

Financial Innovation and System Construction as Catastrophe Risk Responses

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1. Tracing to the beginnings to reduce the impact of catastrophes

China is a country with frequent disasters, with 70% of its cities suffering the attack of natural disasters like flood, typhoon, earthquake, etc. Those catastrophes have caused great financial losses that to an extreme extent encumbered the progress of economic growth and urbanization. However, rational risk management can reduce the impact of catastrophes from the very beginning.

People's Participation Reduces Catastrophe Risk at the Source

The management of catastrophe risk should draw people into decision-making. There are two reasons:

Firstly, the catastrophe problem is a disaster problem, and it is a regional issue. For instance, 85% to 90% of victims of an earthquake are saved by their close neighbors, whose participation have congenitally expedited the rescue; since people of the disaster area knows well about local circumstances, encouraging them to involve in the discussion of post-disaster problems and think beyond the single community will contribute to the reduction of catastrophe risks.

Secondly, it is important to distinguish clearly between the primary and secondary participation in risk management, and response to the rescue work in a top-down approach. It is also necessary to ensure the full public participation and motivate mutual interaction between inside and outside participants, based on the combination of government and the people.

2. Applying financial tools to response to catastrophe risks

In the process of dealing with catastrophes, catastrophe insurance has always been the traditional choice. During the practices, we have gradually probed a set of new approaches, developed new ideas, expanded new markets, utilized new methods, and exploited new channels. The detail is introduced as follow:

New approach: index insurance quantifies catastrophe risks

Introduction>>

In recent years, catastrophes happen frequently in China, causing serious economic losses that have slowed down economic growth and urbanization. To reduce the impact of catastrophes, on one hand we can take control from the source and introduce people to participate in decision-making; on the other hand, we can apply financial approaches.

Index insurance refers to using quantity computation to quantify the so-called coping strategies for reducing unnecessary costs. The primary advantage of this approach is that with index serving as a trigger point, it can reduce moral risks and adverse selection of traditional insurance. Besides, it doesn't require rapid compensate in accordance with actual losses within the first hours of the catastrophe. Until now, most design of catastrophe insurance system adopts index compensation mechanism.

In programming the index model, the first thing is to get rid of complicated factors so as to ensure the availability and integrity of the data. It allows us to analyze relevant information of natural disasters and the losses from an overall perspective. Thus we can gain a general knowledge of the distinguished vulnerability, disaster categories, ability and risk exposure of different areas when they face natural catastrophe.

Building a parametric insurance accounting system based on those data can not only convince people to add insurance to events with high risk probability, but also can relief the insurers from the burden of point-to-point loss assessment. They can just refer to relevant major parameters to verify the losses, which can raise the compensate efficiency. Unfortunately, parametric insurance is now of low applicability and its validity is strongly depending on previous data collection of a certain disaster and its target losses. In addition, the degree of relevance, parameter and correspondence is still under consideration and assessment.

New ideas: dispersing and layering the commercial insurance and securitization of catastrophes

Number one, the dispersal mechanism of commercial insurance aiming at catastrophes includes direct insurance, reinsurance and securitization of catastrophes. It is built on the basis of calculation, which require make an assessment according to losses of possible disasters in different areas across the whole country and make pilot projects.

Number two, the layered structure is a mature experience practiced by the international society for catastrophe insurance. Different layers have different functions, set up different proportion of risk distribution, and contract different triggering conditions.

Number three, catastrophe securitization severs as a new-type approach of risk diversification, through which capital flows to markets to take risks. It has three major stages: oversea establishing and issuing; oversea

establishing but domestic issuing; domestic establishing and issuing.

New market: insurance asset securitization helps catastrophe insurance to thrive

Our country has a multi-level capital market, including stock market (main board market and growth enterprise market), internal financial futures market, regional equity market, and private market. In the quotation system of private market, insurance companies are major participants. The quotation system has provided a valuable stage for insurance asset securitization,

Insurance companies can use their money in the quotation system in private market for investment in innovation (of products that related to catastrophe insurance securitization), for client agency, and for project display, etc.

Nowadays catastrophe insurance securitization in our country is gradually promoted. The SAC (Securities Association of China) has signed relevant agreements with Insurance Institute, and has established a special research team to design the next step to strengthen experiments and popularization.

New method: forward contract and capital financing of tax fund pool

Different countries suffer from different catastrophe risks which causes interactive changes to life risk. We can assume the different death rate based on this linkage change, and after observing the data we can conclude that there's an oriented correspondence among those death rates. As a result, we can use one country's death rate to speculate another ones. The specific financing operation are as follows: using the contract as a way to offset one's losses in one country by his earnings in another country, which equals to a forward contract that reverses the risk exposure and the actual situation and forms risk hedging.

Another financial approach is to build an available capital pool based on taxation. Insurance companies don't have to pay taxes at the end of every year. Instead, they can pay taxes when it comes to an end of a certain period or a contract term. When a catastrophe strikes in a long term like twenty years, the insurance should compensate, but if it happens within certain fixed critical point of death rate(like 0.9%) , then the company doesn't have to pay the tax.

New channel: Internet insurance scenarios push forward catastrophe

insurance

What's the definition of Internet+ catastrophe insurance? Government insurance and financial institutions use the Internet to complete organizational management of catastrophe protection and provide the whole people with products and information service related to catastrophe insurance——Internet+. Until now, our country has met all the requirements for Internet+, for instance, favorable Internet market, great attention, and mature development of the whole industry.

The basic framework of Internet+catastrophe insurance system mainly lies in using computer techniques like the big data, cloud computing, and information flow to encourage people to participate in solving the unsustainable development of government-undertaken mode under the traditional insurance system. It bonds government, private enterprises, and financial institute together to take part in new Internet system and commercial activities. It aims at protecting consumers.

In this mode, each of the five major participants is required to play their own roles. The first participant is the government. It should build the legal system; purchase catastrophe insurance products and establish catastrophe risk fund because of its double statuses as initiator and contributor; release plans for catastrophe risk diversification; and enact tax preference policies to arouse people's enthusiasm of participation. The second participant is commercial insurance institute. Its responsibility is to create relevant products and to apply insurance tools in risk diversification and protection. People are the third participants. They should voluntarily accept the government guide and take an active part in the plan of raising supplemental security amount and diversifying catastrophe risks. Or they can participate in the investment of catastrophe bond and stock products as individual investor. The forth participants are supporting financial institutions. They offer protection for catastrophe risks of middle, small and micro business. The last participant is the third-party platform, whose major duty is to maintain daily exchange platform.

The practice process has two major points. The first one is to ensure the mode of government leading and public participating. It has several steps. Firstly, the government leads the planning mode and guides to set up a fund for catastrophe risks. Secondly, the government releases some relevant policies that benefit the public and encourage people or social enterprises to take part in the risk dispersal mechanism. Thirdly, it is

advisable to build a daily operation system while referring to the type of system in insurance exchanges. Fourthly, to guarantee that each insured accident is able to get favorable coverage and people who have already get coverage have access to relevant compensation.

The second point is the pattern of market operation and market observation. Marketization means to accept social with the utmost transparency, set up information issuing platform, bid inviting platform and trade witnessing platform for catastrophe insurance. The ultimate goal is to establish fund releasing and retransaction platform and online disaster prevention platform.

1. Institutional Construction as a Way of Managing Catastrophe Risks

Refer to the risk prevention experiences of surrounding countries and regions and explore the way to build the catastrophe insurance system.

ASEAN way:

Goldman Sachs believes that reinsurance companies' business mode need immediate improvement for it is of extremely low reliability and is considered as sunset mode. Unless reinsurance companies effectively test their risk exposure, Goldman Sachs will not offer products and obligation related to reinsurance business.

Recently the ASEAN members are trying to establish a reliable, enduring conservation finance system to guarantee its economic growth. They are commonly short of sufficient capital, which means they can't obtain rational insurance premium from enterprises and consumers. Thailand is a typical case: the three largest insurance companies are reluctant to take the country's business or they would like to increase extravagant insurance premium. The Thai supervisor put forward the basic framework of ASEAN Community, which provided preferential condition and prices by investing in pre-disaster risks.

Catastrophe Management Development in South Korea: the Transition of a Case and a New System

South Korea is an agricultural country. It depends on family or communities' risk sharing while large insurance companies and capital markets also take part in. When a catastrophe comes, the government lays down a regulation and supervises on its execution and absorbs the consequent risks at the same time. However, the executive power of its

law is still weak.

Speaking of the sunken accident of SEWOL ferry, according to the contract, the insurance company had no responsibility and the final compensation should have been dominated by the government. However, considering social opinions, the Korean had to make the insurance pay for this accident.

Take the above-mentioned accident for example, it can be said that Korea has suffered from frequent accidents since the 1990s. One reason is that its modernization process has been extremely compressed; the other one is that the whole society is still tacitly approving and selectively ignoring catastrophe risks, which are usually called as non-boundary risks or dim-boundary risks. The probability of an accident multiplies by the expected loss is equal to the risk. The probability is always assumed greater than Zero, so if the expected loss is infinitely great, it will definitely cause a catastrophe.

The Koreans have weak consciousness about risks, and has no strict judicial rule and penalty system. Therefore after disasters, the Korean government set up new department to enhance education of disasters, and also used government financing and social investment to promote a catastrophe insurance management system. Although nature cannot be controlled, law, culture, economy and technique can affect people's knowledge attitude and behavior toward risks. Enhancing law, cultural, economic construction and elevating technical level enables the country to face disasters more effectively and to realize the sustainable result-oriented development of catastrophe insurance.

Experience from Taiwan Insurance Industry: talking from the response

Taking catastrophe insurance for example, the role of government is not limited to when the catastrophe strikes, and more important role of government is to help to make market regulations. From Taiwan's practical experience, insurance institutes usually put forth efforts in following respects:

Firstly, insurance companies analyze the losses and rate through cooperation with universities and research institutes. Secondly, they could cut down the clients' risks and control the companies' risk through some damage-prevention system with the idea of serving clients. Thirdly, to offer basic premium rate. The companies exploit risk rate by building an

assessment model of natural disaster. They also play an important role in guiding clients for risk management by product-design fee rate system. On the one hand, it lowers the price of premium rate; on the other hand, it applies the method of re-insuring to achieve risk transfer, using tools like ART and PPP.

Moreover, the countermeasure of catastrophe risk should be analyzed on three levels. First of all, general commercial insurance should be offered to individuals and companies, for the rate of purchasing individual catastrophe insurance is relatively low and the companies usually require risk management. Some countries and regions provide micro insurance aimed at natural disasters. For instance, Taiwan, Japan, New Zealand and Turkey all have established earthquake insurance funds; the U.S. has set up residence-flood prevention and reduction system, and Hawaii and Florida have established relevant funds; Thailand and France also have insurance system for natural disasters. Secondly, the great earthquake stroke Taiwan in 1999 caused economic losses at NT300 billion dollars, while only NT20 billion of the losses were insured by commercial insurance (company underwriting), which was a very low coverage. Besides, Taiwan adopts single premium rate for earthquake and the insurance against total loss only. However, since typhoon and flood risks have great regional differences, the popularization of single premium is not feasible. Thus parametric type of catastrophe bond is not suggested for its calculation errors), and the loss-compensation type is highly recommended. Thirdly, risk assessment model is in badly needs. The insurance center cooperates with universities for setting up assessment model of earthquake, typhoon and flood risks and offer referential premium rate for commercial insurance of natural disasters.

The Construction of Shanghai Finance and Insurance Center: the Establishment of Catastrophe Risk Protection System in China

Catastrophe risk has an important significance for China, therefore it is imperative to build catastrophe insurance system. Catastrophes influence causes great damages to one's personal life, directly and indirectly. As a consequence, it's of vital importance to set up catastrophe insurance system, which meets the requirement at national political and market level.

Traditional disaster management system in China has distinctive features. The history of development is decided by its administrative system:

distinguished forms of disaster management bring about distinctive government administration departments. When disasters come into being, the central government mobilizes the resources, while Ministries of Land and Resources, Water Resources, and the Seismological Bureau, Oceanic Administration, and Weather Bureau share the administrative authority. It underestimates the power of market, leaving them with less than 3% of responsibilities. The government exercises strict budget overlooks the institution-building, pays attention to post-disaster reconstruction but neglect management before disasters, salvation amid disasters, and insurance compensation after disasters. Vulnerability still exists in its risk prevention system.

There are three significant benefits of building finance and insurance center in Shanghai:

1. The construction of catastrophe system plays an important role on the development of insurance industry.
2. Shanghai has a special status in China. It was proposed to building shanghai as international insurance center in 2014, one of whose supporting points is establishing catastrophe insurance center. Thus the securitization of catastrophe risks is required to be foundation. As the financial center of China, Shanghai has a fully developed factor market, which is an apparent advantage. And based on this ground, it can use tools of catastrophe risk securitization to allocate risks between capital market and investors.
3. The development of catastrophe insurance requires a complete exterior legal environment to ravel out referred subjects and interest relationship. We should start from the top-down design, specify rights and obligations of all parts and realize the long-term, stable operation of this system.

In addition, we should top the effect of the insurance exchange. We should insurance exchange to play a role, which facilitates the comprehensive development of catastrophe management construction by using all kinds of financial tools. And we should set up the mechanism of risk-taking comprehensively, involving government supports and efforts from all sides. We should also cultivate talents of all majors to satisfy the development of multi-formal insurance. The Shanghai government should base on pushing forward the progress of talent accumulation, internalization, marketization and legislation to capture the opportunities as a pilot site and contribute to the reformation and construction of catastrophe insurance system.

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