SEAN McALLISTER AND ELIZABETH COHEN

Japanese Casualty Insurers Show Resilience

A large-scale natural disaster of the magnitude of the March 11 Tōhoku earthquake can devastate a nation's insurance industry. While the total economic losses are substantial, the Japanese insurance industry is expected to withstand this catastrophic event without significant financial impairment, according to Fitch Ratings. How is this possible?

Survivors float lanterns on the Kitakami River for earthquake and tsunami victims.

YOMIURI SHIMBUN / AP IMAGES

A close look at residential earthquake insurance coverage in Japan reveals two systems that are polar opposites in terms of how they insure and reinsure earthquake exposure. Despite their differences, the systems achieve similar results that enable them to compensate claimants while maintaining solvency.

Residential Risks

Private Non-Life Insurance Carriers

Earthquake insurance provided by private non-life insurance carriers is available only as an optional endorsement to Japanese fire insurance policies. Coverage for earthquake losses is available at policy limits of 30 percent to 50 percent of the fire insurance limit, subject to maximum limits of ¥50 million ($616,000) per house and ¥10 million ($123,000) for personal property.

Settlements for residential or personal property losses occur at three levels: total loss (provides 100 percent of policy limit), half loss (provides 50 percent of the policy limit), and partial loss (provides 5 percent of the policy limit).

Rates for earthquake insurance consist of a risk premium rate, which covers expected future claims, plus a load for expenses and commissions. The risk premium rate varies according to the dwelling's geographic location and construction (wooden or non-wooden).

Even though earthquake insurance is not-for-profit, Japan's considerable exposure to earthquakes keeps rates high. Earthquake insurance penetration rates have increased in recent years, but fewer than 50 percent of residential insurance consumers purchase an earthquake endorsement, according to the Non-Life Rating Organization of Japan.

Cooperative Insurance Carriers

As an alternative, insurance consumers in Japan can obtain residential earthquake insurance from one of Japan's cooperative insurers. These insurers conduct insurance operations on behalf of Japan's cooperative societies, which engage in business and other activities to improve the standards of living of society members.

The largest of these cooperative insurers, with approximately 85 percent of the total cooperative insurer fire insurance premium, is the National Mutual Insurance Federation of Agricultural Cooperatives (Zenkyoren). Zenkyoren, like other cooperative insurance carriers, operates on a nonprofit basis and offers insurance products that differ from those of the private carriers.

Zenkyoren's residential earthquake exposure comes primarily from its building endowment policy. Unlike the annual fire insurance policies issued by private insurers, the building endowment policy covers insureds for five years or longer and automatically covers residential buildings and personal property from damages caused by fire, flood, earthquakes, and other disasters. Coverage also is provided if the policyholder or a family member is killed or injured in a natural disaster. In addition to covering losses caused by disasters, the building endowment policy may provide policyholders with a partial refund of premium that can be used to pay for essential home repairs, such as repairing a leaking roof or deteriorating windows.

Given the comprehensive coverage of the building endowment policy, the premiums charged are greater than the expected losses to the residence and personal property. In this regard, the building endowment policy can be thought of as a long-term savings policy that provides funding for essential home repairs, whether caused by a natural disaster or natural wear and tear. If the policy expires without the policyholder claiming a total loss, the policyholder is entitled to a partial refund of the premium.

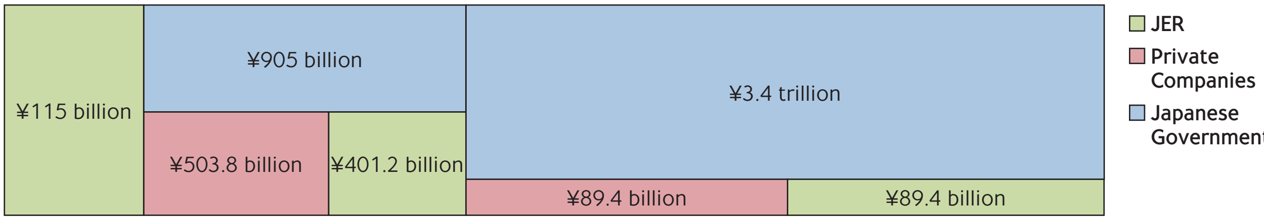
Unlike the separate earthquake endorsement premiums charged by private carriers, the earthquake component of the building endowment rate is not segregated from the total rate and does not vary by location.

Reinsurance Protection

Private Non-Life Insurance Carriers

Based on the 1966 Law Concerning Earthquake Insurance, private carriers writing earthquake insurance cede 100 percent of the earthquake premium and liabilities to the Japanese Earthquake Reinsurance Company (JER), the sole earthquake reinsurer for private carriers. The JER retains a portion of the liability and cedes the remainder of the liability

FIGURE 1. Japanese Earthquake Reinsurance Scheme for Residential Exposures



Source: Authors

FIGURE 2. Maximum Liability of Residential Earthquake Insurers

Insurer	Maximum Liability	Percent of Total
JER	¥605.60 billion	11.0
Private carriers	¥593.15 billion	10.8
Japanese government	¥4,301.25 billion	78.2
Total	**¥5,500.00 billion**	**100.0**

Source: Annual Report 2010, Japan Earthquake Reinsurance Co., Ltd.

to the private insurance companies and the Japanese government based on the total insured losses. The reinsurance program is illustrated in Figure 1.

To maintain the financial stability of the private carriers, the total of all insured loss payments for each earthquake is capped at ¥5.5 trillion ($67.8 billion). If the total insured losses exceed this amount, all claim payments are prorated. This system results in delays in preliminary loss estimates as individual carriers' insured losses are not known until total insured losses are known.

Given a maximum insured earthquake loss of ¥5.5 trillion ($67.8 billion), the private carriers, the JER, and the Japanese government can determine their maximum liability for any occurrence. The maximum liability per participant is shown in Figure 2.

As illustrated in Figure 1, the Japanese government retains a larger share of the total liability as the total insured losses increase. Government participation is central to this system, which is based on a belief that natural disasters such as the Tōhoku earthquake, no matter where they occur, have a national impact.

Cooperative Insurance Carriers

The cooperative insurers are not within the scope of the Law Concerning Earthquake Insurance and do not participate in the national earthquake reinsurance system. This exemption provides cooperative insurers with much greater flexibility in their reinsurance program structure.

In stark contrast to the private carriers, which cede their earthquake exposure to the JER and the Japanese government, the cooperative insurers cede a significant portion of their liabilities to the international reinsurance market.

Zenkyoren is said to have one of the largest catastrophe reinsurance programs in the world, and its ceded losses from the Tōhoku earthquake will be considerable according to the *Insurance Insider*. Based on a preliminary loss estimate of ¥650 billion ($7.9 billion) from its building endowment policies, Zenkyoren is expected to cede ¥380 billion ($4.6 billion) to international reinsurers, or close to 60 percent of its loss, and retain ¥270 billion ($3.3 billion).

In addition to traditional reinsurance, Zenkyoren has spread its risk to the capital markets through the use of catastrophe (CAT) bonds. In May 2008, Munich Re issued Zenkyoren's second catastrophe bond, a $300 million issue through the special-purpose vehicle Muteki Ltd. The Muteki CAT bond, which expired on May 14, 2011, provided Munich Re with fully collateralized protection for Japanese earthquake exposure. Zenkyoren was the ultimate beneficiary of this arrangement through its reinsurance contract with Munich Re.

The Muteki CAT bond, like other CAT bonds that have covered earthquake risk in Japan, was triggered by the location and magnitude of an earthquake rather than the actual insured losses. Investors in this bond are expected to face a complete loss of the $300 million principal. According to a report by Oliver Suess that ran on the Bloomberg wire, this will make it the second CAT bond ever to result in a partial reduction of principal and the first to result in a complete loss.

Similar Outcomes

Whether earthquake insurance is provided by a private carrier or a cooperative insurer, the claim payments are not intended to provide a complete recovery to the insured. In both systems, the maximum claim payment is limited to 50 percent of the fire insurance limit, even if the dwelling is completely destroyed.

In addition to limiting their loss potential, both the private carriers and cooperatives effectively spread risk. Japanese private insurers pool their earthquake exposure and cede their liabilities to two domestic reinsurers—the JER and the Japanese government. The cooperative insurers spread risk through a sophisticated reinsurance program that cedes earthquake liabilities to international reinsurers and the capital markets. In both systems, the effective use of reinsurance limits the liability of any one company.

FIGURE 3. Residential Earthquake Insurance Risk Reserves as of March 31, 2010

Insurer	Maximum Liability
JER	¥496.7 billion
Private carriers	¥524.3 billion
Japanese government	¥1,270.8 billion
Total	**¥52,291.9 billion**

Source: Annual Report 2010, Japan Earthquake Reinsurance Co., Ltd.

FIGURE 4. 10 Largest Insurance Companies by Net Written Premium

Rank	Company	Country
1	Axa S.A.	France
2	Assicurazioni Generali SpA	Italy
3	Allianz SE	Germany
4	Japan Post Insurance Co. Ltd.	Japan
5	UnitedHealth Group	United States
6	American International Group Inc.	United States
7	National Mutual Insurance Federation of Agricultural Cooperatives	Japan
8	Munich Reinsurance Co.	Germany
9	WellPoint Inc.	United States
10	State Farm Group	United States

Source: A.M. Best

FIGURE 5. Comparison of Private Insurer and Cooperative Insurer Residential Earthquake Coverage

	Private Insurers	Cooperative Insurers
Company Status	For-profit	Nonprofit
Earthquake Coverage	Optional endorsement to residential fire insurance policy	Automatically included in building endowment policy
Reserves	Earthquake premium plus investment income less expenses	Long-term savings provides reserves for unforeseen natural disasters
Reinsurance	JER and Japanese government	International reinsurance market

At the same time, Japan's insurers, private and cooperative, are funded adequately for the Tōhoku earthquake. Unlike statutory and GAAP (generally accepted accounting principles) accounting in the United States, which do not allow for the establishment of a reserve for events that have not occurred, Japanese accounting laws allow for pre-event catastrophe reserves. This has ensured that funds are available to pay for damages stemming from the Tōhoku earthquake.

Japanese private insurance carriers retain 100 percent of the earthquake premiums received less expenses as a reserve for future earthquakes. Any underwriting gains and investment income are required to be set aside as additional reserves. The Japanese government maintains a separate government reserve for its share of the future liabilities.

The table in Figure 3 shows the earthquake risk reserves held by private carriers, the JER, and the Japanese government as of March 31, 2010. The reserves held by private carriers and the JER are over 80 percent of their maximum liability for a single earthquake occurrence—an amount considerably higher than the insured loss estimates for the Tōhoku quake.

Zenkyoren's building endowment policies enable it to accumulate substantial premium income. According to an A.M. Best ranking of international insurance companies, Zenkyoren ranked seventh in the world in terms of net written premium in 2009 (see the table in Figure 4). As with the private carriers' earthquake premium, most of Zenkyoren's premium income is set aside as liabilities to pay future claims.

Standing Strong

The earthquake insurance system in Japan illustrates that there are no one-size-fits-all catastrophe insurance programs. Within Japan, a nation with significant earthquake exposure, we see two vastly different catastrophe insurance systems at work. A comparison of these systems is provided in Figure 5.

Despite significant differences, both systems manage to limit exposure to losses through a combination of policy limits, loss limits, and reinsurance protection. Accounting standards that allow for reserves to accumulate over time provide the insurers with separate resources to pay claims. These similarities will enable both systems to fulfill their obligations to claimants without suffering financial impairment. □

SEAN McALLISTER, a fellow of the Casualty Actuarial Society and a member of the Academy, is a consulting actuary for Milliman in Wayne, Pa.

ELIZABETH COHEN, a fellow of the Casualty Actuarial Society and a member of the Academy, is a consulting actuary for Milliman in Chicago.

Resources

Japan Earthquake Reinsurance Co., Ltd., 2010 Annual Report

Japanese National Federation of Agricultural Cooperative Mutual Aid, April 28, 2011, press release

Nowakowski, Piotr, and Yuji Kawamura, "Earthquake Insurance System in Japan," *Regards* No. 8, December 2003, SCOR Japan. http://scor-front1.heb.fr.colt.net/www/fileadmin/uploads/publics/REGARDS_200312_08_en.pdf

Suess, Oliver, "Investors in Munich Re's Muteki Cat Bond May Face Loss on Japan," Bloomberg, April, 1, 2011. www.bloomberg.com/news/2011-04-01/investors-in-munich-re-s-muteki-cat-bond-may-face-loss-on-japan.html