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Understanding and strengthening the role of catastrophe lottery in catastrophe risk transfer system

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Abstract

Against the background of global climate change and rapid urbanization, all kinds of catastrophic events occur, which challenge regional socio-economic and sustainable development. This Forum contribution introduces the tools and systems of catastrophe risk transfer and its characteristics in practice. The case is then made that the catastrophe risk transfer system needs to be innovated. It is found that the current catastrophe risk transfer system in China cannot on its own meet the needs of catastrophe risk transfer. This contribution argues that a lottery mechanism is one important means for catastrophe risk transfer. Its basic function is risk transfer and thereby raises funds for disaster recovery and reconstruction. Finally, this contribution suggests ways in which to normalize the independent issuance of catastrophe lottery, to strengthen the relevant research work for catastrophe lottery and to explore the catastrophe risk transfer mode of the combination of catastrophe lottery and disaster insurance.

KEYWORDS

catastrophe lottery, catastrophe risk, China, disaster relief financing, natural disaster risk transfer

1 | CATASTROPHE RISK TRANSFER SYSTEMS

Risk transfer, security, disaster relief and emergency management jointly constitute the integrated disaster risk governance model in China (Meng et al., 2015). Disaster risk transfer tools are usually divided into predisaster and postdisaster, and predisaster risk transfer tools are divided into insurance mechanism and non-insurance mechanism (Bergemann & Hege, 2004). At present, a catastrophe lottery is not part of this portfolio. The predisaster risk transfer tools of insurance mechanism include insurance, reinsurance, and financial derivatives also known as catastrophe bonds, risk swaps, options, loss guarantees and catastrophe equity puts (Figueiredo et al., 2018). Postdisaster risk transfer tools include international assistance, disaster relief and emergency response funds and donations.

2 | COMPARISON OF CATASTROPHE RISK TRANSFER TOOLS

Insurance is the first tool used for disaster risk transfer, and it is also the most important way of disaster risk transfer in developed countries (Hiyama et al., 2012). Insurance has a high benefit-cost ratio, which can help guarantee the rapid dispersal of sufficient funds covered by the insurance. However, its function is limited by many factors, such as the need for perfect legal system and regulatory agencies, the need for a large number of insurance objects with large variation, and long market cycle (Lakdawalla & Zanjani, 2012). According to statistics, about 30% of natural disaster losses in developed countries can be covered by insurance (Alexander, 2006), while in developing countries such as China, the average insurance coverage is only 1%. The compensation mechanism of catastrophe loss in China relies largely on social donation, while the role of

market-oriented mechanisms, such as insurance compensation and lottery public welfare fund, are extremely limited (Kong et al., 2018).

Practical experience demonstrates that it is impossible to effectively solve the problem of catastrophe risk management by only relying on a single risk transfer tool (Wang, Weidmann, & Wang, 2017) . It is necessary to integrate the advantages of various tools and gather the strength of the government, enterprises, non-governmental organizations, international financial institutions and international donors to form a disaster safety network to realize efficient catastrophe risk transfer.

3 | CATASTROPHE RISK TRANSFER SYSTEM IN URGENT NEED OF INNOVATION

The development of natural disaster insurance in China cannot meet the needs of rapid social and economic development. The direct economic losses caused by the freezing snow rain disaster in southern China in 2008, the Wenchuan earthquake in 2008 and the Yushu earthquake in 2010 were RMB 151.7 billion yuan, 845.1 billion yuan and 64 billion yuan, respectively, and the insurance compensation was RMB 5 billion yuan, 1.66 billion yuan and 0.8 million yuan, respectively, accounting for 3.3%, 0.2% and 0.01% of the direct economic losses, respectively. In contrast, the direct economic losses caused by Hurricane Katrina in 2005 and Hurricane Ike in 2008 in the USA were US $125 billion and US $38.3 billion, respectively, with insurance payments of US $62.2 billion and US $18.5 billion, respectively, accounting for 49.8% and 48.3% of the direct economic losses (Kong et al., 2018). In addition, the main compensation objects of catastrophe insurance losses in China are large factories, commercial companies and wealthy families, and only a small part is used to disperse the losses of ordinary individuals, especially poor families. After China's Wenchuan earthquake in 2008, one third of the total insurance compensation belongs to Lafarge Ruian Cement Co., Ltd.

In order to ensure the sustainable management of catastrophe risk, China needs to strengthen the development of new ways of natural disasters risk transfer, which adapt to China's economic development across its different regions.

4 | LOTTERY AND CATASTROPHE RISK TRANSFER

4.1 | Lottery in disaster recovery and reconstruction

Countries throughout the world put the funds raised by lottery sales into various public welfare undertakings, such as education, social security and sports, among others. When some catastrophes occur, funds for disaster relief and reconstruction will also be raised via lottery mechanisms. Japan issued a disaster lottery after the Hanshin earthquake in 1995, Niigata earthquake in 2005 and East Japan earthquake in 2011, for which 15 billion yen was raised for the latter by way of post earthquake reconstruction. Following the 2011 6.3 magnitude earthquake in Christchurch, New Zealand, the country's lottery centre decided to use 50% of the lottery sales for postearthquake reconstruction, attracting 83% of the national population to participate, raising a total of 8.35 million New Zealand dollars. After the 2009 earthquake in Abruzzo, Italy, a lottery company issued a special lottery named "Win for Life," which spent 23% of its sales on reconstruction. Within 20 months after the issue, it raised 275 million euro (Shi & Li, 2014; Li, 2016; Shi, 2019) .

4.2 | Lottery in China's response to catastrophe

The development of China's lottery began in the 1980s. A welfare lottery was first issued in 1987, and sports lottery entered the market in 1994. China's lottery officially developed into a national lottery since 2001. The Ministry of Finance is responsible for formulating relevant lottery laws and policies, managing lottery market and lottery funds, and the Ministry of Civil Affairs and General Administration of Sport of China is responsible for organizing the issuance and sales of welfare and sports lotteries. Some 20% of the public welfare fund was still retained by the civil affairs and sports departments, and 80% was used by the Ministry of Finance to supplement the social security fund. The management of public welfare fund lottery has been changed from special financial account management to fund budget management since 2008.

After national catastrophic flood disaster in 1998, China's welfare lottery provided RMB 1.5 billion yuan of public welfare fund for disaster relief. The Ministry of Finance allocated RMB 122 million yuan from the lottery public welfare fund for disaster relief and preparedness between January 2003 and December 2005. After the Wenchuan earthquake in 2008, from 1 July 2008 to 31 December 2010, all the instant lottery public welfare funds centralized by the central government were used for the post-Wenchuan earthquake reconstruction. In the following three years, a total of RMB 11.89 billion yuan of special disaster relief fund was raised, accounting for about 5% of the total public welfare fund (Shi & Li, 2014; Shi, 2019). In the above cases, the contribution of lottery public welfare fund in disaster loss compensation and reconstruction investment has reached or even exceeded the level of natural disaster insurance (Li, 2016).

5 | THE NEED TO DEVELOP THE RISK TRANSFER FUNCTION OF A CATASTROPHE LOTTERY

A catastrophe lottery instrument is not the main tool of catastrophe risk transfer system in China at present. It, however, can play an important role in catastrophe risk transfer in practice because of its great function of raising funds. When the market of insurance and other predisaster risk transfer tools is not perfect and cannot meet the huge demand of China to deal with disasters, the catastrophe lottery has the potential of becoming a new way to disperse

catastrophe risk. Adding a catastrophe lottery will enhance the construction of a more complete and diversified catastrophe risk transfer system and sustainable risk governance in China.

To do that, the government needs to encourage and strengthen the research on catastrophe lottery. At the same time, it is necessary to explore the status and role of catastrophe lottery in China's catastrophe risk transfer system, so as to realize organic integration, overall planning and reasonable choice with other tools such as insurance, and thereby formulate a development mode suitable for China's economic development and social needs.

When it comes to specific research, several areas are in immediate need of further study. At the initial stage of the issue of catastrophe lottery, a large amount of capital investment is needed to support its normal operation so as to attract the public to buy them. In order to attract more public to buy catastrophe lottery, the winning probability and the amount of winning prizes of catastrophe lottery might have to be set larger at the initial stage, which requires that the initial capital investment of catastrophe lottery be larger. However, only relying on the government's financial investment will bring great financial pressure onto the government in addition to other prudential issues of new lottery management and possible abuse. Insurance companies generally have certain financial strength. Therefore, government might consider making insurance companies one of the investors in the initial operation of catastrophe lottery. Indeed, but subject to further study, investment in a catastrophe lottery could also benefit the long-term development of insurance companies, with a new type of mutually beneficial risk investment portfolio where a catastrophe lottery plays a greater role in coping with catastrophe risk for the China and its various regions.

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CONFLICT OF INTEREST

The author has declared that no conflict of interest exists.

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