Research on the Intervention Model of Government to the Forestry Insurance in China

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Abstract. At first, this paper summarizes and analyses the intervention models of government to the forestry insurance internationally. And then, points out the intervention models of government to the forestry insurance which is suited to the situation of China, our government intervention can only operate in a limit way. At last, this paper indicates that forestry insurance should innovate system arrangement mode and technology to solve agricultural insurance problems.

Introduction
Forestry production is vulnerable to various natural disasters. Many natural disasters such as fire, flood, wind, rain and snow will cause huge economic losses to forest farmers and seriously affect the sustainable development of forestry. As an important forestry risk protection mechanism, forest insurance is beneficial to forestry producers and operators to resume production quickly after the disaster and promote the sustainable operation and stable development of forestry. However, due to the high risk of forest insurance and the high technical difficulty, the lack of necessary policy support, the enthusiasm of forestry producers and operators to insure is negative, resulting in the overall lag of China's forest insurance development. According to statistics, from 1994 to 2017, the average annual forest protection of forests is 13 million mu, and the proportion of insurance coverage only accounts for 0.5% of China's forest area, accounting for 1.6% of the plantation area [1]. In 2018, the national forest insurance underwriting area was 77.2 million mu, which was only 2% of the total forest area, and the premium income was only 81.09 million yuan. The disparity ratio once again illustrates the depth and density of forest insurance, making it difficult to play a role in responding to natural disasters. It is great significance to accelerate the development of forest insurance, reduce the loss of natural disasters, and provide support and guarantee for the reform of forest tenure system and forestry financial reform. However, forestry is a weak industry with high risks and long periods. Without policy support, the insurance industry is afraid to get involved and it is difficult to get involved. Therefore, studying the model of government intervention in forest insurance policy has great significance to the sustainable development of China's forestry.

The Status and Evaluation of Government Involvement in Forest Insurance
At present, the government's intervention in forest insurance is mainly embodied in four modes: the sponsorship of the People's Insurance Company of China, the cooperation model of the forestry department, the co-insurance model of the forestry department and the People's Insurance Company of China, and the self-protection mode of the forestry sector.

The Business Model of the People's Insurance Company of China as Host and Agent of Forestry Departments
This model is characterized by government financial subsidy support, commercial operation, and professional management. The government's support for this model is mainly reflected in the financial subsidies for premiums and the reduction of business tax on insurance companies. Commercial operation refers to relying on various business channels already in the insurance industry, and
commercial operation can realize the professional management of forest insurance by virtue of the existing management experience of insurance companies. This model requires the region to have developed economy and strong financial resources. At the same time, support is given to funds and policies, and forestry producers must have a strong sense of insurance. In view of the current imbalance in regional economic development and the backwardness of the forest economy in China, the government's involvement in forest insurance is still in the pilot phase and its application is very limited.

**The Forestry Department and the People's Insurance Company of China**

This model carries out business in the name of Premium income and compensation are shared or borne by the insurance company and the forestry department in a 6:4 ratio. The "co-insurance" approach is an ideal forest insurance system model for major projects and rare catastrophes in the insurance industry at home and abroad, which can reduce the risk of exclusive underwriting and improve the ability to withstand catastrophe risks. But so far, the area of the "common insurance" pilot is still too limited. Due to the large risk unit of forest insurance, most forestry disasters have a large correlation with individual forestry producers. Therefore, it is necessary to engage in insurance operations within a large scope in order to disperse risks in space. Otherwise, in the face of catastrophe, governments with small regional scope and weak financial resources are hard to cover.

**Forestry Sector Self-protection Model**

This model is implemented in Benxi City. The city established the Forest Disaster Masonic Association to carry out forest insurance business. In addition to fire insurance, it also includes comprehensive insurance for various types of insurance such as rodents, windstorms, floods, pests and diseases. This model is characterized by a forest insurance operation with a strong planned economy. The advantage is that the forestry authorities can use their own administrative and technical advantages to support and help the forest disasters, which can effectively prevent the insured's moral hazard and adverse selection phenomenon; the disadvantage is that the risk is relatively concentrated, the scope of a forest disaster mutual aid will be in the same risk unit, the occurrence of a risk accident will inevitably cause the entire community disaster, and the risk is difficult to get dispersed in a large space.

**Rural Forest Insurance Cooperation Organization Model**

Rural forest insurance cooperation organizations are generally located at the township level in the plains. This model is assisted by governments at all levels to establish private forest insurance cooperatives with insurance farmers as the main body. The members of the insurance cooperatives under this model are self-financing, risk-sharing, and benefit-sharing on the basis of voluntary mutual benefit. Therefore, their operations are flexible, and they can be set up according to local conditions, and the insurance premiums are not too huge. The insurer and insured are concentrated in one body, the interests are highly consistent, and the information is relatively complete. In this case, the insured person tends to stand on the position of the insurer and implement risk-based management, thus reducing the risk of moral hazard. On the other hand, because the agricultural forestry insurance cooperation organization exists in a small community area, and the main business target is forestry, and once a forest disaster occurs, the disaster area is large, often affecting several counties or even across provinces. When the members of cooperative insurance are jointly damaged, the insurance is difficult to achieve with the principle of more compensation and self-balance. In the forest insurance, clause design, rate setting, and organization accounting are required. But specialized technical talents are seriously lacking in rural areas.

Among the four modes, the government's intervention methods are mainly premium subsidies, free business tax, direct administrative intervention, guidance and assistance in establishing a forest insurance cooperation organization. In response to the forestry risk situation in different regions and different periods, the government has different combinations and focuses on the choice of forest
insurance model. In a certain period, it has prevented and solved the risk of forestry to a certain extent, and guaranteed the forestry producers. Economic interests have promoted the development of forestry. But it is undeniable that even in the current situation, the government's involvement in forest insurance is not very successful. Since the beginning of the forest insurance pilot project in Lingchuan County, China's forest insurance business has not been widely carried out, showing that the government subsidies are more, administrative interventions are more, forest insurance is carried out well; government subsidies are less, or subsidies are subsidized. If the administration does not intervene, forest insurance will be difficult to carry out and even forced to suspend. This shows that the existing government intervention model is difficult to effectively promote the development of forest insurance.

The Choice of Forest Insurance Government Intervention Mode

Characteristics of the World Forest Insurance Government Intervention Model

As a special economic compensation system, forest insurance is an important measure for forestry risk management. The basic principle of forest insurance operation is to share risks, share losses, and distribute and transfer risks between forest producers or forest producers and society to provide forestry producers with a guaranteed risk protection. The particularity of forestry production determines the high risk, high loss rate and high loss of forest insurance, which makes private insurance companies intervene cautiously and are unwilling to underwrite, resulting in insufficient supply of forest insurance. The special status of forestry makes the forest industry insurance have a strong social spillover. Therefore, whether in developed or developing countries, the government has made a lot of financial investment and institutional support in implementing forest insurance. Throughout the way governments of various countries intervene in forest insurance operations, they can be roughly classified into the following two modes: one is that the government establishes a special forest insurance institution to directly operate forest insurance; the other is that other entities operate forest insurance, and the government provides reinsurance protection and related cost subsidies.

For example, Japan’s forest state insurance has played a very important role in promoting and safeguarding the development of Japanese forestry. Japan adopted the Forest Fires State Insurance Law in 1937 and established the Forest Fire Insurance Special Council insured the forest. In order to save forestry assets assessment costs, forestry agency has established a national unified forest value standard and insurance premium rate [2]. The insured can calculate the value of forest assets and insurance premiums themselves, and the insurance application and claim procedures are very convenient. Obviously, in both developed and developing countries, under the existing risk management and insurance technology level, if forest insurance does not have the government's leading and supportive participation, it may not be customized, because commercial insurance companies can't go to the loss of forest insurance.

Restriction of Government Intervention Mode in China Forest Insurance

Looking back on the development of China's forest insurance, we can find that China has been exploring the development model of self-operated forest insurance, trying to solve the high compensation and low participation rate of forest insurance, which has become the global problem of forest insurance development, but the result isn't satisfactory. Many scholars engaged in forest insurance research have taken into account the particularity of forestry risks, the underdeveloped forest economy, the low ability of forestry producers to pay, the insufficient supply of commercial insurance companies, the quasi-public product characteristics of forest insurance, and business models [3]. In-depth discussion, I believe that the existing forest insurance development model has overemphasized the independent management of various business entities, and has not effectively combined the market economy with government intervention, ignoring the government's macroeconomic regulation and control, and fiscal and financial policies for forest insurance development. The positive support role has led to the
shrinking demand for forest insurance supply, and the natural risks of forestry also can’t be effectively dispersed and transferred. So this model emphasizes the involvement of government forces and requires the government to actively intervene and manage forest insurance through economic, legal, institutional and administrative means.

It is undeniable that the positive role of the government in the development of forest insurance has been proved by the practice of foreign forest insurance development. However, while government intervention has largely alleviated the problem of high compensation and low participation rate of forest insurance and promoted the development of forest insurance, it also created new problems, which led to huge government fiscal expenditures and government finances. In fact, this has also been proved by the practice of foreign government involvement.

So what is the reason for this situation? Our research believes that the effect of government intervention in forest insurance depends on the rational construction of forest insurance operation mechanism and insurance technology innovation. Only by designing a forest insurance operation mechanism that is in line with national conditions and practical, can we talk about the correct intervention of the government on this basis. Foreign governments still can’t effectively solve the problem of forest insurance development after spending a lot of financial expenditures. They can only explain that the forest insurance operation mechanism and insurance technology design are not reasonable enough. On this basis, the government's intervention is obviously unsatisfactory.

The Choice of Government Intervention Model in China Forest Insurance

The weak nature of the forestry industry, the complexity of risks and the spillover nature of forest insurance benefits determine that the government must intervene forest insurance in an effective manner. Compared with the highly subsidized intervention methods of developed countries, when our government intervenes in forest insurance, due to its financial constraints, it has decided that we cannot follow the model of government intervention in developed countries. At the time, the inefficiency of the existing government intervention method determined that the government must take a different approach when intervening in forest insurance.

According to China's specific national conditions, drawing on the experience of foreign governments involved in forest insurance, the Chinese government's involvement in forest insurance should be limited support. Under the limited financial expenditure, the government provides limited and necessary support to forest insurance management activities by means of fiscal, tax, financial and legal policies, in order to promote the development of forest insurance, reduce the loss of natural disasters, stabilize forestry production to the maximum extent, and protect the ecological and socio-economic environment of rural and forest areas.

The Assumption of Government Limited Support Intervention Mode

The limited-supported intervention model requires the government to presuppose the existing or maximum possible fiscal expenditures in China, such as forest insurance policy formulation and mechanism construction. The government is positioned as the secondary subject of risk-taking, and its main role is through finance, taxation, law and other means to establish the necessary external environment, construct a risk management system with the participation of the government, and forestry producers and insurance enterprises as the main part. The basic idea is that the government supports the operation of forest insurance through indirect means, forest insurance system model and insurance technology innovation to achieve that the government only pays out the policy, the forestry producers pay less, and the insurance company can make money. In this model all parties are willing to participate in the pattern of forest insurance.

Innovation of Forest Insurance System Model. The basic idea is to construct a new type of forest insurance cooperative organization with property rights intervention through institutional innovation, that is, to introduce the collective property rights governance model in the forest insurance operation mechanism. The forestry producers participating in the insurance enjoy the premium income right
through the payment of insurance premiums. Every forestry producer participating in insurance has property rights to the insurance fund, but for the operation of the insurance fund, everyone can’t make arbitrary decisions and must make a collective decision. More concretely, firstly it is necessary to recognize that the farmers participating in the insurance have property rights to the premiums paid, and accordingly have the rights to pay premiums, use insurance premiums, and dispose of insurance premiums. In this governance model, insurance organizations also have profitable targets. The realization of its profitability goal is achieved through other operational channels of the insurance fund, rather than through the deprivation of the premium income right. Secondly, the recognition of the premium income right must follow the principle of input to income ratio. That is, regardless of whether the forestry producer participating in the insurance suffers from the risk loss, as long as he is under the collective property rights, the income obtained in the insurance organization will be equal to the proportion of the insurance premium paid, and the core is the forestry producer participating in the insurance. In addition to the right to pay, it also has the right to share the proceeds from the operation of other funds and the claim for personal surplus in insurance fund. The principle of proportional reciprocity of premium income rights can effectively solve the problem of uncertainty and imbalance in the performance of premium income rights under the existing insurance mechanism, and deal with difficult situations of insufficient participation of forestry producers in insurance incentives, and at the same time effectively prevent moral hazard and adverse selection issues. Because under this system, the final investment of individual participating in the insurance forestry producer is proportional to the final return, which makes it lack the motivation to engage in moral hazard and adverse selection behavior.

**Forest Insurance Technology Innovation.** That is to use ART (alternative risk transfer, ART) technology to design low-cost, risk-stable forest insurance products through insurance risk securitization. Insurance risk securitization is an important part of ART technology. It means that insurance companies and investors will adopt a certain institutional arrangement in the form of standardized financial products. The risk of underwriting is widely dispersed in the capital market to maintain a financial innovation that is sufficient to meet solvency in the event of a catastrophe. The biggest difference between insurance risk securitization and reinsurance is that the catastrophe risk is transferred to the majority of investors in the capital market, not just to the reinsurance company, thus avoiding the impact of insufficient solvency and implementing stable operations.

Compared with traditional insurance products, insurance risk securitization products are characterized by relatively low cost, low default risk and high market efficiency. Firstly, insurance risk securitization is a financial risk management tool. By connecting the insurance market with the capital market, the risks faced by insurance companies are transferred and distributed to many investors in the market. The ultimate recipient of risk in insurance risk securitization has been transformed from a former reinsurer to a capital market in a broader sense. Undoubtedly, when the risks are infinitely dispersed, the insurance industry's ability to insure against risks will also be infinitely magnified. In this way, insurance risk securitization can not only transform the insurable risk into insurable risk, but also relying on the strong capital flow in the capital market can easily compensate for the damage caused by the catastrophe. The strict information disclosure system of the capital market and the strict liquidation mechanism will reduce the risk of default to a very low level. This allows insurance companies to have the confidence and courage to carry out forest insurance business, and the state does not need additional financial expenditures, which can effectively resolve the contradiction between government subsidies or policy-supporting insurance and financial scarcity. Second, due to the strong financing capacity of the capital market, insurance risk securitization products designed with art technology have less fluctuations in price than traditional technology design products. Thirdly, insurance risk securitization products designed with art financial engineering technology are relatively inexpensive. Unlike reinsurance, the use of futures or options to hedge has a quick-closing feature. Before the maturity date, as long as the insured believes that the risk has been reduced or disappeared, it is possible to transact the risk assets it holds. Relatively speaking, although reinsurance can terminate the contract at any time, it will inevitably result in higher default costs. In addition, the cost of renewed contracts held by the
reinsurance itself will no longer exist in the insurance risk securitization. In this way, the contradiction between the natural demand for forest insurance and the serious shortage of effective demand can be successfully solved.

**Conclusion**

Due to the quasi-public product characteristics of forest insurance, the government is required to intervene. Even nowadays the government is a key point in forest insurance in developed countries. Moreover, the more developed countries, the greater the role of the government in providing forestry risk protection. As a macroeconomic manager, the government can use its various economic, legal, and administrative powers and means to establish the external environment needed for forest insurance through necessary fiscal, tax, financial, and legal measures, and by virtue of institutional model and insurance technology innovation solving the problem of forest insurance development.

**References**

[1] X.X. Cheng. Analysis of American Agricultural Policy and Agricultural Modernization [J]. Qin. Soc. Scienc., 4 (2017) 20-24.

[2] W. Shi. Japan Forestry Management System, Forestry Legislation and Forestry Policy [J]. Wor. For. Resear., 3 (2015) 41-46.

[3] D. Wang. Theory and empirical analysis of forest insurance in China [J]. Res. Scienc., 7 (2016) 82-85.