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Rumi Kumazawa '94
Illinois Wesleyan University

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Problems with Earthquake Insurance in Japan

Abstract

This paper discusses the significant complexities of providing insurance for natural disasters.

Keywords

natural disasters, uninsurable risks

About the author : Rumi Kumazawa '94, a math major from Japan, wanted to make her choice of topic for her insurance class a truly distinctive one. Hailing from Japan, she turned to her background for a truly interesting subject. Her immediate plans are to enter the insurance field, possibly as an actuary, since she particularly likes the use of math in a business environment.

PROBLEMS WITH EARTHQUAKE INSURANCE IN JAPAN

Rumi Kumazawa

Although insurance companies generally provide coverage for insurable risks, they also provide some limited protection for uninsurable risks, too, such as natural disasters including earthquakes and floods. Natural disasters are considered uninsurable risks because the probability of a loss occurring cannot be calculated, and losses also tend to be catastrophic. In order to make earthquake insurance available to those who wish to have it despite its relatively high cost, insurance companies are reinsured so that the risk is transferred to others. Japanese insurers are faced with problems because the country is located in the area most likely to be hit by a major earthquake in the world. Also, reinsurers in the U.S. and Britain are becoming more reluctant to provide insurance since many fear that a major earthquake in Tokyo is imminent, and that the amount of losses in Tokyo would be greater than that from any other known natural disaster in the world.

The exact probability of a big earthquake occurring in Japan cannot be calculated, but it is believed to be relatively high compared to that in other countries. This is because Japan is in an area known as the "Circum-Pacific seismic zone, the belt in which 80% of the world's earthquakes occur (Karter, p.21)," and it lies above the contact point of four tectonic plates. Seismologists predict that a major earthquake will hit Japan within the next thirty years around the Tokai area west of Tokyo. According to their data, no significantly big earthquake has struck this area for about a hundred and forty years now, and they are assuming this risk since no other area in Japan has gone this long without a relatively big quake.

Insurance companies believe that Japan will suffer greatest losses if a quake hits Tokyo, its largest city, since "more than 60% of the nation's major companies are headquartered in Tokyo. Together with the three neighboring prefectures likely to be devastated by a quake, the city accounts for about 30% of Japan's nominal gross national product (Rubinstein, p.77)." The event Japanese insurers fear most is lack of a substantial amount of coverage. Reinsurers overseas are becoming less willing to

provide protection, fearing that they themselves would go bankrupt in assisting with payments. Tokyo Bank estimates that total losses could be much greater than the combined losses from catastrophes which occurred recently, including "the \$3 billion October 1987 windstorm in Southeast England and northwest Europe; the \$1.4 billion Piper Alpha North Sea oil platform fire...; Hurricane Hugo; the California earthquake; and explosion of a Philips Petroleum Co. petrochemical plant (McIlwaine, p.16)."

Japanese insurers and their reinsurers are assuming many other risks associated with a big quake, which might add to the damages already caused by an earthquake. For instance, the risks of liquefaction and huge tidal waves are assumed since their effects have been noted in other big earthquakes in the past. Liquefaction is a phenomenon in which sand and water in the soil separate, causing tall buildings to collapse or sink deeply into the ground. This effect was seen in the Great Kanto Earthquake of Japan in 1923, as well as in the more recent earthquakes in San Francisco and the Philippines. Damages by "tsunami" or huge tidal waves is another risk assumed by insurers because Japan is surrounded entirely by water. This effect could clearly be seen in the Hokkaido earthquake in northern Japan this year in July. Before people could recover from the shock of the immense quake which measured 7.8 on the Richter Scale, a thirty-foot "tsunami" hit the island causing yet further damages to the already devastated area. Besides these risks, damages from man-made disasters could occur, too, such as tremendous explosions of gas lines, oil spills, numerous fires, etc.

For the Japanese insurance companies, providing enough coverage for losses resulting from earthquakes is a serious problem since an earthquake, after all, is an uninsurable risk. Insurance companies only provide protection through reinsurance - a method used to transfer the risk to another insurer in a different area so that a catastrophic loss would not make the insurer bankrupt in paying out claims. A series of catastrophic losses caused by natural disasters in the recent past "are forcing reinsurers worldwide to boost their catastrophe reinsurance rates (Shapiro, p.64)." Japanese insurers cannot help but accept the high premium rates for reinsurance because otherwise, they will be risking more losses than they are capable of handling.

The main difficulty in insuring earthquakes or any other natural disaster is that insurers are not certain if premium rates are too high or too low. Risk managers are debating whether rates should be increased or not, and one view is that rates should be increased since "the insurance industry has to be allowed to generate reserves for the increasing number of natural disaster losses (McIlwaine, p.18)" that are occurring worldwide. An opposing view is held by Japanese consumers who feel that since earthquake insurance is only offered as an endorsement to fire insurance policies, if the rates are so high, then it is best not to purchase it at all. An underwriter of the Marine & Fire Insurance Association suggests, "Earthquake insurance is a

big headache (because) if it is sold only in earthquake areas, we can't make ends meet, so we are trying to sell it nationwide. If we could make it compulsory, we could get some balance (Rubinstein, p.77)."

Another problem with earthquake insurance, from the point of view of the Japanese insurers, is that reinsurers are increasing rates by far too much. Especially after the big Hokkaido earthquakes in January and July, reinsurers are becoming more risk averse. One underwriter "predicted that premiums would climb as much as 200% for earthquake reinsurance (Shapiro, 64)" by the end of this year because too many people are convinced that the next catastrophic loss could be a huge Tokyo earthquake. Increasing reinsurance rates will no doubt drive insurance rates up, too, so that fewer people may choose to purchase earthquake insurance. Reinsurers even feel that catastrophic losses could lead to a world recession since "about half of all Japanese funds invested annually in the United States would be diverted to rebuild the Tokyo area, with devastating effects on U.S. stock and bond prices and interest rates" (Rubinstein, p.77).

I think that the problems with earthquake insurance can be solved if better ways to assess and evaluate the risk are developed, not just on a national level, but on a global scale. Because of the significant role reinsurance plays in earthquake insurance, it is important that countries get together to discuss the problem so that equal rates can be established. Right now, Japan is at a disadvantage because it is located in an area where most of the earthquakes in the world occur, and reinsurers are raising premiums by a vast amount. Japanese insurers cannot object to this since they desperately need the extra protection reinsurers can provide so that a significant part of the risk is transferred to reinsurers abroad.

I think that CRESTA - Catastrophic Risk Evaluating and Standardising Target Accumulations - an organization which was formed as a result of the earthquakes in Nicaragua and Guatemala in the 1970's, has made a good start in trying to achieve these goals. Only about forty European and Latin American insurers and reinsurers are members so far, but the main objectives of this organization are to provide each other with detailed information on past earthquakes and losses, and to come up with possible future losses, so that they can be assessed more accurately.

Another solution to the problem of earthquake insurance may be an improved method for creating adequate funds to cover all losses. I think that if the Japanese insurance industry can somehow provide earthquake insurance at a much cheaper cost, then more people will want to purchase it, thus creating a bigger capacity. One of the reasons for the high cost of earthquake insurance is that unlike property/casualty insurers in the U.S. and U.K., Japanese insurers "underwrite as one peril the exposure of both direct and indirect damages that are caused by primary and secondary disasters (Karter, p.21)," instead of separating each one. If they change their underwriting system and consider each exposure as a different peril, then coverage may be obtained

at a relatively lower cost since different areas may want different types of coverage. For example, the risk of tidal waves will not be present in a landlocked area, so coverage for it should not be included.

Finally, areas exposed to the risk of a major earthquake should take more precautions to try and reduce the risk of additional losses. For instance, if improved methods for constructing tall buildings on reclaimed land are developed, then the chance of these building sinking or collapsing due to liquefaction may be decreased. Also, if chemical plants, oil refineries, etc. are improved with more safety equipment, then the risk of fire and other hazards may be reduced. So, even though the risk of an earthquake itself cannot be reduced, losses from subsequent disasters may be reduced or may even be prevented.

Therefore, although it sounds like a contradiction, insurance companies do provide insurance for uninsurable risks, too. One of the reasons why insurers can do this is because of reinsurance. In the case of earthquake insurance in Japan, many insurers overseas have agreed to reinsure the Japanese against catastrophic losses. However, without a uniform standard of assessing and evaluating losses with more accuracy, the present earthquake insurance cannot be said to be a fair or effective system. Japanese insurers and their reinsurers may have to reduce the cost of earthquake insurance in order to make it more affordable, and create more capacity to cover for losses. The risk of a major earthquake cannot be reduced, but the extent of losses from subsequent disasters can be controlled. As Mr. Munkhammar, vice president of Skandia International Corporation in Sweden, explains, "Not until we are able to measure the risk reasonably well, to rate the risk reasonably well and to create the necessary funds, will there be enough capacity available and will the earthquake peril become truly insurable (Hofmann, p.24)."

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