CALIFORNIA EARTHQUAKE INSURANCE AND MORAL HAZARD

SPENCE GLOTZBACH

ABSTRACT

THE RECENT SEISMIC ACTIVITY HAS LED MANY POLICY MAKERS AND ECONOMISTS TO QUESTION (1) TO WHAT EXTENT WILL PROPERTY LOSSES IN CALIFORNIA, IN THE EVENT OF A CATASTROPHIC EARTHQUAKE, BE SHARED BETWEEN HOMEOWNERS, INSURANCE COMPANIES, AND GOVERNMENT ENTITIES? (2) WHAT INEFFICIENCIES EXIST IN THE CURRENT SYSTEM WHICH LEAD TO MORAL HAZARD? (3) WHICH POLICIES AND REGULATIONS ARE CURRENTLY IN PLACE, AND ARE THEY ACTING IN AN EFFICIENT MANNER?

AFTER A BRIEF INTRODUCTION, PART I PROVIDES AN OVERVIEW OF THE ECONOMICS OF REGULATING THE EARTHQUAKE INSURANCE MARKET IN CALIFORNIA, FROM A COASEAN PERSPECTIVE. PART II OF THIS PAPER DISCUSSES THE CURRENT CATASTROPHE INSURANCE POLICIES, WITHIN THE STATE OF CALIFORNIA. PART III ANALYZES VARYING HOMEOWNER INCENTIVES, AND THE MORAL HAZARD DILEMMA, AS RELATED TO INSURING AGAINST CATASTROPHIC LOSS. THIS PAPER LOOKS AT POTENTIAL DEMAND AND SUPPLY SIDE CONSIDERATIONS CURRENTLY AFFECTING THE EARTHQUAKE INSURANCE MARKET. THE PAPER CLOSES WITH ADDITIONAL ANALYSIS AND RECOMMENDATIONS WHICH COULD HELP REDUCE AND/OR ALLEVIATE THE CURRENT ECONOMIC INEFFICIENCIES WHICH ARE CURRENTLY PRESENT IN CALIFORNIA INSURANCE MARKETS.

INTRODUCTION

Natural disasters threaten nearly all regions, of every country, in the world. Although this risk of catastrophic property loss exists, only roughly a third of all potential victims have purchased first-party catastrophe insurance.[1] The scope and range of destruction can vary widely as many natural forces (such as floods, draughts, tropical cyclones, hurricanes, and earthquakes) are able to cause an immense amount of damage. With this potential risk comes the necessity for property owners to hedge against potential loss, or at a minimum fully understand the personal risk they are taking by not becoming properly insured.

In late 2009 and early 2010 seismic activity in the Western Hemisphere has increased. Many policy makers have thus begun to question who bears the property loss risk in the event of a catastrophic earthquake. In January of 1994, the Northridge Earthquake, with a magnitude of 6.7, caused an approximate $20 billion property loss when it struck the San Fernando Valley, about 20 miles northwest of Los Angeles.[2] In February of 2010, an earthquake, with a magnitude of 8.8, struck off the coast of the Maule Region of Chile. If a similar earthquake were to strike in or around San Francisco, homeowners, insurance

[1] *See* Michael Faure and Veronique Bruggeman, *Catastrophic Risks and First-Party Insurance*, 15 Conn. Ins. L.J. 1 (2008) [hereinafter Faure, *Catastrophic Risks and First-Party Insurance*].

[2] NISEE. Pacific Earthquake Engineering Research (PEER) Center. University of California, Berkeley. *available at* http://nisee.berkeley.edu/northridge/. (2005). Last accessed 4/11/2010

companies, and government entities could face a total property loss potentially $100 billion or more.[3]

The possibility of large financial losses, related to property damage from earthquakes, has led many public policy professionals to question (1) to what extent will property losses in California in the event of a catastrophic earthquake be shared between homeowners, insurance companies, and government entities? (2) what inefficiencies exist in the current system which lead to moral hazard? (3) which policies and regulations are currently in place, and are they necessarily acting in an efficient manner?

Homeowners have an economic interest to manage personal risk by hedging against an uncertain loss. Earthquake property insurance is a financial instrument in which homeowners pay a premium to an insurance institution, over a period of time, to protect the policyholder in the event an earthquake causes damage or loss to his or her property. Throughout the United States, and more specifically in California, standard homeowner insurance policies do not cover damage caused by earthquakes. Therefore, the homeowner is left with the question of whether or not to purchase additional insurance, protecting against the risk of damage caused by an earthquake.[4] Currently in California, homeowner earthquake insurance policies have very high premiums and relatively high deductibles.[5] Within the United States, there are approximately 5,000 incidents of seismic activity per

---

[3] *See Earthquakes: Risk and Insurance Issues*, Insurance Information Institute (2010). *available at* http://www.iii.org/Issue_Updates/Eathquakes-Risk-and-Insuance-Issues.html Last accessed 4/25/2010. [hereinafter Insurance Information Institute, *Earthquakes: Risk and Insurance Issues*].

[4] *See* Insurance Information Institute *Earthquakes: Risk and Insurance Issues, supra* note 3 (2010).

[5] *Id.*

year.[6] Since 1900, damage in some capacity has occurred in all 50 states.[7] California is considered to have the greatest risk for property loss related to earthquakes. However, it has been approximated that only 12% of homeowners in California actually have earthquake insurance protecting their homes.[8]

In April 2008, experts from the U.S. Geological Survey, USC's Southern California Earthquake Center, and the State Geological Survey, concluded that the state of California will inevitably experience a major earthquake by 2028.[9] Researchers found that there is a ninety-seven percent probability that southern California will be hit by an earthquake equal or greater to the 1994 Northridge quake.[10] This raises the question of why California homeowners are not protecting their property interest by purchasing earthquake insurance.

The actions, or rather lack of action, by homeowners and the policy relating to the spreading of risk relating to property loss caused by earthquakes will be the primary concentration of this paper. Accordingly, it will analyze reasons why homeowners are not buying first-party earthquake insurance, and are therefore not currently accepting responsibility for the risk of property loss while living in a region prone to earthquakes. Furthermore, this paper will make policy suggestions which should be considered as a new system which will more efficiently allocate the risk of earthquake property loss to those who choose to live in high risk areas. This change is necessary because homeowners continue to

---

[6] *Id.*

[7] *See Earthquakes: Risk and Insurance Issues*, Insurance Information Institute (2010). *available at* http://www.iii.org/Issue_Updates/Eathquakes-Risk-and-Insuance-Issues.html Last accessed 4/25/2010.

[8] *Id.*

[9] *See* Insurance Information Institute *Earthquakes: Risk and Insurance Issues, supra* note 3 (2010).

[10] *Id.*

live and move to high risk areas of California while the property loss burden is placed on government entities and therefore disinterested taxpayers.

This analysis will take an overarching look at the incentives affecting the earthquake property insurance market in California. Part I provides a brief look at the economics of regulating the earthquake insurance market in California from a Coasean perspective. Part II provides a brief background of the current earthquake property loss policies currently in place in California. Part III analyzes varying homeowner incentives and the moral hazard dilemma, as related to insuring against catastrophic loss. This paper looks at potential demand and supply side considerations currently affecting the earthquake insurance market. The current property loss policy, resulting from catastrophic earthquakes within California, is resulting in higher premiums for homeowners. Therefore, fewer homeowners are acquiring the optional earthquake insurance, leaving them exposed to the potential for large property losses and dependency on government entities.

Part IV provides recommendations for courses of action needing to be taken in order to ensure that California homeowners are adequately insured in the event of a catastrophic earthquake. The recommendations attempt to provide a more economically efficient solution without completely shifting this burden onto unaffected individuals. Although the timing of catastrophes, caused by environmental factors, cannot be completely predicted, the risk of financial loss can be spread over a period of time. This paper also suggests the creation of a state-backed insurance company dealing specifically with property losses caused by catastrophic environmental events, as well as an adequately funded federal catastrophe fund. A policy should be implemented mandating the purchasing of earthquake

insurance from either a state certified insurance provider, or the newly created state backed insurance company.

PART I – THE ECONOMICS OF EARTHQUAKE REGULATION – THE COASE THEOREM

In the event of a catastrophe, caused by an earthquake, someone or some entity will have to bear the financial loss created by the natural disaster. If a homeowner is under the assumption that a government entity will cover this loss, and therefore chooses not purchase adequate insurance, the government entity and taxpayers could end up bearing the burden of the externality. The spreading of risk through insurance is considered to be a socially beneficial activity because not every insured individual suffers a property loss in the event of a catastrophic loss. Evaluating the law, from an economic perspective, would thus prompt two questions:[11]

- What is the optimal level of earthquake insurance?
- How can the law provide incentives to comply with the optimal level?

In his article "The Problem of Social Cost," Coase illustrates that if transaction costs are zero, optimal allocation of resources will always take place, regardless of the content of the governing legal rule.[12] The critical question then becomes which of the involved parties (homeowners, insurance companies, and government entities) should be mitigating or bearing the risk of a catastrophe. It is possible for the homeowner to mitigate or bear this risk by either purchasing adequate earthquake insurance or accepting a financial property

[11] Faure, Michael G., *Environmental Liability* (2009). Tort Law and Economics, Edward Elgar, ed., 247-286, Cheltenham, 250. Available at SSRN: http://ssrn.com/abstract=1503405 [hereinafter Faure, *Environmental Liability*]

[12] *See*. R.H. Coase, *The Problem of Social Cost*, 3 J.L. & Econ. 1 (1960).

loss. However, it is far more difficult for government entities to provide mitigation for potential property loss.

Since harm is not being caused directly by the homeowners, but instead by a natural disaster which is unpredictable, the homeowners are choosing not to mitigate or insure their risk.[13] Therefore, they are pushing the risk onto the system, by not purchasing adequate earthquake insurance. Under the Coase theorem, if the proper conditions are met, an adequate amount of earthquake insurance will be purchased, regardless of what the legal rules are.[14] Given that the assumption of zero transaction costs holds true, the homeowners, insurance companies, and government entities will get together and negotiate with one another to ensure that the risk is sufficiently spread amongst the parties.[15] The low cost provider will end up bearing the majority of the risk as the other parties will pay the low cost provider a premium to bear the risk. However, this theorem may break down if one of the parties is acting strategically based on an assumption that one of the other parties will pay for the loss regardless.[16] It is suspected that "at risk" California homeowners are currently acting in the aforementioned fashion due to the likelihood that government entities will fold to political pressures in the event of a catastrophe and pay for the loss.

Although there is a likely possibility that the cost of the catastrophe will be placed on either homeowners, insurance companies, or a government entity, there is a distributional

---

[13] Faure, *Environmental Liability, supra* note 11, at 251 (2009).

[14] *Id.*

[15] Faure, Michael G., *Environmental Liability* (2009). Tort Law and Economics, Edward Elgar, ed., 247-286, Cheltenham, 250. Available at SSRN: http://ssrn.com/abstract=1503405

[16] *Id.*

difference. From the government entities' or taxpayers' perspective, the legal rules will matter as these parties are likely to be bearing the current risk of potential loss. The government entities and taxpayer potentially bear these risks, yet are not choosing to live in these high risk locations. This distributional difference may influence, from a policy perspective, the legislators to intervene and ensure that homeowners are purchasing an adequate level of earthquake insurance to cover the loss of their property, even in the situations where the conditions of the Coase theorem were fulfilled.[17]

PART II – CURRENT CATASTROPHE INSURANCE POLICY IN CALIFORNIA

"First-party insurance is a system whereby insurance coverage is provided and compensation is awarded directly by the insurer to the victim."[18] Housing insurance is a very common and specific type of property insurance. However in many states, including California, basic housing insurance policies exclude the coverage of damages caused by natural disasters.[19] Therefore, it becomes necessary for homeowners in disaster-prone areas to decide whether it is in their best interest to purchase separate insurance policies to cover the risks associated with specific natural disaster losses. First-party catastrophe property insurance, such as earthquake insurance, is a contract between a property owner and a policy issuer, or insurance company, which states if a property loss occurs, which is caused by a certain type of catastrophe, compensation will be awarded directly by the insurer to the

[17] *See* Faure, Michael G., *Environmental Liability* (2009). Tort Law and Economics, Edward Elgar, ed., 247-286, Cheltenham, 251. Available at SSRN: http://ssrn.com/abstract=1503405

[18] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 3 (2008).

[19] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 4 (2008).

victim.[20] In the United States there are additional government agencies and polices, which tend to be created in haste after a devastating catastrophe takes place. The aforementioned provide financial aid in the event of a natural disaster; however, these entities resources are limited. The resources of the government agencies are provided through taxation, which includes funds paid by taxpayers who choose to not live in at-risk areas. Therefore, the majority of their aid goes to individuals who do not possess catastrophe insurance.

In response to the devastating earthquake which struck Northridge, California in 1994 the California Earthquake Authority ("CEA") was created.[21] The CEA has previously stated that their organization was created "in order to avoid debilitating the homeowners' insurance market and to keep earthquake insurance available at affordable prices."[22] It is fair to state that this agency is not fulfilling its mission as only twelve percent of California homeowners possess earthquake insurance. Current California law requires insurers to offer earthquake insurance with every homeowner's policy.[23] The California Insurance Code states:

> "No policy of residential property insurance may be issued or delivered or, with respect to policies in effect on the effective date of this chapter, initially renewed in this state by any insurer unless the named insured is offered coverage for loss or damage caused by the peril of earthquake as provided in this chapter. That coverage may be provided in the policy of residential property insurance itself, either by specific policy provision or endorsement, or in a separate policy or certificate of insurance which specifically provides coverage for loss or damage caused by the peril of earthquake alone or in combination with other perils."[24]

---

[20] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 3 (2008).

[21] *See* Jose S. Penalva Zuasti, *Insuring California Earthquakes and the Role for Catastrophe Bonds*, Universitat Pompeu Fabra, 1, 2 (2001). [hereinafter Zuasti, *Insuring California Earthquakes and the Role of Catastrophe Bonds*].

[22] *Id.*

[23] *Id.*

[24] 8.5 Cal. Ins. §10081 (1984).

This additional requirement has resulted in many insurance companies choosing one of two paths regarding the offering of homeowner policies in California. Most insurance companies choose to no longer offer homeowners' insurance in the state of California. Those who continue to offer earthquake insurance require very high premiums and deductibles. In addition to private insurance companies, the CEA also offers first-party earthquake insurance. [25] However, in 1994, in response to the Northridge Earthquake, thirty percent of households had an earthquake insurance policy, but by 2002 only seventeen percent had earthquake insurance.[26] This illustrates that "once the memory of the disaster is forgotten, a large quantity of the new insurance coverages" lapse, or are cancelled.[27]

Currently, the insurance companies still offering earthquake insurance in California create insurance contracts where the insurer "will pay the holder of the contract conditional on the individual's home being damaged by an earthquake."[28] The typical term for these insurance contracts, protecting against damage, caused by earthquakes, is yearly.[29] Under the current system in California, there are also a limited number of reinsurance providers available to help hedge first-party earthquake insurance provider's risk. This inability to reduce risk, on the part of the first-party earthquake insurance providers, increases the cost of premiums and limits the number of offerings for homeowners.

In the current legal and political environment in California, homeowners are not required to purchase earthquake insurance unless they believe it is necessary. This paper will further

[25] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 6 (2008).

[26] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 7 (2008).

[27] *Id.*

[28] *See* Zuasti, *Insuring California Earthquakes and the Role of Catastrophe Bonds, supra* note 16, at 30 (2001).

[29] *Id.*

analyze whether homeowners are acting in a rational fashion when they choose to forgo purchasing additional insurance, to protect their property, in the event of an earthquake.

PART III – HOMEOWNER'S INCENTIVES AND MORAL HAZARD

As of 2001, there are 5,876,707 households which live in areas considered to be at risk for seismic activity. 1,400,706 households live in areas considered high risk.[30] The majority of the high risk households are found in the San Francisco Bay area or in the Los Angeles Basin.[31] As of 2008, the median house value in San Francisco Bay area was $824,300. [32] Also in 2008, the high risk earthquake loss city of Los Angeles had a median home value of $574,300.[33] In 2008, the median house value in the United States was $232,100.[34] Not only is there a high probability of seismic activity in these areas, but the elevated home prices could lead to an enormous amount of property damage. It has been estimated that the historic San Francisco Earthquake of 1906 would have caused losses of $96 billion if the earthquake had occurred during the current economic and demographic conditions.[35] Given the high probability of an earthquake in these cities, and the relatively high home values, one would assume that the homeowners would be protecting their investments by purchasing earthquake insurance. Yet it is estimated that only twelve percent of homeowners in the state of California possess earthquake insurance. This raises

---

[30] *See* Zuasti, *Insuring California Earthquakes and the Role of Catastrophe Bonds*, *supra* note 16, at 14 (2001).

[31] *Id.*

[32] *See* City-Data.com, San Francisco, California City Report, http://www.city-data.com/city/San-Francisco-California.html (last visited Apr. 16, 2010).

[33] *See* City-Data.com, Los Angeles, California City Report, http://www.city-data.com/city/Los-Angeles-California.html (last visited Apr. 16, 2010).

[34] *See* U.S. Census Bureau, *Median and Average Sales Prices of New Homes Sold in United States*, available at www.census.gov/const/uspriceann.pdf (last visited Apr. 16, 2010).

[35] *See* Insurance Information Institute *Earthquakes: Risk and Insurance Issues*, *supra* note 3 (2010).

the question of whether homeowners are acting rationally, or taking excessive risk regarding property loss.

Policy makers and economists need to determine whether there is currently a demand for first-party catastrophe insurance in the state of California. Additionally, they need to determine whether insurance is a proper mechanism to spread risk amongst the affected citizens of California. Homeowners are assumed to behave as if they have engaged in a detailed analysis of the costs and benefits associated with the purchase of an insurance policy.[36] "Whether potential victims need insurance for losses resulting from a particular catastrophe will to a large extend depend on whether they can rely on other sources, such as government, to provide compensation."[37] Under the current system in California, and on the federal level, it is believed that the victims of a catastrophe will be provided assistance. However, bailouts after the fact may be more costly then homeowners purchasing insurance, and having the insurance companies purchase federally backed reinsurance. Therefore, the reinsurance pool could be funded gradually over time instead of in the haste post catastrophe.

Under the current regulatory system in California many homeowners do not purchase earthquake insurance because the premiums on the policies are considered to be too expensive, the deductibles are too high, the purchase is not mandatory, and there is a belief that the state and federal government will help out in a time of crisis. Under the current system, earthquake insurance typically carries a deductible which is the form of a

[36] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 5 (2008).

[37] *Id.*

percentage, rather than a fixed dollar amount.[38] Earthquake insurance deductibles typically range anywhere from two percent to twenty percent of the replacement value of the structure.[39] This large cash requirement places an immense burden on the policy holder, who just sustained a loss due to the catastrophe. In many instances, California homeowners are unaware of the risks they currently are not protected against. Instead homeowners only look at the large cash infusion which will be necessary to pay their deductible and realize they will be unable to pay this amount in the event of a disaster. A $900,000 home in San Francisco could have a deductible as high as $180,000. Under the current regulatory system in California, it may be tough for homeowners to understand what losses they will ultimately be compensated for, in the event of an earthquake, which fall outside of the assistance to be provided by the state and federal government.

Traditional law and economics literature start with the underlying assumption that human beings act in a rational fashion.[40] Under the current property loss policies relating to catastrophes, homeowners in California arguably are acting rationally by not purchasing earthquake insurance. However, this may be due to misinformation and a belief that they will be compensated one hundred percent for the loss of their properties. This individualistic behavior, and lack of risk avoidance, comes with excessive externalities being imposed on the remaining taxpayers in the state of California and citizens of the United States. In the event of a catastrophic property loss, some individual or entity will have to shoulder the loss and will therefore bear the financial risk under the current

[38] *See* Insurance Information Institute, *Earthquakes: Risk and Insurance Issues, supra* note 3 (2010).

[39] *Id.*

[40] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 3 (2008).

regulatory scheme. It appears that the said current regulatory scheme, which limits the number of insurance providers, coupled with the belief of government intervention in the event of a disaster by homeowners, is leading to a moral hazard dilemma.

The moral hazard dilemma explains a market failure when individuals do not buy insurance, and are instead willing to take an excessive risk. Moral hazard occurs when an individual or company, who is protected from risk, or in the case of California homeowners believe to be protected from risk, chooses to act in a different manner than if they were entirely exposed to this risk. Moral hazard occurs when there is a "failure of the insured to take cost-justified precautions once he has shifted the risk."[41] It is likely that many homeowners in California believe that if an earthquake does strike, the damage will be so immense the federal government will bail them out, regardless the amount of their individual loss.[42] Although this may be true to some degree, it is likely that the government will not be able to fully reimburse all property owners for their entire losses, and perhaps not bail out any, who chose to not have adequate protection. In some instances, insurance could be made mandatory, where there is a high likelihood of loss. Without a mechanism to make insurance mandatory, costs may continue to be subsidized by the government and tax payers which do not choose to live in the risk-prone regions. Homeowners therefore need incentives to buy earthquake insurance. It is likely that government entities will be willing to bear some of the cost to help make the premiums more affordable for homeowners since

---

[41] *See generally* David D. Friendman, *Law's Order*, Princeton University Press, Pg. 66 (2000).

[42] Richard Lempert, *Low Probability/High Consequence Events: Dilemmas of Damage Compensation* (April 1, 2009). U of Michigan Law & Economics, Olin Working Paper No. 09-005, 15. Available at SSRN: http://ssrn.com/abstract=1371784 [hereinafter Lempert, *Low Probability/High Consequence Events*]

these government entities are currently bearing the risk of the potential losses.[43] Based on a Coasean approach, the federal government should be willing to provide incentives to homeowners to buy earthquake insurance and help mitigate potential losses. However, this additional subsidy may incentivize homeowners to continue to live in these high risk areas, therefore adding to the already present moral hazard. The requirement of earthquake insurance would act like taxation for the homeowners who choose to live in these extraordinarily risky locations, while also providing the assurance that their property will be replaced in the event of a catastrophe. "Taxes might be levied on those who choose to build … on earthquake prone land, both to discourage such choices and to establish funds that can compensate for the harms that will arise when the known risk is realized."[44]

Under the current system, there appears to be a reliance by homeowners on the premise that the state or federal government will provide ex post disaster assistance, regardless of whether the party holds insurance coverage.[45] "If victims could count on state-provided ex post compensation after disasters, then their incentives to purchase first-party insurance coverage may be diminished."[46] Furthermore, the federal government may find it difficult to resist the political pressure which comes with not providing assistance in times of catastrophe. Although no current definitive empirical evidence to substantiate this theory,

[43] *Id.*

[44] *Id* at 16.

[45] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 9 (2008).

[46] *Id.*

there appears to be some relationship, tenuous or not, between the government providing compensation and the willingness of potential victims to obtain insurance coverage.[47]

Individuals are assumed to act in a manner which will maximize the expected utility of wealth, be adverse to risk, and be able to affect the probability of loss by taking care.[48] Under the current regulations, homeowners appear to be acting rationally. However, the system in place appears to be inefficient. The system is currently inefficient because the homeowners taking the additional risk are not bearing the cost of a potential catastrophic event. Instead the current system would lead to cost of the catastrophe spreading to all citizens who pay taxes regardless of whether they are the ones choosing to live in the risk-prone regions. However, an improvement on the current system, "such as mandate[ing] earthquake [insurance], can, by increasing the up-front costs of taking risks, discourage unjustified risk taking behavior."[49]

If earthquake insurance is going to be made mandatory for homeowners in risk-prone areas of California, the insurance will need to be affordable. Therefore, some supply side considerations must be analyzed as well. There are three main reasons some insurance companies choose not to issue catastrophe insurance which include: a fear of extreme financial loss in the event of a catastrophe, uncertainty of the degree of risk, and the lack of reinsurance capacity.[50]

---

[47] *Id.*

[48] Steven Shavell, *On Moral Hazard and Insurance*, The Quarterly Journal of Economics, Vol. 93, No. 4. The MIT Press, 541-562, 543 (Nov. 1979).

[49] *See* Lempert, *Low Probability/High Consequence Events, supra* note 37, at 16 (2009).

[50] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 10 (2008).

History has shown that when disasters of catastrophic proportion take place "a significant number of insurance companies become insolvent as a result of such catastrophic losses."[51] Insurance companies therefore tend to avoid areas which are prone to catastrophic losses, in order to keep their company in a viable financial state. Secondly, there is a lack of accurate predictability regarding the frequency and magnitude of natural disasters. Although insurance companies have the ability to charge increased risk premiums, this rate increase is usually met by a decreased demand for insurance. In some situations legislation is put into place which limits premiums that can be charged for catastrophic risk insurance as well as additional regulation, which limits the insurer's ability to offer actuarially sound earthquake policies.[52] Thirdly, insurance companies need to have sufficient financial reserves or the ability to raise capital in the event of catastrophic losses. Typically, insurance companies will attempt to acquire reinsurance to solve their capacity problem. However, reinsurance is not always available at a price which will allow the first-party insurance company to remain profitable if there is not sufficient demand for catastrophe insurance by homeowners.[53]

In order to attract insurance companies willing to offer lower first-party earthquake insurance, reasonably priced reinsurance will need to be available to the insurers of first-party earthquake insurance. Government intervention may be the best mechanism to provide this reinsurance to the first-party earthquake insurance providers. If the federal government were to create a federally-backed reinsurance company, it is likely this entity

---

[51] *Id.*

[52] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 11 (2008).

[53] *Id.*

would be the low cost provider for reinsurance related to catastrophes. In the event of a qualifying catastrophe, this reinsurance company would be able to raise the necessary funds to repay insurance companies, by borrowing funds at the risk-free rate, or through taxation. Alternative reinsurance providers would be unable to raise capital at such a low rate. The creation of this federally-backed reinsurance provider would result in lower premiums being paid by homeowners, as the first-party insurance companies would be able to insure their own risk at a lower cost, therefore passing the savings to their consumers. Furthermore, the creation of a federally-backed reinsurance company would provide assurance to homeowners, which would now be required to purchase earthquake insurance, that sufficient funds would be available in the event of a catastrophe. Homeowners would be more included to feel comfortable purchasing affordable earthquake insurance knowing the funds would not be exhausted before full compensation is paid.[54]

The best example of misallocated risk associated with potential catastrophic natural disasters is that which homeowners, the state of Louisiana, and the Federal Government faced in the aftermath of Hurricane Katrina.[55] Homeowners in the state of California are taking similar risks of property loss, although their specific catastrophe will likely be caused by earthquakes, as the risk which homeowners in the state of Louisiana accepted regarding hurricanes. Homeowners in California are currently more underinsured in regards to earthquakes than homeowners in Louisiana were regarding hurricanes in 2005.

---

[54] *Id.*

[55] *See* John K. Warrant, *Restoring Responsibility and Accountability in Disaster Relief*, 31 Wm. & Mary Envtl. L. & Pol'y Rev. 893, 900-901 (2007).

During the aftermath of Hurricane Katrina the realization was made that the private insurance industry, as well as the federal government, were inadequately prepared to deal with a catastrophe of such a magnitude. It has been estimated that only approximately $40 billion, of the estimated $130 billion cost of Katrina, will be covered by private insurance.[56] The net difference of approximately $90 billion will be shouldered by homeowners themselves or as a bailout by the federal government. Many government programs currently in place, such as the Superfund, have considerable budgetary constraints. This therefore shifts the additional costs of the catastrophe on federal taxpayers, regardless of whether they were directly affected by the catastrophe.[57]

In order to reduce the likelihood that resources of the federal government will be necessary in the event of a future catastrophe similar in financial loss to Katrina, first-party property loss insurers need to be incentivized to issue earthquake insurance with lower premiums. The creation of a federally-backed reinsurance company would properly incentivize private insurers to infuse new capital into the California market. Although there would still be some actuarial risk for the insurers, the insurance company would be less likely forced to shoulder an extensive financial loss, due to a natural disaster.

PART IV – ANALYSIS AND RECOMMENDATIONS FOR FUTURE ACTION

A difficult task is at hand. It is very difficult to create policy which will alleviate the moral hazard problem created by the current notion that the federal agencies will provide assistance in the event of a catastrophic event. However, it is believed that some of the

[56] *See* John K. Warrant, *Restoring Responsibility and Accountability in Disaster Relief*, 31 Wm. & Mary Envtl. L. & Pol'y Rev. 893, 900-901 (2007).

[57] *Id.*

potential financial externalities, created by homeowners not purchasing earthquake insurance, can be alleviated if earthquake insurance became required by all homeowners in California. The mandatory earthquake insurance should be actuarially grounded, based on the risk the individual homeowner is taking. Therefore, policyholders will only be charged for the hazard that he or she faces.[58] This mandatory earthquake insurance would create a system where homeowners who choose to live in seismic-prone areas would not be able to push their risk upon the remaining citizens who choose not to live in these high risk areas.

The proposed scheme will need to include a firm commitment by the federal government to create a federally-backed reinsurance company and general catastrophe fund. This reinsurance company will be the best mechanism to obtain funds in the event of a catastrophe. In the creation of the federally-backed reinsurance company, it will be essential for actuarial rates of the reinsurance to be appropriately set to ensure the reinsurance company does not become overextended and undercapitalized, in the event of multiple catastrophes occurring in the same year. Additionally, a bipartisan, Congressionally-appointed panel of economists and policy makers should help determine the proper capitalization for the reinsurance company to acquire and maintain. This proper capitalization will provide assurance to first-party insurance companies that their claims will paid as well as assure federal taxpayers that a minimal amount of federal funding will be needed in the event of a catastrophe.

Furthermore, insurance companies issuing insurance policies relating to natural catastrophes (such as earthquakes, hurricanes, tornados, and blizzards) will be the

[58] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 15 (2008).

companies acting as the consumer of reinsurance policies. The federally-backed reinsurance company will spread the risk of property loss between many different regions of the United States. It is likely that the newly established federally backed reinsurance company will be able to offer the lowest reinsurance premiums to first-party insurance providers because the pool of funds will grow quite large as the insurance companies pay their premiums. The catastrophic events, which the federally-backed reinsurance company will be providing coverage for, will have very low, if not non-existent, correlation. When the wind blows hard enough in Florida to cause $100 billion in property damage, it is highly unlikely that the ground will shake hard enough in California to cause $100 billion in property damage in the same year. In the event that multiple catastrophes do happen in the United States within a short time frame, the federally-backed reinsurance company would have the ability to raise funds at a lower cost than current reinsurance companies. The newly created federally-backed reinsurance company would have significant advantages of raising low cost capital, by being able to borrow at the risk free rate, as a government entity, and also the federal government has the ability to tax to raise necessary funds. This reinsurance company would provide greater security to first-party insurance providers which, in the event of multiple catastrophes, their reinsurance policies would be paid in full because the reinsurance company would be adequately funded.

If first-party catastrophe insurance were to be made mandatory, primarily in high risk areas, it would remove pressure on government entities to provide disaster relief.[59] This first-party catastrophe insurance would somewhat guarantee that victims themselves would

[59] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 17 (2008).

be paying for the compensation they received after a disaster took place.[60] Mandatory catastrophe insurance would also be able to provide additional benefits to homeowners that government entities may not be able to supply. The additional benefits could include risk mitigation incentives prior to disaster by offering premium reductions or lower future deductibles if certain actions are taken by homeowners to prevent significant loss; yet, the insurance companies would still be able to provide adequate protection when the catastrophe actually takes place.[61]

In the wake of the increasing seismic activity across the world, legislators within the state of California, and at the federal level, need to implement a plan which will place the risk of catastrophic loss on the shoulders of those choosing to take this risk. Legislators would be wise to consider the lessons learned in the aftermath of Hurricane Katrina as to how to be better prepared for catastrophic losses as opposed to being forced to react with great haste and a superfluous amount of federal aid, once insurance companies begin to become insolvent. The implementation of the aforementioned ideas would create a two-fold benefit as there would be a pool of resources to pay for catastrophic losses and these resources would be funded by those taking the risk, not disinterested taxpayers.

---

[60] *See* Faure, *Catastrophic Risks and First-Party Insurance, supra* note 1, at 17 (2008).

[61] *Id.*