

California State Senate

SENATE COMMITTEE ON INSURANCE

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Informational Hearing

CALIFORNIA EARTHQUAKE PREPAREDNESS: Risks to Businesses and the Economy

Summary

A major earthquake in the San Francisco Bay Area or in southern California could have an even greater impact on businesses, employees, and payrolls in the area than Hurricane Katrina had in Louisiana and Mississippi. In fact, according to the Bureau of Labor Statistics Monthly Labor Review in 2007, the exposures in Alameda County from a magnitude-6.9 earthquake on the Hayward Fault would be much greater than Katrina—the country's worst natural disaster in history—including 20 percent more businesses, 22 percent more employees, and 74 percent more in payroll earnings.

There hasn't been another major earthquake event since the Northridge earthquake in 1994, but California is almost certain to experience a similar disaster, or worse, in the next 30 years. While more than 30% of homeowners had earthquake coverage in 1994, it is now significantly more expensive and today only about 11% do. Only 8.3% of businesses today have earthquake coverage, according to the California Department of Insurance (CDI). Those numbers may be higher in the highest risk areas.

Insurance is the primary mechanism to spread losses and rapidly pay defined amounts for the repair of earthquake damage. It is essential for the economic recovery of individuals, families, businesses and communities. Unless property or business owners take action before a disaster to protect themselves by mitigating or transferring some of the risk, they--or as many hope, the government--will bear the brunt of earthquake losses.

The purpose of this hearing is to hear from experts on the risks faced by businesses, the workers' compensation system, and state and local

governments whose revenue would be affected by a prolonged interruption of economic activity; hear from the insurance industry on the state of the commercial earthquake insurance market; examine how prepared California businesses are for a major earthquake; and determine what can be done to maximize the level of insured risk prior to a major earthquake event.

The Committee will be examining the current state of the residential insurance market, and whether homeowners are adequately insured against catastrophic risk, including earthquake and the threat of major fires as a result of California's record drought, in a subsequent hearing.

Background

The magnitude 6.7 Northridge earthquake in 1994 was the costliest natural disaster in the history of California, and the fourth largest economic loss caused by a natural disaster in the nation's history. It caused over \$25 billion in damage, and \$49 billion in economic losses to the region and state. Seven major freeway bridges in the area collapsed, and 212 bridges were damaged, disrupting traffic in the Ventura-Los Angeles region for weeks following the earthquake. Communication, water and power distribution systems were affected and several fires started. At least 50% of small businesses were still not open nine months after the disaster.

The magnitude 6.9 1989 Loma Prieta earthquake, with an epicenter more than 50 miles from downtown San Francisco, caused only about \$6 billion in damage throughout the Bay Area. If a major earthquake like the one that hit San Francisco in 1906 happened today, however, it is projected to cause more than \$100 billion in damage.

Prior to the Northridge earthquake, insurers dramatically underestimated the potential damage from such moderate earthquakes, and many found themselves dangerously overexposed to earthquake risk. One major insurance company was driven to near insolvency. Insurance rating agencies took note of this increased exposure and downgraded many companies. As a result, insurers didn't want to touch California's homeowners' insurance market anymore because California required all insurers offering homeowners' insurance in the state to also offer earthquake insurance. The only way for a company to reduce its earthquake exposure was to seriously restrict the sale of new policies, or to stop writing earthquake insurance entirely. This led to the creation in 1996 of the California Earthquake Authority (CEA). The CEA only offers residential earthquake insurance, however.

Macroeconomic Impact of a Major Earthquake

The low frequency of earthquake events, compared to other natural catastrophes, tends to shape the perception that earthquake risk is much lower than it actually is, even in places where there have been very deadly and damaging occurrences, like California.

Japan's March 11, 2011, earthquake and the tsunamis it generated made the event the most expensive earthquake on record, with economic losses of \$210 billion, only \$35 billion of which was insured loss. That earthquake raised increased awareness of the economic challenges of recovery beyond the prevailing concerns for protecting human lives and property to protecting economic interests. Three years later it continues to impact domestic and multi-national business operations and has had long term economic consequences such as loss of market share, higher unemployment, and loss of business entirely.

The 2012 earthquake in Christchurch, New Zealand devastated the central business district, but more than \$12 billion of the \$15 billion in property damage from that quake was insured loss. According to the British unit of brokerage and risk management firm Marsh LLC, the New Zealand quake had \$23 billion in total economic losses and \$15.6 billion in insured losses, including life. New Zealand had a relatively high percentage of insured losses in that event as a result of its government-run Earthquake Commission which provides natural disaster insurance up to \$100,000 NZD for residential property. Although homeowners pay an insurance premium, the amount is capped and placed in a Natural Disaster Fund. Any coverage beyond that provided by the Commission is paid through private insurance. Since 1994, the program has covered not only damage caused by earthquakes but also floods, tsunamis, landslides, volcanic eruptions and hydrothermal activity.

Risk Management Solutions (RMS) evaluated the potential impact of a repeat of the 1906 San Francisco earthquake for the 100th anniversary of the earthquake in 2006. They estimated a total economic loss of \$260 billion. In addition, RMS estimated that an M 7.0 earthquake rupturing the southern and northern Hayward Fault would cause \$210 to \$235 billion in total damage and an M 6.8 earthquake rupturing the southern Hayward Fault (a repeat of the 1868 earthquake) would lead to \$112 to \$122 billion total damage.

If left inadequately prepared, disasters of similar severity paired with our low level of insured risk could cripple California's economy, and impact global business operations for a prolonged amount of time.

What is at Stake for California Businesses and the Economy

The major economic losses of a major earthquake fall into four categories: building damages, non-structural damages, damage to lifelines and infrastructure, and fire losses. Of those, only fire is a covered loss under most standard non-earthquake insurance policies, whether homeowners' or commercial. Some losses will be covered by other insurance, however, such as damage to automobiles covered under standard auto insurance policies.

In addition to physical damage, an earthquake will result in significant damage to the local and statewide economy. There will be wage and job losses resulting in higher unemployment and workers compensation claims, loss of taxable sales, loss of travel and tourism—particularly important to California, and general economic disruption.

The magnitude 7.8 southern California ShakeOut earthquake modelled by the United States Geological Survey (USGS) and USC's Southern California Earthquake Center in 2008 was projected to cause about 1,800 deaths and \$213 billion of economic losses. According to the authors of that report, the numbers are as low as they are because of aggressive retrofitting programs that have increased the seismic resistance of buildings, highways and lifelines, and economic resiliency. The numbers are as large as they are because much more retrofitting could still be done. The largest component of that loss is \$96 billion in business interruption costs, including \$50 billion as a result of lack of water.

The seven southern California counties that would be most affected by the ShakeOut earthquake are home to 621,000 business establishments, 6.3 million employees, and an annual payroll of \$303.3 billion, according to data from the Quarterly Census of Employment and Wages published by the U.S. Bureau of Labor Statistics (BLS) in 2011. The study showed that roughly 430,000 businesses and 4.5 million employees would be affected in the hardest-hit zones. The ShakeOut study also shows how such an earthquake could bog down the national economy. The seven hard-hit counties account for roughly 1 out of every 15 workers in the U.S. and the nationwide toll on unemployment and lost productivity could be severe.

The definition of a recession is two consecutive calendar quarters of negative economic growth. The earthquake in the Shakeout scenario would cause this for the Los Angeles region. A higher standard is that the majority of U.S. recessions since World War II have been characterized by a 2% decline in economic output. The \$96.2 billion gross output loss is a 6% loss in relation to Total Gross Output of the region and still well over 2.0% if we consider the longer period of impacts, a small proportion of which will linger past a single year. Of course, some sectors, such as construction and its major suppliers will gain, while others will lose from this process. Even a 6% decline in employment represents employment for a couple of hundred thousand people in the eight-county region.

"The overall health of our community after the event would depend on how well all of our businesses are able to respond," said Lucy Jones, a seismologist at the USGS whose work mapping earthquake scenarios buttressed the report.

A major earthquake could impact every aspect of a business' operations, including the interdependence with suppliers and access to customers. Beyond their direct losses in stock (such as buildings, machines, and inventory), many businesses will be unable to function because of loss of electricity, gas, water, and transportation systems. In the modern economy, the loss of communications is likely to pose a significant challenge. Some losses may be short-lived or recaptured when the business resumes, but the amount recaptured decreases with time as customers and suppliers find alternatives.

- **Physical Damage to Facilities and Critical Services:**

Electricity, water and telecommunications are the key to many business operations and resumption of business cannot occur without them. A major portion of projected business interruption losses come from lack of access to

water. Closures due to infrastructure damage, building issues, and/or equipment issues, may occur. A lengthy waiting period before an assessment of damages can occur prevents businesses from re-opening quickly. Build-back standards may hinder reconstruction efforts of businesses as they try to re-open their facilities. According to a major global commercial broker, there are often challenges for businesses with damaged premises, especially where larger numbers of buildings are involved, and/or there were delays in locating and quantifying the full scope of damage. Businesses that may have survived with little or moderate damage may be hindered from reopening if a building in close proximity to them has been more seriously damaged, or “red-tagged.”

- **Workforce Availability:**

Communities must have basics in order to return to work. If these are not met, population flight occurs and blighted areas become a new or exacerbated problem. Employees must have secure housing, including access to water and electricity, prior to returning to work. Schools and daycares must be available. There is a potential loss of workforce to long-term displacement or voluntary relocations.

- **Business Operations:**

Transportation interruptions and disruptions to suppliers limit the availability of goods and services necessary for production of business, which negatively impacts production capabilities. Reduced productivity and slowed or broken distribution lines could reduce delivery services to the client, and could mean loss of market share. Large plants out of production decrease availability of products for consumers. Loss of market share and customer base due to slow re-entry and customer replacement of services could hinder long-term viability.

Large businesses are more likely to recover given their resources and size. They may have other locations, have the ability to access funds to absorb a short term closure, or be able to relocate to a new location. However, when they do fail, these same large businesses leave a much larger negative impact on the surrounding community in terms of high job losses, indirect losses to suppliers, impacts to tax revenue, blighted areas, and general quality of life and community services.

Small businesses face an even bigger challenge. Even a short period without cash flow can significantly damage a small business as they have limited reserve funds. Smaller businesses are more likely to have inadequate insurance coverage for business interruption or repairs. In fact, the committee has spoken with one insurance broker serving small businesses in San Francisco who estimated that fewer than five percent of small businesses in San Francisco have earthquake insurance. Smaller profit margins due to their small size means there will be a larger impact when loss of revenue happens, even short term, and a downward spiral of bad credit, exhausted savings, and taking on additional debt often occurs when small businesses do try to re-open. In addition, they often do not get priority due to their size, and face delays when funding is made available after disasters. In addition, they are more likely to have only one location, meaning complete closure when damage occurs.

According to Community Action Plan for Seismic Safety (CAPSS) project of the San Francisco Department of Building Inspection, firms with 25 or fewer employees make up over 90 percent of the City's businesses and face the highest failure risk after an earthquake. Maintaining neighborhood business operations and speeding recovery are key to avoiding blighted neighborhoods. Vacant storefronts mean that both property values and neighborhood livability decline. San Francisco expects short and medium term declines in property tax, business tax, hotel room tax, sales tax, and other income sources. Federal funds will cover a fraction of the City government's rebuilding and recovery expenses, but none of its lost income.

Building owners bear the costs of repairs, as well as other costs, such as costs to relocate while damage is being repaired. Commercial owners lose income from rents. Existing lenders continue to expect payments. Owners' ability to repair their buildings depends on their ability to continue making payments on existing debt and to fund repairs from savings, liquidating other assets, or borrowing additional sums. Those without sufficient assets and with limited income might not qualify for additional loans. Part of the answer to these scenarios is pre-event mitigation, but mitigation cannot address all the risks or impacts.

The Commercial Earthquake Insurance Market

Unlike in the homeowners' market, there is no mandate to offer commercial earthquake insurance in the state, and no requirement that agents and brokers actually discuss earthquake insurance with their commercial clients. Commercial earthquake insurance is generally available, although cost and high deductibles are a significant barrier, particularly for small businesses. The cost is based on a number of factors, including the property's location, age, type of construction, and value. Commercial policies can also insure against damage to stocks and inventories, and loss of business—or business interruption.

For the insurers, the art of insuring natural catastrophes generally follows a strategy of limiting the potential insured loss in each location where an earthquake is likely to occur. For instance, the CDI has divided the state into eight earthquake zones (Zones A-H). Assuming that the damage effects of any earthquake in one zone cannot extend into another zone, an insurer could limit the number of earthquake policies to an equal number in each zone. In that way, an earthquake could affect at most only one-eighth of the policies at one time.

In addition to spreading the earthquake policies geographically and limiting the possible insured loss from any one earthquake, an insurer can look for a risk taker, a reinsurer. For instance, one insurance company might insure a \$100 million commercial building for earthquake damage and then make a contract with nine reinsurers to insure \$10 million of that building each. In the event of a damaging earthquake, the insurance company and each of the reinsurers would pay only one-tenth of the loss each. Using reinsurance is a common way of making a risk more insurable.

Probable maximum loss is an estimate of the largest loss a company might incur from the coverage of a specific commercial property, or for a portfolio of properties in the largest probable event. Because every insurance company has a specific amount of financial resources, insurance managers need measures to quantify the potential loss that the company might sustain from a catastrophic event. An insurer's capacity is the maximum amount of exposure, or possible losses, that an insurer is willing to accept. This capacity is a business decision that a company makes to insure a certain return for its policyholders (in a mutual company) or a stock value and dividend rate (in a stockholding company).

The Threat to Workers' Compensation and Unemployment Insurance

Although there has been very little historical loss experience from workers' compensation due to earthquakes, the September 11, 2001 terrorist attacks drove home the message that workers' compensation is exposed to catastrophic losses much larger than what historical experience shows. A report from Risk Management Solutions, a risk modeling company, showed that a repeat of the San Francisco Earthquake of 1906 today would incur workers' compensation losses of \$11.5 billion to \$35.8 billion, exceeding the losses from the 9/11 World Trade Center disaster.

Insurers have had few tools available for managing their exposure for massive workers compensation losses from a mega-catastrophe event. Unlike property insurers, the workers' compensation line does not have a history of catastrophe exposure management for disasters. The State Compensation Insurance Fund (SCIF), with approximately 11%-12% of the California workers' compensation market, has estimated its potential exposure to a repeat of the 1906 San Francisco or a major southern San Andreas earthquake could reach approximately \$500 million to \$750 million per event, depending on the time of day the earthquake hits. For example, because the Northridge earthquake hit at 4:30 am when few people were at work, there were very few claims for workers' compensation. If a major earthquake hits during peak work hours, the losses would be significantly higher.

According to a 2011 study by the Workers' Compensation Insurance Rating Bureau of California (WCIRB), workers' compensation insurers need \$180 million annually to pay for the risk of losses induced by earthquakes. The report, which was conducted by risk modeling company EQECAT for WCIRB, indicated that the losses would affect the approximately 15.57 million employees working during a major earthquake.

SCIF in 2011 established a first of its kind catastrophe bond program aimed at hedging its earthquake risk. The initial bond of \$200 million covered specified earthquake risks from December, 2011-December 31, 2014, and SCIF is now considering whether to renew that bond beyond 2014.

At the end of 2013, the state's deficit to the federal unemployment fund was \$9.7 billion. Much as the recent recession caused a dramatic increase in unemployment claims in California, a major earthquake would also drive a surge in unemployment claims, some

likely to be long lasting as the region seeks to rebuild, and many jobs may be permanently lost as businesses either fail or move out of the region.

Is National--or State--Catastrophe Insurance the Answer?

California, New Zealand, Japan and many other countries have set up programs to ensure that homeowners can obtain earthquake insurance, but none of these programs cover commercial policies. In France, the government created a program in 1982 to pay for uninsurable disasters such as floods. It is funded through a tax on nonlife (home, auto and commercial) insurance premiums. Insurance companies can obtain reinsurance for catastrophes from the government owned Caisse Central de Reassurance. The Netherlands set up a natural disasters program based on the French system after widespread, devastating flooding in 1994.

Natural disasters have become a growing and increasingly expensive problem all around the country, including flooding, hurricanes, tornados, earthquakes, wildfires and drought. The seeming increasing frequency of major natural disasters, including Hurricanes Katrina and Rita --the costliest natural disasters in U.S. history--has prompted calls for some form of national catastrophe insurance protection. The Northridge earthquake in 1994 ranks number 4, at \$12.5 billion in insured property losses. The World Trade Center and Pentagon terrorist attacks in 2001 rank third. Hurricane Katrina caused more than \$41 billion in private insured losses, according to the Insurance Information Institute. Disaster losses are expected to escalate in the coming years, in part because of increases in development along the nation's coasts. According to one catastrophe modeling company, catastrophe losses will double every decade due to growing residential and commercial density and more expensive buildings.

The principal difference between Hurricane Katrina and a future Hayward Fault earthquake involves the role of catastrophe insurance in funding reconstruction and recovery. Following Hurricane Katrina in 2005, a total of \$70 billion in insurance payments—53% of the economic loss— including payouts from the National Flood Insurance Program (NFIP), were made to residents and businesses to help rebuild and recover in coastal Louisiana and Mississippi. In contrast, only between 6% and 10% of the total residential losses and between 15% and 20% of the commercial losses of a major Hayward Fault earthquake are expected to be reimbursed by insurance¹. Overall, insurance payments will cover between 10% and 14% of the total loss—and total between \$12 and \$30 billion.

Currently, the only national disaster insurance is provided through the National Flood Insurance Program (NFIP), part of the Federal Emergency Management Agency. Flood, like earthquake coverage, is generally excluded under homeowners' policies and many commercial property policies. The NFIP makes federally-backed flood insurance available to homeowners, renters, and business owners in exchange for state and community floodplain management regulations that reduce future flood damages. Much

¹ Although fewer businesses carry earthquake insurance, those policies are higher value and are likely to result in larger payouts.

like CEA policies, NFIP policies are sold through private insurers who issue the policies and adjust claims. NFIP also requires Federal agencies and federally insured or regulated lenders to require flood insurance on all grants and loans for acquisition or construction of buildings in designated special flood hazard areas, referred to as the Mandatory Flood Insurance Purchase Requirement. Special flood hazard areas are those within a floodplain subject to a 1 percent chance of flooding in any given year, commonly referred to as the 100-year flood. Even with the mandatory purchase requirement, nationally only 40 to 60 percent of those who are required to purchase flood insurance actually have policies in force. Only about 1 percent of homeowners outside the 100 year flood zone purchase flood insurance.

There is no similar federal mandate that federally insured or regulated lenders require earthquake insurance in earthquake risk zones. Such decisions are left entirely to the property owner, with resulting low take-up rates. There has been some commentary that the next major earthquake in California will result in a financial crisis, rather than an insurance crisis, as property owners walk away from highly leveraged properties rather than bearing the cost of repair or rebuilding in addition to paying the existing mortgage or debt. Such a proposition might have seemed highly speculative prior to the recent recession, but during the mortgage crisis thousands of California property owners did walk away from their properties, leaving whole communities devastated and banks, including many community banks, taking significant losses.

To date, the private market has shown little interest in taking on more natural catastrophe exposure for residential or commercial risks. High premiums and big deductibles discourage most property or business owners from voluntarily purchasing such coverage. Without some kind of government backing or participation to spread the risk prior to such an event, recovery will take longer and ultimately cost more for all taxpayers.