repair of a damaged home is only around \$4,000.

## 3. PREMIUM DISCOUNTS

Among those who do obtain and maintain flood insurance, premium discounts are given for any structure in place before FEMA had produced flood insurance rate maps (FIRMs) of the area. The discounted premiums given to these pre-FIRM properties were designed to encourage greater participation in the program by both communities and individuals, and not penalize homeowners who would otherwise see a sudden drop in their property values. These discounts were not means-tested and not targeted at lower-income households.<sup>19</sup>

FEMA estimates that roughly 20 percent of flood insurance policies nationwide receive premium discounts, paying roughly 40–45 percent of the full-risk price, although their subsidized premiums are often higher than those structures adhering to building codes because they reflect significantly greater risks.<sup>20</sup>

## 4. REPETITIVE LOSSES

As of 2009, there were 71,000 insured "repetitive loss properties," representing only 1.2 percent of the NFIP portfolio but accounting for 16 percent of total claim payments between 1978 and 2008.<sup>21</sup> About one in ten of these repetitive loss properties have received cumulative flood insurance reimbursements that have exceeded the value of the house.<sup>22</sup>

## 5. INSOLVENCY

While the NFIP aims to achieve financial soundness, there has been an understanding since its inception that there might still be extreme events for which the program would have to borrow money from the U.S. Treasury to pay its claims. This occurred in the 1980s and the money was paid back to the Treasury. But then truly catastrophic flood-related losses occurred during the 2005, 2008 and 2012 hurricane seasons. In fact, Hurricane Katrina and other flood-related losses in 2005 led the NFIP to pay out more claims than it had over the entire life of the program up to that point,<sup>23</sup> and the NFIP borrowing authority had to be increased to \$20.775 billion. While some of this debt has been repaid, the NFIP had to borrow another \$10 billion to pay its claims due to Hurricane Sandy. As of July 2013, this debt stood at \$24 billion. Given that the program currently collects only \$3.5 billion in premiums a year, repaying this debt is an issue.

## ENHANCING RESILIENCE THROUGH FLOOD INSURANCE

Hurricane Katrina, and Hurricane Ike in 2008, spurred a national debate about how the NFIP could be reformed by being made financially sound, incentivizing personal responsibility and better addressing equity issues. The debate lasted for several years and in July 2012 the President signed the National Flood Insurance Reform Act (NFIRA) with overwhelming bipartisan support from Congress, extending the NFIP for five years until September 2017.

## GUIDING PRINCIPLES FOR INSURANCE

NFIRA takes steps to address the recent financial problems faced by the NFIP while making those in flood-prone areas more aware of the risks they face and more accountable for the water-related damage they may suffer from flood and hurricane

Properties. Washington, DC: United States Government Accountability Office.

<sup>26</sup> Kunreuther, H. and E. Michel-Kerjan (2013). "Demand for Multi-Year Insurance: Evidence from Experiments." Memo, Center for Risk Management, The Wharton School.

<sup>27</sup> For more details on the above example of a family

elevating its home and the financial implications to the homeowner and the federal government see Resources for the Future/Wharton Risk Center 2013. Addressing Affordability in the National Flood Insurance Program. RFF-13-12, August.

disasters. The legislation embodies the following two guiding principles that a group of us have proposed so as to make insurance a more meaningful policy tool for reducing future losses.<sup>24</sup>

#### PRINCIPLE 1: FLOOD INSURANCE PREMIUMS SHOULD REFLECT RISK

Insurance premiums should reflect risk to signal to individuals how safe or exposed they are, and the extent to which preventive or protective measures will reduce their vulnerability to property losses. Risk-based premiums should also reflect the cost of capital that insurers need to integrate into their pricing to assure adequate competitive returns to their investors.

Principle 1 provides a clear signal of the risk to those currently residing in areas subject to natural disasters and those considering moving into these regions. As mentioned before, if premiums are risk-based then homeowners and businesses investing in cost-effective loss-reduction measures will benefit by having the price of their coverage reduced because of lower expected losses and hence lower claims in the future, thus providing them with an economic incentive to implement those measures.

If Principle 1 is applied in hazard-prone areas where premiums are currently subsidized, however, some residents will now be faced with large price increases. This concern leads to the second guiding principle.

#### PRINCIPLE 2: EQUITY AND AFFORDABILITY NEEDS TO BE CONSIDERED

In dealing with equity and affordability issues, any special financial assistance given to consumers currently residing in hazard-prone areas should come from means-tested, tax-financed insurance vouchers and not through cross-subsidized insurance premiums for all buyers.

Principle 2 is important because some individuals residing in hazard-prone areas will find that their premiums will increase

considerably when they reflect their true exposure to flood risk and will impose an unexpected financial burden. For this reason we have proposed that a national means-tested insurance voucher program be established so as to make risk-based rates equitable to this subset of individuals. Note that Principle 2 applies only to those lower wealth individuals who currently reside in hazard-prone areas. Those who decide to move to the area should be aware that they will be charged premiums that reflect the risk.

#### FEATURES OF NFIRA

NFIRA addresses the above two principles by authorizing more accurate risk assessments of the flood hazard and focusing on risk-based premiums, while recognizing that affordability issues need to be addressed. Yet challenges remain in implementing the new flood insurance legislation.

#### IMPROVED RISK MAPS

FEMA is now developing more accurate flood maps to set risk-based rates, with \$400 million per year authorized by NFIRA for this purpose over fiscal years 2013–2017. Prior to Hurricane Sandy, FEMA was restudying areas of the New Jersey and New York coastlines so as to update flood insurance rate maps (FIRMs). Because existing FIRMs for these areas were developed more than 25 years ago, and updated FIRMs are not finalized, FEMA determined that it is vital to provide near-term advisory base flood elevations to support reconstruction efforts. Home and business owners suffering damage from Hurricane Sandy in communities adopting these advisory base flood elevations will be required to build higher and safer structures. This also means lower flood insurance premiums to these properties due to the reduced risk of water damage from future hurricanes.

#### RISK-BASED PREMIUMS

Under NFIRA, flood insurance premiums will be increased 25 percent per year until

prices reflect FEMA's best estimate of the flood risk for non-primary residences, severe repetitive loss properties, and business properties. In addition, discounted rates will be eliminated for single-family households when a policy lapses, a property is sold, the property sustains substantial flood damage (defined as damage greater than 50% of the home's value), the property is substantially improved, or a new policy is purchased. The Government Accountability Office (GAO) estimates that roughly 438,000 policies nationwide will see higher rates immediately; 715,000 policies will have their premiums remain at the current level until one of the triggers is met.<sup>25</sup> Starting in October 2014, routine rate revisions will also include a 5% assessment to help the program build a catastrophic reserve fund.

The legislation also calls for the phasing out of grandfathering, a practice that enabled homeowners to keep their old premiums when a new map reclassified them into a higher-risk zone. Going forward, new rates will be phased in by increasing premiums 20 percent per year until the risk-based price is reached for properties mapped into a higher-risk zone.

#### AFFORDABILITY ISSUES

NFIRA authorized studies by FEMA and the National Academy of Sciences to examine ways of incorporating risk-based premiums (*Principle 1*) and the feasibility of means-tested insurance vouchers (*Principle 2*). But the studies have not yet started, and in the meantime, the implementation of NFIRA is now facing serious challenges. While there is general agreement that risk-based premiums provide a sound foundation for an insurance program, many residents in flood-prone areas who will likely see their premiums increase significantly are requesting that their Senators and Representatives maintain the current rates. In fact, affordability concerns have already led Congress to consider proposals to delay or revise this part of the legislation. We feel this is a step

backwards. As detailed below, we believe it is essential to implement NFIRA so as to better incentivize consumers to purchase insurance, while also making this insurance more affordable for lower-income individuals currently residing in areas with high flood risk.

## REDUCING LOSSES AND ADDRESSING AFFORDABILITY BY MODIFYING NFIRA

NFIRA provides a foundation for addressing the two questions posed at the beginning of this Issue Brief: How do we encourage investment in loss reduction measures, and who should pay the costs of preparing for and recovering from disasters? For insurance to play a central role in reducing losses and aiding recovery we propose that NFIRA incorporate the following features:

### REQUIRING FLOOD INSURANCE AND ENSURING THE REQUIREMENT IS ENFORCED

Given the large number of uninsured individuals in flood-prone areas and the tendency for homeowners to cancel their policies after several years, flood insurance should be tied to the property rather than to the homeowner. Doing so would also ensure that exposed properties are covered over time. Insurance should be required of all residences in flood-prone areas for the same reason that automobile insurance is required in all states today: having coverage provides financial protection in the case of a loss. Should the homeowner move to another location, the flood insurance policy would remain with the property. One way to accomplish this would be to introduce multi-year flood insurance into the current menu of insurance contracts, with premiums on the flood insurance policy fixed for a pre-specified time period (for example, 5 years). Recent research shows that there would be a significant demand for such contracts.<sup>26</sup>

### RISK-BASED PREMIUMS AND MEANS-TESTED INSURANCE VOUCHERS

As stated above, flood insurance premiums should reflect risk based on updated flood maps. To deal with equity and affordability issues, homeowners *currently residing* in flood-prone areas whose premiums would increase should be given a means-tested insurance voucher to reflect the difference between the current discounted premium and the risk-based premium. This type of in-kind assistance ensures that the recipients use the funds for obtaining insurance rather than having the freedom to spend the money on goods and services of their own choosing. The amount of the insurance voucher would

**“If appropriate adaptation measures are not adopted, future hurricanes and floods are likely to replace Katrina and Sandy in the rankings of the most costly insured losses in the coming years.”**

be determined by the family’s income, other socio-demographic information (e.g. number of children living at home) and the magnitude of the increase in the insurance premium. Several existing programs could serve as models for developing such a national voucher program: the Food Stamp Program, the Low Income Home Energy Assistance Program (LIHEAP) and Universal Service Fund (USF).

Although a voucher can be justified on equity grounds and can serve as a basis for risk-based premiums, there still may be resistance to this concept by real estate developers and builders and upper-income households. Congress also needs to decide how large the voucher should be and the appropriate way to fund it.

### LONG-TERM MITIGATION LOANS

We propose also to couple means-tested vouchers with required hazard mitigation (risk reduction), financed with low-interest loans. By requiring hazard mitigation, future disaster losses would be reduced both for the NFIP and for families. The proposed voucher program has two key features. First, it is based on risk-based insurance premiums, which are essential for communicating information about flood risk. Second, the vouchers not only cover a portion of the insurance premium, but also the costs of the loan to reduce future damage to the residence.

By spreading the upfront costs of a loss reduction measure over time through a home improvement loan, residents in flood-prone areas would have an economic incentive to mitigate the risk of future flood damages. Suppose a family was offered a 20-year loan at 3 percent to elevate their home four feet at a cost of \$25,000. If they undertook this measure, their risk-based annual flood insurance premium would be reduced from \$4,000 to \$520. If the family takes the loan, the annual payment would be \$1,680. From a financial viewpoint, this package should be attractive, since the reduction in the annual insurance premium of \$3,480 is much greater than the cost of the loan. An innovation would be to market the flood insurance and the home improvement loan as a package tied to the property so the net benefits from undertaking the mitigation measure would be obvious to the homeowner.

One could link issues of affordability to loss reduction in the following way. As a condition for receiving an insurance voucher, the homeowner would be *required* to invest in a cost-effective loss reduction measure. Those homeowners agreeing to do so would also receive a means-tested loan in addition to the insurance premium voucher so they can afford to make their home more resistant to water-related damages from floods and hurricanes. A combination voucher and

loan program can save homeowners money by lowering their flood insurance premiums. This program also would allow the NFIP to lower its exposure through loss reduction measures and would improve its financial soundness through risk-based pricing.<sup>27</sup>

Our recommendations offer a policy solution whereby individuals would reduce their flood risk and become financially protected against future disaster losses, thus reducing the need for taxpayer money for disaster relief in the future. This is a win-win situation that should be attractive to legislators on both sides of the aisle.

## BRIEF IN BRIEF

- The United States has entered a new era of catastrophes, of which floods have been the most devastating.
- Through its 2012 reform (Biggert-Waters Act), the 45-year old federally-run National Flood Insurance Program has an opportunity to highlight the role that risk-based premiums can play in encouraging individuals to undertake loss reduction measures.
- But the implementation of this reform is now being challenged due to concerns that residents cannot afford risk-based premiums.
- We propose that this can be overcome by successfully combining risk-based pricing, required insurance, means-tested insurance vouchers, and mitigation loans, so that individuals reduce their flood risk and are financially protected against future disaster losses, thus reducing the need for taxpayer money for disaster relief in the future.

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