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Catastrophic Risk in California
Are Homeowners and Communities Prepared?

Lloyd Dixon

RAND Office of External Affairs

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Chairman Monning, Vice Chairman Gaines and members of the Committee, thank you for the opportunity to speak today. My name is Lloyd Dixon, and I am Director of the Center for Catastrophic Risk Management and Compensation at the RAND Corporation. RAND is a non-profit, non-partisan research organization headquartered in Santa Monica. We have been examining the systems in place to address the catastrophic risks facing this country, focusing on compensation and recovery following an event.

California is poorly prepared for the major risk that earthquakes pose to the economic well-being of its businesses and residents. For this reason, I would like to focus my comments on the overall structure of the earthquake insurance system. Let me first describe the current situation and then share some thoughts on how the insurance system for earthquake risk can be improved.

The Current Situation

Currently, the take-up rate for residential earthquake insurance is very low—on the order of 10 percent for the state as a whole. Insurance thus will not provide the resources needed to repair and rebuild damaged homes for the vast majority of California homeowners following a major earthquake. The absence of insurance also means that insurance rates are not providing owners and builders incentives to mitigate risk for existing structures and to better design new ones.

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3 A more informative statistic would be the proportion of residential structures in high-risk areas that have earthquake insurance. However, such statistics are not readily available. One study that did develop estimates for each of the 19 territories into which the California Earthquake Authority divides the state found low take-up rates in the territories CEA considers to be at higher risk. For example, take-up is less than 5 percent in parts of Southern California’s Inland Empire, an area with some of the highest risk. Take-up is about 12 percent in the CEA territory that runs from San Francisco down to San Jose and around to Berkeley (see Thomas Longwell, “An Empirical Examination of Demand for Earthquake Insurance in California,” University of Minnesota, March 12, 2013). More detailed breakdowns are still needed.
The low take-up rate means that when the Big One hits, Californians will in all likelihood need to turn to the federal government to repair homes and restart the economy. The massive assistance and rebuilding programs approved by Congress following Hurricanes Katrina and Sandy support expectations that aid will flow to California after the Big One, but it would not be good public policy to rely solely on this source for the following reasons:

- Federal aid packages are unpredictable, and homeowners cannot be certain about what percentage of their losses will be covered.4
- Programs to distribute federal assistance can take a long time to implement. For example, New York City has set up a “Build it Back” program with federal funding to provide payments to repair homes damaged by Hurricane Sandy. However, over a year after the disaster, City officials are still making major changes in the design and implementation of the program.5 The slow pace of payment delays recovery and lengthens the time before families can return to their normal lives.
- Federal bailouts for all the catastrophes that occur across the nation increase the federal deficit and suppress incentives to purchase insurance or take mitigation measures. Although California might expect its due after a large earthquake, a system of ongoing federal bailouts for regional risks is not a direction in which we as a nation should be heading.

How Can We Improve the Earthquake Insurance System?

Insurance is an attractive way to address economic and financial risks. When properly priced, it provides the appropriate incentives to avoid or mitigate such risks. Claims payments following a loss also facilitate rebuilding and recovery, and a well-established and properly functioning claims processing system can deliver prompt payments. For insurance to work, however, conditions must be met both on the demand and supply sides of the market.

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4 This approach can lead to inequity in the amount of compensation provided from event to event due to media coverage and other factors not directly tied to victims’ true need. See Thomas Eisensee and David Strömberg, “News Droughts, News Floods, and U. S. Disaster Relief.” Quarterly Journal of Economics (2007) 122 (2): 693-728.
Improvements on the Demand Side of the Market

On the demand side, consumers must be willing to purchase earthquake insurance at rates that reflect expected loss. Unfortunately, people tend to think low probability events are not going to happen to them and that, when such an event does occur, the government is going to bail them out. The federal government deals with this problem in the context of flood risk by requiring most homeowners in high-risk areas to purchase flood insurance. The low take-up rate for homes not subject to this mandatory purchase requirement illustrates the continuing need for this requirement.

For earthquake insurance to work on a broad scale in California, some sort of government program to require or strongly incentivize the purchase of coverage will likely be necessary. For example,

- The California Department of Insurance could require homeowner’s insurance policies to cover earthquake losses—with underwriting risk ceded to the California Earthquake Authority (CEA).
- Absent a mandatory coverage requirement, the purchase of insurance might be encouraged by a property tax assessment or state income tax penalty for homeowners who fail to purchase earthquake coverage.

Requiring earthquake insurance can create hardship for current property owners. Changes will create the greatest hardship for households with limited assets or low incomes. The National Flood Insurance Program is currently wrestling with this affordability issue and is considering a means-tested voucher program. A similar approach might be considered for earthquake risk in California.

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6 See for example Howard Kunreuther and Erwann Michel-Kerjan, At War with the Weather, MIT Press, 2009, pp. 121-124.
7 Homes without mortgages are not subject to the mandatory purchase requirement, and the take-up rate in high-risk areas for such homes is only about 20 percent. See Lloyd Dixon, Noreen Clancy, Bruce Bender, Aaron Kofner, David Manheim, Laura Zakaras, Flood Insurance in New York City Following Hurricane Katrina, RAND, RR-328-NYC, 2013.
8 This goes beyond the mandatory offer requirement in current Department of Insurance regulations.
9 Property value will adjust to more stringent insurance requirements, so future owners should not be negatively affected.
Improvements on the Supply Side of the Market

For the supply side of the market to function properly, insurance premiums should approach the expected losses on each property, and insurers should possess enough financial capacity to provide coverage for the risk. Let me make a few comments on each of these issues.

Insurance Premiums. There is a tendency in private reinsurance markets for premiums on policies that cover high-consequence, low probability events to be substantially higher than the expected losses on the policy.10 These costs can cause premiums charged by the CEA to be higher than expected losses, and programs that enable the CEA to charge rates that approach the expected losses on its earthquake policies should be considered. For example, Senators Feinstein and Boxer have sponsored the Earthquake Insurance Affordability Act (EIAA), which provides a federal guarantee for bonds issued by the CEA following a major earthquake.11 The guarantee would lower CEA borrowing costs and allow it to save money on the purchase of private reinsurance, which it could then pass on to consumers in the form of lower premiums.12

Ultimately, the appropriate balance between private reinsurance and post-event federally guaranteed bonds depends on the price at which reinsurance is available in the private market relative to expected loss. It also depends on the costs of the bonds and how bond repayments are financed. However, my larger point is that it makes sense for California to explore financing mechanisms, such as that contained in the EIAA, that would enable earthquake premiums to better reflect expected loss on the policy.

Efforts should also be made to enhance the ability of the private market to offer catastrophe insurance at prices that approach expected loss. For example, allowing the tax-free accumulation of surplus for catastrophic risks merits consideration.

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10 Research has suggested the wedge between reinsurance prices and expected loss can be substantial (see for example Howard Kunreuther and Erwann Michel-Kerjan, At War with the Weather, MIT Press, 2009, p. 160 and David Chernick and David Appel, “PROTECTINGAMERICA.ORG: More Protection at Lower Cost for Consumers, A Detailed Analysis of Premium Savings for Consumers,” Milliman, June 5,2013). The CEA’s 2011 rate filing also shows a substantial risk premium. The CEA paid $227,201 for reinsurance and put estimated recoveries at $33,602—a ratio of 6.8 (“Prior Approval Rate Application,” The California Earthquake Authority, February 24, 2011, Exhibit 12). However, better public information on how reinsurance prices and the price of alternative risk transfer instruments (such as catastrophe bonds) for California earthquake risk compare to expected loss is needed.


12 It would also provide a reliable source of post-event funding in periods when financial markets can be unstable.
Insurance Capacity. Now let’s turn to capacity issues. The CEA has accumulated over $4 billion in capital and, once reinsurance and other sources of funds are considered, could pay roughly $10 billion in claims.13 This is impressive, but with full take-up, the losses from potential quakes are so large that they may be beyond the ability of one state to manage.

Today, the CEA and the private insurers collect roughly $900 million annually in residential earthquake premiums at 10 percent take-up.14 If take-up rose to relatively high levels (say 80 percent), premium revenue would be many times higher. Such a premium base would build up a surplus that could cover substantial events. For example, it seems plausible that the California insurance system with high-take up could cover a repeat of the 1994 Northridge earthquake, particularly if paired with some of federal loan guarantee program to finance a shortfall in claims paying ability after an event.15

But larger earthquakes are possible as are multiple quakes over a relatively short period of time.16 Even if the loans were federally guaranteed, the loan financing costs for very large events may be ill-advised at a time when the state is attempting to recover from a major disaster or set of disasters. It thus makes sense to explore mechanisms that can pool risks across the nation as a whole. Premiums should still be based on actual risk in any such program, so there would be no escaping the need for Californians to pay rates that recognize the risks of living in earthquake country. However, the premium base would be larger, reducing the potential for large borrowing costs. Proposals have been made for various risk-pooling schemes at the national level but have not seen sufficient support in Washington to move forward. However, a multi-layer risk sharing approach that includes the private insurers and state and federal government should be considered.

Thank you again for the opportunity to testify at this hearing.

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13 Annual Report to the Legislature and Insurance Commissioner on CEA Program Operations: Report Covering Calendar Year 2012, California Earthquake Authority, August 2013.
14 CEA and the non-participating insurers collected $0.920 billion in 2012 on 1.120 million earthquake policies. Average annual premium was thus $821 (Annual Report to the Legislature and Insurance Commissioner on CEA Program Operations: Report Covering Calendar Year 2012, California Earthquake Authority, August 2013).
15 The residential, direct economic losses from the Northridge earthquake are estimated to be approximately $33 billion in 2014 dollars. This figure includes both insured and uninsured losses (William Petak and Shirin Elahi, The Northridge Earthquake, USA and its Economic and Social Impacts, 2000).
16 Risk Management Solutions, for example, estimates that a repeat of the 1868 Hayward earthquake would result in between $50 and $100 billion in residential losses today (“Living in Earthquake Country,” Risk Management Solutions, http://www.rms.com/blog/2013/10/21/living-in-earthquake-country/ , accessed May 9, 2014).