Earthquake Risk, Insurance, and Recovery: Issues for Congress

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Summary

This report examines earthquake catastrophe risk and insurance in the United States in light of recent developments, particularly the devastating earthquakes in Haiti and Chile. It examines both traditional and non-traditional approaches for financing recovery from earthquake losses as well as challenges in financing catastrophe losses with insurance. The report explores the feasibility of a federal residential earthquake insurance mechanism and assesses policy implications of such a program.

So far in the 111th Congress, six bills have been introduced that would broaden the federal government's role in insuring, mitigating, and financing recovery from natural catastrophes. Proposals include (1) establishing a national consortium to allow states to aggregate risk from state-sponsored insurance pools and transfer such risks to the capital markets through catastrophe bonds (H.R. 2555/S. 505), (2) a provision for a tax-free accumulation of reserves to pay catastrophe losses (H.R. 998/S. 1486), (3) a Treasury program to guarantee state-issued debt (H.R. 4014/S. 886), (4) a federal reinsurance backstop (H.R. 83), (5) a provision to establish individual catastrophe savings accounts (S. 1484), and (6) establishing a bipartisan commission to examine catastrophe risks and make recommendations for the management and financing of such risks (S. 1487). On March 10, 2010, the House Subcommittee on Housing and Community Opportunity and Subcommittee on Capital Markets, Insurance, and Government Sponsored Enterprises held a joint hearing on H.R. 2555. A mark up on H.R. 2555 is expected in April 2010.This report will be updated as events warrant.

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Recent Developments

On January 12, 2010, a magnitude 7.0 earthquake struck near Port-au-Prince, Haiti, causing widespread economic losses from property damage—the worst in the Caribbean region in more than 200 years. Aftershocks were felt in the Dominican Republic, Cuba, and Jamaica, though little to no damage occurred outside of Haiti. While smaller earthquakes are relatively common, the last major earthquake to affect Haiti was in 1842.[1] The Haiti earthquake occurred along the Enriquillo Fault Zone, which runs east-west along Haiti's southwest peninsula. The islands that form the Lesser Antilles and Greater Antilles outline the contact zone between the Caribbean and North American plates. According to the USGS, this region is seismically active due to the relative motion between the plates, and the Haiti earthquake has generated many aftershocks that will likely continue for months. The potential for future earthquakes in the surrounding regions appears to be high, according to the USGS. Earthquakes greater than magnitude 7 have occurred in Puerto Rico, Jamaica, Dominican Republic, Martinique, and Guadeloupe over the last century.[2]

The United States Geological Survey (USGS) reported that the geological fault that caused the Haiti earthquake is part of a seismically active zone between the North American and Caribbean tectonic plates.[3] The proximity of the Haiti earthquake to the New Madrid Seismic Zone (NMSZ) in the Central United States, and a number of major U.S. population centers with a high level of economic development, has reminded U.S. policymakers about the earthquake threat to the interior of the continental United States and the need to have contingency plans in the event of a mega-catastrophic earthquake.[4] A mega-catastrophe is defined as a catastrophic event that causes losses so large and unpredictable that private insurers either resist offering coverage or charge premiums so high that significant numbers of customers do not want or cannot afford the insurance.

Reinsurance broker Holborn Corp. has estimated economic damage to property values in Haiti to be over $10 billion. Because of the country's low income rates and limited insurance penetration, insured losses are expected to be a fraction of economic losses, perhaps in the low-single-digit billions of dollars.[5] The Haiti government received an $8 million payment from the Caribbean

[1] Two large earthquakes in the middle of the 18th century occurred close to Port-au-Prince, likely along the same fault line, and caused widespread devastation. These occurred in 1751 and 1770 and both had an estimated magnitude of 7.5.

[2] See United States Geological Survey Issues Assessment of Aftershock Hazards in Haiti, available at http://www.usgs.gov/newsroom/article_pf.asp?ID=2385.

[3] Ibid.

[4] Two quakes of 7.0 magnitude or greater have occurred in the United States in the last 125 years: the 1906 San Francisco earthquake (a 7.7 magnitude quake which killed about 3,000 people) and the 1886 Charleston, SC, quake (a 7.3 quake that killed about 100 people), according to the USGS.

[5] London-based Axco Insurance Information Services Ltd. estimates that total non-life insurance premiums in Haiti amount to less than $20 million annually. See http://www.claimsmag.com/News/2010/1/Pages/Haiti-Lacks-Insurance-for-Earthquake-Losses.aspx.

Catastrophe Risk Insurance Facility (CCRIF) as a result of insured losses from the recent earthquake. The funds will serve as a revenue stream for the government to continue operating after the earthquake. CCRIF is a risk-pooling facility owned, operated, and registered by 16 Caribbean governments in partnership with the World Bank and established to provide economic stability for the catastrophe-prone region. CCRIF allows Caribbean countries to pool catastrophic risks, reduces the cost of insurance, and provides Caribbean governments with short-term liquidity when the policy is triggered after a major hurricane or earthquake. The recent earthquake was of sufficient magnitude to trigger the full policy limit for the earthquake coverage, effecting payment after a 14-day waiting period.

Researchers at the USGS, insurance market experts, and computer modeling companies agree that the potential cost of earthquakes continues to grow due to increasing urbanization in seismically active areas and the vulnerability of older buildings that have not been upgraded to meet current building codes. The most recent earthquakes in the United States have been of relatively low magnitude and did not result in major losses. On February 10, 2010, the USGS reported that a 3.8 magnitude earthquake hit about 50 miles northwest of Chicago with ground shaking felt as far as Wisconsin, Iowa, and Indiana. There were no reports of injuries or damage. In December 2009, four small quakes with a 3.1 magnitude were felt in Arkansas, Missouri, Tennessee, and Kentucky without any economic damages reported. Three months earlier, on September 30, 2009, an 8.0 magnitude underwater earthquake struck 125 miles from the U.S. territory of American Samoa. Again, there were no reported economic damages.

The 2008 National Seismic Hazard Maps by the USGS have changed the perception of earthquake risk in the United States.[6] Catastrophe modeling firms have updated their models with research from the latest maps, bringing potentially significant implications for how insurers and reinsurers manage, underwrite, and price U.S. earthquake risk. Since a 6.7 earthquake shook the Northridge areas of southern California on January 17, 1994, claiming 60 lives, injuring over 7,000, and leaving 20,000 homeless, Americans have not experienced another major quake in terms of lost lives and property damages.

A major earthquake could still have catastrophic impact on insurance companies and the insured, impose significant costs on the U.S. economy, and disrupt U.S. financial markets. Although individual insurance companies could face massive losses from a major earthquake, the industry as a whole is not likely to become insolvent for two reasons. First, U.S. earthquake construction standards are higher than Haiti's, so the damages would presumably not be as extensive. Second, there is generally a low purchase rate for earthquake insurance. The relative lack of earthquake coverage is thought to be due to costly premiums, large deductibles, and limited availability of coverage, resulting in reliance on government disaster relief in the event of a mega-catastrophe.

Financing economic recovery after a major earthquake is likely to be costly and require both private and public recovery funds. Currently, money to finance disaster recovery comes from state and federal disaster aid, private and public insurance, private loans, contingent financing, and personal savings. Insurance is arguably the most efficient form of pre-disaster risk financing to mitigate losses and reduce the financial vulnerability of property owners and governments to earthquake risk exposure.

[6] See U.S. Geological Survey, 2008 National Seismic Hazard Maps, located at http://pubs.usgs.gov/fs/2008/3018/pdf/FS08-3018_508.pdf.

Since the late 1990s, capital markets have entered the reinsurance business through the provision of alternative risk transfer (ART) and financing instruments that provide excess of loss coverage at the highest loss levels. ART allows domestic insurers to leverage retained capital to help increase insurance loss capacity and reduce their sensitivity to extreme events. Catastrophe bonds, for example, currently offer insurers and reinsurers an innovative approach to financing disaster risks by transferring some of the catastrophe risk to global financial markets.

The vast majority of businesses and individuals in seismic zones do not purchase earthquake insurance, preferring to take their chances rather than pay for protection at the cost that may be considered too expensive for such a remote event. As a result, the government, through taxpayer-financed federal disaster assistance for disaster victim compensation, has become the de facto insurer of last resort and source of financial protection after a disaster occurs.

In the 111th Congress, several earthquake catastrophe risk and insurance issues could arise, including (1) revisiting the nature and extent of earthquake and tsunami hazards in the United States and (2) addressing the challenges of financing recovery given limited capacity of national financial markets to absorb the cost and economic burden of a devastating mega-earthquake. Policymakers are concerned about finding ways to reduce society's disaster risk to help homeowners, insurance companies, financial firms, and federal and state governments reduce future losses from natural hazards. Members of Congress have begun to explore alternative policy designs and to consider helping the private sector pre-fund and diversify disaster risk by financing catastrophic losses through insurance, reinsurance, and capital from financial institutions and the investment community. These approaches are discussed below.

Basics of Residential Earthquake Insurance

Many people assume their residential insurance policy fully protects them, but most standard homeowners', mobile-home owners', condominium, and renters' insurance policies do not cover earthquake damage. The **Appendix** illustrates the earthquake hazard exclusion language in standard homeowners' policies. Earthquake coverage must be purchased as an endorsement to an existing homeowner's or business owner's policy or as a separate policy. It includes coverage for damage to the building structure, contents or personal property, and loss of use of the structure. In the case of commercial business the policy covers loss of business income. Vehicles are covered for earthquake damage by the comprehensive insurance policy of an automobile policy.

In general, consumers typically experience multiple challenges concerning residential earthquake insurance offerings, including the following:

- policy premiums that viewed as unreasonably expensive;
- deductibles that are 15% of the amount of the policy (not the loss);
- lack of knowledge that earthquake coverage is available or misinformation concerning the terms of such insurance; and
- lack of adequate incentive to take preventive action to reduce shaking losses, fire losses, and injuries.

California is the only state that requires insurers that sell residential property insurance to offer earthquake coverage to their policyholders. After the earthquake in Northridge, California, in 1994, most insurers either stopped selling new homeowners' insurance policies or greatly

restricted the sales of such policies. In 1995, as a result of insurers' reluctance to offer earthquake insurance because of the fear of insolvency, the California state legislature created a privately financed, publicly managed organization—the California Earthquake Authority (CEA)—to offer primary coverage for property losses arising from a seismic event. In offering earthquake coverage, insurance companies can become a member of the CEA and offer the CEA's residential earthquake policies, or they can manage the risk themselves. To date, companies that sell over two-thirds of the residential property insurance in the state have opted to become CEA participating companies. The CEA began providing residential earthquake insurance in December 1996 with a $10.5 billion funding package.

U.S. Exposure to Earthquake Risk

Calculating earthquake risk levels depends upon proximity to earthquake faults, the age and type of dwellings, and the soil types near those dwellings. Some parts of the country that have not experienced earthquakes for 200 years or more might be more susceptible to earthquakes than areas that have experienced recent earthquakes. The reason is that earthquake faults build up tension over long periods of time, which become earthquakes when that tension is suddenly released. It is theorized that relatively recent earthquake activity means that faults have released built-up tension—a lack of earthquake activity can mean that tension is still building and could be released at any time as an earthquake.

Table 1 shows that on average over 3,000 earthquakes strike the United States each year. Based on insured loss data provided by the Insurance Services Office, a relatively few earthquakes cause disastrous accumulation of economic losses because most occur in sparsely populated areas. Most Americans live in areas considered "seismically active," although the degree of vulnerability to earthquake risk varies greatly. The size and geographical location of the quake, and to some extent its timing, determine the magnitude of economic losses from property damages. According to the A.M. Best Company, an insurance-rate-making company based in Newark, New Jersey, earthquakes have caused insured property losses in every U.S. state during the past 100 years, but potentially damaging earthquakes are more likely to occur along the Pacific coast, the Mississippi valley around New Madrid in Missouri, Alaska, Utah, South Carolina, and the New England region around Boston.[7]

Table 2 shows the estimated impact of historical U.S. earthquakes if they were to happen today. On August 6, 2009, AIR Worldwide and Risk Management Systems (RMS) announced releases of new earthquake models for North America.[8] The new model versions, based partly on the 2008 USGS National Seismic Hazard Maps, produce significantly reduced loss estimates for most regions of the United States. While the amount of reduction varies by model, by region, and by type of business, most companies with significant earthquake exposure saw large reductions in their model loss estimates. Implemented as is, these changes will affect company risk management decisions, including earthquake underwriting, pricing, and reinsurance purchasing.

[7] A.M. Best Company, Inc., *2006 Annual Earthquake Study*, October 16, 2006.

[8] Business Insurance, *Catastrophe Modellers Update Earthquake Risk Models*, August 6, 2009, at http://www.globalquakemodel.org/node/420.

Table 1. Number of Earthquakes in the United States: 2000-2010

Magnitude	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
8.0 to 9.9	0	0	0	0	0	0	0	0	0	0	0
7.0 to 7.9	0	1	1	2	0	1	0	1	0	0	0
6.0 to 6.9	6	5	4	7	2	4	7	9	9	3	1
5.0 to 5.9	63	41	63	54	25	47	51	72	85	53	1
4.0 to 4.9	281	290	536	541	284	345	346	366	432	290	16
3.0 to 3.9	917	842	1,535	1,303	1,362	1,475	1,213	1,137	1,486	1,449	40
2.0 to 2.9	660	646	1,228	704	1,336	1,738	1,145	1,173	1,573	2,335	39
1.0 to 1.9	0	2	2	2	1	2	7	11	13	25	1
0.1 to 0.9	90	0	0	0	0	0	1	0	0	1	0
Below 0.1	15	434	507	333	540	73	13	22	20	18	0
Total	**2,342**	**2,261**	**3,876**	**2,946**	**3,550**	**3,685**	**2,783**	**2,791**	**3,618**	**4,174**	**98**

Source: United States Geological Survey, *Earthquake Facts and Statistics*, available at http://earthquake.usgs.gov/earthquakes/eqarchives/year/eqstats.php.

Table 2. Estimated Insured Loss from the Top 10 Historical Earthquakes Based on Current Exposure,

$ billions

Rank	Date/Year	Location	Magnitude	In 2009 Dollars
1	February 7, 1812	New Madrid, MO	7.7	$100
2	April 18, 1906	San Francisco, CA	7.8	96
3	August 31, 1886	Charleston, SC	7.3	37
4	June 1, 1838	San Francisco, CA	7.4	27
5	January 17, 1994	Northridge, CA	6.7	21
6	October 21, 1868	Hayward, CA	7.0	21
7	January 9, 1857	Fort Tejon, CA	7.9	8
8	October 17, 1989	Loma Prieta, CA	6.3	6
9	March 10, 1933	Long Beach, CA	6.4	5
10	July 1, 1911	Calaveras, CA	6.4	4

Source: AIR Worldwide Corp., *Estimated Insured Loss From the Top 10 Historical Earthquakes Based on Current Exposure*, available at http://www.air-worldwide.com/PublicationsItem.aspx?id=18484.

Financing Recovery from Earthquake Losses

At present, funds to finance earthquake recovery come from several sources: state and federal disaster aid, insurance, private loans, personal savings, and structured finance securitization. Insurance is the most common form of financing of recovery from catastrophic disasters, such as earthquakes and hurricanes. While it is widely agreed among disaster policy experts that

insurance by itself would not mitigate losses from seismic hazards, when combined with options such as structural and non-structural mitigation, building codes, and land-use planning, insurance could be used as a financial incentive for action designed to help reduce losses from future earthquakes.

Insurance involves the collection of premium from pool participants before an event occurs so that a source for payouts is available to compensate victims following a disaster. Insurance pools typically purchase reinsurance to diversify catastrophe risk, expand the capacity of the pool to cover risks, and hedge against the possibility of bankruptcy from catastrophic risks. Insurance also provides other benefits beyond post-event compensation, namely property loss mitigation. Commercial insurance may be viewed as a risk-financing tool used to accumulate funds in preparation for future earthquake disasters, diversify risk among the international capital markets, and reduce the direct impact of disasters on property owners. As a risk-transfer strategy, insurance may also be used to help minimize catastrophe losses, reduce the government's exposure to post-disaster payouts, and provide a safety net for property owners and communities affected by natural disasters, such as earthquakes.

A brief review of the financial capacity of the U.S. property and casualty insurance and reinsurance industry reveals that the insurance industry's capacity to handle large catastrophic losses may be substantially less than aggregate figures suggests. A repeat of the 1906 San Francisco earthquake could cost insurers almost $100 billion in insured property damages. According to the Insurance Information Institute, the policyholders' surplus of the entire property and casualty insurance industry was $490.8 billion as of September 30, 2009.[9] Policyholders' surplus is defined as the "net worth" or "owners' equity" of a firm. It is a measure of the capacity of insurers to underwrite policies, and it must increase to meet the demands of a growing U.S. economy and claims from hurricanes and other natural hazards. Only a fraction of this industry-wide total surplus amount (e.g., approximately 20%) would be available to compensate victims of a major earthquake. Furthermore, insurers must rely on this same portion of total surplus to pay for other potentially catastrophic and unpredictable risks.

Challenges in Financing Earthquake Loss

The 111th Congress may choose to assess whether existing sources of funding of catastrophe losses will be adequate to finance recovery from a mega-catastrophe earthquake. In the aftermath of mounting natural disaster losses over the last two decades, property and casualty insurers have sought to limit their exposure to catastrophe risk while simultaneously exploring new and innovative sources of capital aimed at financing catastrophe losses. Although insurers are skilled at handling high-frequency, low-severity "non-catastrophic" events, like auto and home losses, that follow a predictable claims frequency and magnitude, they face substantially greater difficulty when attempting to price and insure low-occurrence-probability, high-consequence (LP-HC) risk. Furthermore, there is a finite amount of protection (capacity) that the insurance industry can offer to finance a mega-catastrophic earthquake. The amount of catastrophe insurance coverage is limited by the potential magnitude of possible insured losses, the sporadic and unpredictable nature of earthquakes, and ability to accurately estimate future losses and price coverage. Moreover, existing regulatory and accounting systems also result in catastrophe

[9] For more information, see Insurance Information Institute, *2009 - First Nine Months Results*, available at http://www.iii.org/Financial_Results/2009-First-Nine-Months-Results.html.

reserves being taxed as profits, discouraging insurers from accumulating loss reserves for catastrophes. Current tax laws discourage establishment of a reserve for a loss that has not occurred.

The amount of catastrophic insurance is limited by

- actuarial and rate-setting difficulties;
- industry capacity to meet the payout requirements resulting from a mega-catastrophic earthquake;
- difficulties in determining both the insurability of properties and the damages resulting from earthquakes;
- adverse selection and risk-spreading difficulties, including those associated with reinsurance;
- accounting and Internal Revenue Service constraints on the build-up of insurance company catastrophe loss reserves; and
- ineffectiveness of current loss-reducing activities (building-code enforcement and land-use zoning).

A general discussion of these interrelated challenges follows.

Actuarial and Rate-Setting Difficulties

One set of challenges facing private insurers involves actuarial and rate-setting difficulties that stem from the lack of sufficient data on past losses to estimate the chance of future losses and the potential for catastrophic losses that can jeopardize insurers' financial stability. Estimating future losses is difficult because earthquakes occur infrequently and at any location, and the magnitude of losses is highly uncertain. Insurers must instead predict losses from technical studies and computer simulation models, which may arguably be less reliable than actual prior historical loss data.

Insurers would need to set a premium for each potential customer or class of customers in order to generate enough revenue to cover both the expected loss and earn a profit. Insurers must be able to estimate the frequency of specific events occurring and the magnitude of the loss should the event occur, a condition limited by the low-probability/high-consequence nature of earthquake risk and the difficulty in identifying what losses may occur. Insurance companies risk insolvency or being uncompetitive by underpricing or overpricing, respectively.

Adverse Selection and Risk Spreading

Insurers also face adverse selection and risk-spreading difficulties, including access to adequate reinsurance for earthquake peril. The problem is that risk is not sufficiently spread over a larger geographical area including areas which are relatively unlikely to suffer a catastrophic earthquake. Traditional insurance principles for insurability require that there is sufficient demand to yield appropriate levels of income revenue for insurers to supply the coverage. There is a tendency for mostly high-risk consumers to purchase policies. This results in a poor spread of risk and an inadequate premium base. Economists note that this "adverse selection" problem in insurance markets generally persists for two reasons: (1) the insured possess information on their

particular risk, which is unknown to the insurer; and (2) consumers have short time horizons in determining the expected benefits relative to the up-front costs (rates and deductibles), or compare costs with potential benefits and conclude that loss-reduction measures are not good investments. Insurers may attempt to address or correct this asymmetrical information problem by creating different risk categories with corresponding price differences to discourage high-risk consumers from purchasing the low-premium policy.

Tax, Accounting, and Regulatory Constraints

Another set of challenges to financing catastrophe risks involve tax policy and regulatory constraints on the build-up of insurance company catastrophe loss reserves and the industry's ability to raise external capital during times of financial crisis. Under current federal income tax provisions, premiums collected by insurers and placed in a reserve fund for catastrophes are treated as excess profits and taxed at the corporate income tax rate. Insurers view this as a major impediment to marketing of earthquake insurance, and they have supported a longer loss carry-forward period or tax-free reserves for potential earthquake losses.[10] Insurers might consider offering insurance coverage at a price level high enough to cover the high-end in the range of expected losses. The rate, however, would be so high that it may not be marketable or regulators may not approve extremely high catastrophe rates. At this point, insurers typically have opted to withdraw from lines of insurance in catastrophe-prone areas.

Low Insurance Participation

A high percentage of property owners in areas prone to earthquakes simply do not have earthquake insurance, relying instead on good fortune or federal emergency disaster relief assistance to cover uninsured losses. Researchers have found that Americans are reluctant to purchase earthquake insurance because of the high cost of insurance and low likelihood of a disaster.[11] Moreover, earthquake insurance is not required as a condition for federally secured mortgages, as is currently the case of flood insurance in federally designated flood zones. Fannie Mae and Freddie Mac require homeowners with federally backed mortgages to buy insurance for flood and windstorm damage, but not for earthquakes. Fannie and Freddie have dramatically changed the landscape for homeowners' property insurance by not requiring coverage for earthquakes. The penetration of earthquake insurance has been low, and the government, through disaster relief assistance, continues to serve as the predominant bearer of earthquake catastrophe risk.

The lack of insurance or underinsurance against earthquakes could negatively impact bond and equity markets, the mortgage loan industry, and government budgets at all level. With roughly 12% to 15% of exposed mortgaged properties covered by earthquake insurance nationwide, a mega-catastrophe could leave a number of mortgages in default with lack of sufficient underlying market value. In the case of mortgages that are packaged and sold by the federal mortgage agencies, uninsured losses are absorbed by those agencies, a situation that could create a strain on

[10] For more information, see CRS Report RL33060, *Tax Deductions for Catastrophic Risk Insurance Reserves: Explanation and Economic Analysis*, by Rawle O. King.

[11] Howard Kurreuther and Paul R. Kleindorfer, "Managing Catastrophe Risk: Why Do Homeowners, Insurers, and Banks Not Use Simple Measures to Mitigate the Risk from Hurricanes and Earthquakes?" *Regulation*, Vol. 23, Issue 4, March 8, 2001.

the U.S. financial system and do little to help the owners of the distressed properties. In addition, federal, state, and local governments would likely be called upon to expend funds in emergency response and recovery at the same time as they lose tax revenues. Meanwhile, federal policymakers have focused on finding ways to enhance the private sector's ability to spread risk.

Is Federal Earthquake Insurance Feasible?

As stated earlier, a basic principle of insurance is the reduction of overall risk by pooling or spreading individual, independent risks. Insurance companies typically price risks where the frequency and severity of potential claims are limited, estimable, and stable. This principle and insurance practice tends not to hold when a single event affects many insureds simultaneously, as in the case of a major earthquake. In the event of uninsured losses, the federal government has become the de facto bearer of the cost of repairing or reconstruction of buildings damaged by catastrophic earthquakes. Another option, however, may be to create a national catastrophe fund (federal residential earthquake insurance program) to ensure adequate capacity and solvency of the insurance industry to meet consumer demand for protection against earthquake risks, which could minimize federal outlays for uninsured losses.

An explicit government insurance program could have several advantages: limited bankruptcy risk, the ability of the government to spread risk over time, financing of short-run losses by borrowing, and lower requirements for federal disaster relief. The disadvantages would be the potential burden on taxpayers, weak underwriting incentives to keep the cost of claims low, preemption of existing and future private sector capacity, difficulty in implementing or sustaining risk-based pricing in a political environment, and potential impediments to capital market innovations, such as catastrophe bonds and options, that securitize catastrophe risk.

Since the late 1960s, the prevailing thinking among federal and state legislators and regulators has been that earthquake risks could be managed and financed in the private sector. Congress explicitly chose not to implement a federal earthquake insurance program because the justification that the earthquake hazards could not be insured by the private sector had not been convincingly made.[12] Policy debate during and after the 88th Congress following the 1964 earthquake and accompanying tsunami at Alaska's Prince William Sound led to the creation in 1968 of the National Flood Insurance Program (NFIP).[13] Congress, however, waited several years before addressing the nation's exposure to earthquake hazards with the creation of the National Earthquake Hazards Reduction Program (NEHRP) in 1977.[14] NEHRP established for the first

[12] See letter of transmittal accompanying the Federal Insurance Administration report issued pursuant to Section V of the Southeast Hurricane Disaster Relief Act of 1965 from George K. Bernstein, Federal Insurance Administrator, to Honorable George W. Rommey, Secretary of Housing and Urban Development, dated November 23, 1971. The letter was included as the foreword to the report.

[13] The National Flood Insurance Program was established under the National Flood Insurance Act of 1968 (P.L. 90-448, title XIII, § 1360, August 1, 1968, 82 Stat. 476, codified at 42 U.S.C. §§ 4001-4128).

[14] The NEHRP was established by the Earthquake Hazard Reduction Act of 1977 (P.L. 95-124; 91 Stat. 1098; Oct. 7, 1977). The NEHRP consists of four agencies: Federal Emergency Management Agency (FEMA); National Institute of Standards and Technology (NIST); National Science Foundation (NSF); and United States Geological Survey (USGS). The goals of NEHRP are to (1) reduce earthquake losses, (2) improve techniques to reduce seismic vulnerability of facilities and systems, (3) improve seismic hazards identification and risk-assessment methods and their use, and (4) improve the understanding of earthquakes and their effects.

time a federal policy to encourage research on and implementation of methods to reduce earthquake losses.

Substantial progress has been made in the fields of earthquake science and engineering following the implementation of NEHRP, particularly with respect to seismic hazard identification and strategies to reduce seismic vulnerability of facilities and systems through land use practices and improvements in design and construction techniques. Disaster policy experts agree that despite the effort of four federal agencies that collaborate under the NEHRP, one issue that has not been adequately addressed is the economic consequences of a catastrophic earthquake, and the efficiency and adequacy of present mechanisms for financing catastrophic earthquake recovery. NEHRP was not required to address this issue.

Policy Issues and Questions

The 111th Congress is likely to face the following key policy questions with respect to earthquake risk, insurance, and recovery:

- Is earthquake risk uninsurable in the private market?
- Is a federal residential earthquake insurance program feasible?
- What are the costs and benefits of government intervention in the catastrophe insurance market?
- Do benefits outweigh costs to taxpayers for providing a financial backstop for the insurance industry?
- Should federal earthquake insurance be compulsory, and, if so, what would be the enforcement mechanism?
- What should be the role of land-use regulations and building codes? Is current insurance regulation conducive to creating private sector incentives for mitigation?

In broadening this discussion beyond earthquake insurance to catastrophe risks insurance in general, insurance market experts recognize that the risk of a mega-catastrophic event could pose a significant capacity and liquidity problem for insurers who receive relatively stable premium flows but suddenly need large amounts of cash to cover disaster losses. A sudden loss of policyholder surplus, which is the statutory net worth or cushion available to insurers for handling the unexpected, could have an adverse effect on the financial strength of the property and casualty insurance industry. To better manage catastrophic risk, insurers have sought to raise premiums, impose a percentage deductible, and reduce the amount of concentration of their exposures. These changes have led to availability and affordability problems for many homeowners in disaster-prone areas.

Finally, various government actions, such as access to federal disaster assistance or insurance, are likely to affect the behavior of individuals and firms in responding to catastrophe risk. By making disaster-prone areas safer through a federal earthquake insurance scheme, however, government policy could have the unintended consequence of creating incentives for people to move into harms way, which would increase the potential for catastrophic property damages and economic

losses. Hence, Congress will find no shortage of issues to debate and resolve when considering proposals to establish a federal earthquake insurance program.

Legislation

So far in the 111th Congress, six legislative approaches have been introduced that would broaden the federal government's role in insuring, mitigating, and financing recovery from natural catastrophes in the United States. Proposals include the following: (1) establishing a national consortium to allow states to aggregate risk from state-sponsored insurance pools and transfer such risks to the capital markets through catastrophe bonds (H.R. 2555/S. 505), (2) a provision for a tax-free accumulation of reserves to pay catastrophe losses (H.R. 998/S. 1486), (3) a Treasury program to guarantee state-issued debt (H.R. 4014/S. 886), (4) a federal reinsurance backstop (H.R. 83), (5) a provision to establish individual catastrophe savings accounts (S. 1484), and (6) establishing a bipartisan commission to examine catastrophe risks and make recommendations for the management and financing of such risks (S. 1487).

H.R. 2555/S. 505 (Klein/Nelson). The *Homeowners Defense Act of 2009* would facilitate the expansion of the market for securitized insurance risks.[15] These bills would create a National Catastrophe Risk Consortium ("Consortium") that would allow states to pool large natural catastrophe risks within the Consortium and then transfer them to the private capital markets through the issuance of catastrophe bonds. The Consortium is premised on finding a low-cost catastrophic-risk-financing solution that generates market competition by exposing risk-transfer opportunities in a way that makes evident the cost savings for participants using the system, possibly in real (or near real) time. On March 10, 2010, the House Financial Services, Subcommittee on Housing and Community Opportunity and Subcommittee on Capital Markets, Insurance, and Government Sponsored Enterprises held a hearing on H.R. 2555. A mark up on the bill is expected in April 2010.

H.R. 998/S. 1486 (Rooney/Nelson). The *Policyholder Disaster Protection Act of 2009* would amend the Internal Revenue Code to allow insurers to accumulate tax-deferred reserves for catastrophe losses such as windstorms, earthquakes, fires, or floods.

H.R. 4014/S. 886 (Sanchez/Nelson). The *Catastrophe Obligation Guarantee Act of 2009* would authorize the Secretary of the Treasury to establish a program to provide guarantees for debt, including principal and interest, issued by state catastrophe insurance programs to assist in financing recovery from natural catastrophes. The guarantees for eligible state programs that cover earthquake peril shall not exceed $5 million and $10 million for all other perils. The bill also has a provision designed to encourage and support programs to mitigate losses from natural catastrophes for which the state insurance or reinsurance program was established to provide insurance coverage.

H.R. 83 (Brown-Waite). The *Homeowners' Insurance Protection Act of 2009* would create a federal reinsurance mechanism to encourage states to establish catastrophe funds for homeowners' insurance. The program would help states better prepare for and protect their citizens against natural catastrophes, encourage and promote mitigation, and finance recovery after a catastrophic event.

[15] For more information, see CRS Report RS22756, *The Homeowners' Defense Act: An Overview*, by Rawle O. King.

S. 1484 (Nelson). The *Catastrophe Savings Accounts Act of 2009* would amend the Internal Revenue Code of 1986 to create catastrophe savings accounts.

S. 1487 (Nelson). *Commission on Catastrophic Disaster Risk and Insurance Act of 2009* would establish a bi-partisan commission to examine the risks and recommend possible solutions for Americans living in natural-disaster-prone areas.

Appendix. Standard Property Insurance Earthquake and Flood Exclusion Language

We do not pay for loss resulting directly or indirectly from any of the following, even if other events or happenings contributed concurrently, or in sequence, to the loss:

(1) by earth movement, due to natural or man-made events, meaning earthquake including land shock waves, or tremors before, during or after a volcanic eruption, mine subsidence; landslide; mud-slide; mud flow; earth sinking; rising or shifting. Direct loss by Fire, Explosion, Sonic Boom, Theft, or Breaking of Glass resulting from earth movement, mine subsidence, landslide, mud-slide, mud flow, earth sinking, rising or shifting is covered.

(2) by water damage, meaning:

(a) flood, surface water, waves, tides, tidal waves or overflow of a body of water. We do not cover spray from any of these, whether or not driven by wind;

(b) water or sewage which backs up through sewers or drains; or

(c) water below the surface of the ground. This includes water which experts pressure on, or flows, seeps or leaks through any of a building or other structure, sidewalk, driveway, foundation, or swimming pool.

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