Journal of Business and Economics, ISSN 2155-7950, USA
January2016, Volume 7, No. 1, pp. 188-195
DOI: 10.15341/jbe(2155-7950)/01.07.2016/016

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Feasibility of Developing Crop Revenue Insurance in Chinese Regional Economies*

Youyang You
(Yunnan University of Finance and Economics, Kunming 650221, China)

Abstract: This paper discusses the significance and feasibility of developing crop revenue insurance in Chinese regional economies. There are three critical factors for successful schemes, i.e., ample regional yield-price information, effective ways of price discovery and extensive public support for regulation and finances. Although there are problems and inefficient, the foundation of developing crop revenue insurance in Chinese regional economies is available, the developing trend is optimal comparatively. We suggest well-preparing regional yield data and price data, complement the value-found function of crop futures market, reinforce the regulation of agriculture insurance fiscal fund, crop insurance can be implemented in some region experimentally, the discussion and preparation of some rules should be actively developed, specified insurance company can try to accumulate and analyze relevant data in order to research and explore the principal of pricing and measure.

Key words: agriculture insurance; crop revenue insurance; regional yield; agriculture futures market
JET code: Q1

As a marketize way to manage risk and society, agriculture insurance played an important role in transforming agriculture development way, promoting rural finance development and innovating rural social management, it has significant potential power in Chinese regional economies. Agriculture insurance is constituted by yield insurance and crop revenue insurance, yield insurance mainly focuses on the uncertainty of agriculture yield, while crop revenue insurance focuses on the farmer's revenue uncertainty due to price fluctuation. In Chinese regional economies, yield insurance is commonly used, and it is basic for agriculture too, thus, the applications and researches for yield insurance are deep, but for crop revenue insurance, the research in Chinese regional economies is comparatively few, there was only one empirical study for certain special crop revenue insurance premium (Jiang Huifei, 2009).

1. The Current Situation for Crop Revenue Insurance in Chinese Regional Economies

Crop revenue insurance is one of the risk management tools for agriculture product, it appeared in Fed

*This paper is sponsored by Yunnan science and Technology Department application of basic research project-Youth project No.2014FD024.
Youyang You, Regional Economics, Ph.D. Graduate Student in School of Public Finance and Economics, Lecturer in International Business School, Yunnan University of Finance and Economics; research areas/interests: economics. E-mail: 85621767@qq.com.

agriculture insurance plan in 1996, and afterwards, it developed into the one which had the maximum premium ratio size in the global agriculture insurance. According to the data published by American agriculture bureau, until the year of 2010, the crop area covered by the crop revenue insurance, compare with the crop area covered by the whole government supported insurance program, the percentage has raised from 16% to 65% ever since 1997, it became the most popular crop insurance program in the US.

In Chinese regional economies, the agriculture insurance developed rapid in the recent years, now, ever since Chinese policy-based agriculture insurance experimental work enforced from 2004, the premium rises from 4 billion in 2004 to 74 billion in 2011, the accumulated premium revenue is more than 600 billion, cash indemnity is about 600 RMB for every family, which makes around 10% annual income for rural people. In 2011, the agriculture insurance provided risk protection for 1.69 billion rural family, the major grain and oil crop underwritten took 33% percentage for the nationwide sown area, nowadays, there were almost 90% province, city, and district implements agriculture insurance in China. The agriculture insurance size in China has surpassed Japan, only after the US, it ranked No.2 in the world now, it became one of the most important, as well as one of the most active agriculture insurance market in the world (Central Research Institute of China, 2012).

In 2012, Anxin agriculture insurance signed a contract with Songjiang district Disabled Federation, Anxin agriculture insurance brought in crop revenue insurance for the first time for the 32 disabled anti-poverty project located in Shanghai Songjiang district, but the crop revenue insurance has some welfare character, the insurance responsibility and fee ration design are different compare with the US crop revenue insurance in operation model. And what most important is that this crop revenue insurance is not standard enough in calculating revenue according to reference price, it is regional based, not appropriate to adopt in large regional scale, neither for the bigger risk exposure.

The Stability for the famer’s future revenue is very significant for organization product, because the stability of future cash flow not only could make sure the lending money and ordering product factor proper, but also much easier to get banking lending for the farmers. Meanwhile, crop revenue insurance could compensate some disadvantage of the yield insurance, such as when there is a harvest; the market price will go down due to the effect of supply, in this case, the famer’s revenue may be dropped, not rise, then the yield insurance will not pay for the farmer’s losses, but crop revenue insurance could provide corresponding compensation.

Although the yield insurance could deal with the uncertainty of crop yield, the uncertainty of crop price could not be managed, so the uncertainty of farmer’s revenue could not be managed effectively either. The indemnity for the farmer in the bad years is in form of cash, even if for the yield insurance, in practical, the premium and indemnity are being transformed into cash amount according to the price for each unit of crop, generally based on the current market price, meanwhile, since the price has market risks, the fluctuation may be larger. As the effect of globalization, the fluctuation for the crop price is conductive, therefore, the fluctuation for the price might be larger than the fluctuation for the crop yield. According to the empirical study during 1975-2004 in the US, the fluctuation for revenue is larger than the fluctuation for yield regardless from the crop type, or from the regional type.

2. The Study on the Precondition Fundamental Questions for Crop Revenue Insurance Implementation in Large Scale Based on Three Major Elements in China

According to the American authorized research, crop revenue insurance regional data global wise and

empirical statistics from multi-nations in the world, in order to make sure the successful implementation of crop revenue insurance, there were three feasible elements: plenty regional yield-price information; effective price found way; extensive and powerful public finance and supervise support.

(1) The problem of whether there were enough crop regional yield and price information in Chinese regional economies

For crop revenue, the comparatively accurate premium depends on the distribution of regional yield, the distribution of price, and the correlation of yield and price. In order to estimate these distributions and relationships, there should be large amount of accurate historical data; otherwise, the error setting data might generate serious strike to the insurance plan. There were plenty regional yield data in Chinese regional economies, the smallest administration unite for China agriculture statistics data is county-level, the county-level agriculture statistics data is been accumulated large amount ever since 1950's, there were also plenty of reference for regional yield modeling and analysis (Yang Xiaojuan, Liu Buchun & Liu Yuan, 2012). But the accuracy of China historical data should be improved. Since agriculture is extremely important in China, the accuracy of historical data should be paid attention. For the agriculture yield data statistics, the further accuracy and reliability should be make sure (Xie Fengjie, Wang Erda & Zhu Yang, 2011).

(2) The problem of efficient price discovery way

In order to confirm the price for crop revenue insurance, a transparent, objective and non-manipulate price index is needed. Otherwise, the two parties to sign the crop revenue insurance could not make agreement concerning the target price. The price index should have 5 characteristics: standardize able, quantifiable, frequent price publish, pricing based on complete competition, could properly reflect the target value. The forward price index happened to meet all these 5 characteristics, it has high-efficient price discovery function, based on this index, the two parties could reach satisfied agreement for both sides (Fu Lei, 2011). Since the three major future exchange markets are been established for nearly 20 years, regulated management for almost 10 years, the degree of marketwise is higher and higher in the recent 5 years, if the future price index is adopted, there were should be certain amount reliable and standardized exchange data information already in Chinese regional economies. But as the future exchange market established comparatively late, regulated management period is even shorter, there could be some problems since the crop revenue insurance calculation is not accurate by these data (Wei Ge, 2011).

Nowadays, the establishment of future agriculture operation model is been explored in lots of region in Chinese regional economies, the new operation models of "corporation+farm", "futures+order form" are established, but according to those "order form" either like forward contract, or future contract , people could only manage the uncertainty of crop price, not guarantee the farmers revenue are not going to loss, and if we adopt the model of yield insurance plus future contract, the coordination of the insurance and future contract, as well as unnecessary steps are added. In this case, we can explore to insure the revenue directly, so that the intermediate cost could be saved, since the complex pricing process concerning the yield is transferred to the insurer, farmers could concentrate to farm.

(3) The problem of whether there were extensive public finance and powerful supervise support

From the current situation of implementation crop revenue insurance, the extensive and forceful public fiscal policy and supervision support is one of the most important elements to success for crop revenue insurance. Generally, since the agriculture insurance has the characteristic of public goods, and agriculture takes important status in national economy, there were policy support systems for agriculture insurance established in many countries. But in case of crop revenue insurance, since it has characteristics and complexity, more supports and

supervision are needed for many aspects like premium subsidy, reinsurance subsidy, public capital using, exposure price index and surety price. Nowadays, the nations and regions which have weaker fiscal policy and supervise support, as EU and Brazil, the agriculture insurance business volumes are declined. Meanwhile, for those countries and regions where fiscal policy and supervise supports are stronger for agriculture insurance, like the US and Canada (Eyberg area), the agriculture insurance business volumes grow rapid. Although there were certain basics for Chinese regional economies agriculture insurance fiscal policy and supervision, and compare with the other countries, only from the premium subsidy, Chinese subsidy standard for agriculture insurance is not low; the degree of attention to pay should be enhanced. Form the observation from 65 nations according to the world bank, the results showed that the average fiscal subsidy for agriculture insurance in the Western countries are 30%-60%, premium subsidy is 44%, at the same time, Chinese agriculture insurance fiscal subsidy has differences according to the regional differences, normally, the agriculture insurance fiscal subsidy would no less than 60%. For example, according to the China Ministry of Finance, the regulation (2012) No. 2 regulates that in the subsidy policy for the current Central fiscal crop farming insurance premium, based on the subsidy of no less than 25% for the provincial fiscal, the central fiscal subsidy for the eastern area is 35%, for the Middle Western area is 40%. In 2008, Jiangsu province in China got the agriculture crop farming insurance subsidy policy for certain insurable type, it regulates that for the variety level of fiscal policy ratio, the subsidy should no less than 70%. Although there were examples above, since agriculture is important for Chinese regional economies, and China has large population size, the average agriculture resource is comparatively less, Chinese subsidy force should be enhanced continuously. Meanwhile, there are differences in regional economic constitution; in the ratio of agriculture output to regional economy gross output, for some region, especially Middle Western region, the subsidy is not enough. There are still many problems in Chinese regional economies agriculture insurance subsidy, such as fiscal subsidy scope is narrow, insurance subsidy way is single, no operation management fee, and tax and reinsurance subsidy.

3. The Way of Developing Crop Revenue Insurance in Large Scope Feasibility in Chinese Regional Economies

Although there were many problems and insufficiency in the three aspects above, the certain basics for developing crop revenue insurance exists generally, therefore, the development trend and the degree to pay attention to should be increased constantly.

(1) The preparation of regional yield data and price data

The agriculture sampling exploration method adopted in Chinese regional economies is cutting and measuring investigate, which is also the most effective way to make sure the accuracy of crop yield data, and it is a common method in the world. Chinese agriculture yield sampling investigate is established in 1962, although several big institutional change and adjustment have been gone though, the basic way of sampling investigate is not changed, the methods of direct investigate, direct informing are not changed. Crip yield data gathering and accumulation are all directly from farmers and land sample. After the samples are been selected, China statistics bureau branches located in different province and counties checked and confirmed, the samples should be fell into places, specifically belongs to which villager group, or which farmer and land. In order to make sure the data quality, China statistics bureau should be able to control the processes strictly from data quality aspect, meanwhile, for all the investigate material, it should be checked and make sure, the post quality checks are necessary.

(2) The price discovery function analysis for agriculture future market

In the agriculture future market in China, the degree of market is comparatively high, for some crops like bean, corn; the price discovery function for the future price is comparatively high (Yang Qinfang, 2009). To adopt the future price index as the crop insurance price index, the most important requirement is that the future price index should be able to develop the price discovery function, which is "according to open, fair, high-efficient, and competitive transaction operation mechanism, the authentic, predicted, successive, and authority price is formed" (Yu Jingmiao, 2011). Based on the index, the satisfied contract for both parties is formed, in which the transaction costs is the lowest, and after signing the crop revenue insurance, the target price agreement could be easily reached for both parties who sign the contract. There were many researches about future market price discovery function in Chinese regional economies, in this essay, three agriculture future price is mainly considered, which is the bean and corn price in Dalian commodity exchanges, the wheat price in Zhengzhou commodity exchanges(Jia Zhaoli, Bai Mei & Wang Haijun, 2008).

According to generalize the main conference about the future price discovery function of agriculture future price for the bean, corn and wheat from 2008-2011 (Table 1), it revealed that in almost all the current conference, the bean, corn and wheat future price have comparatively high price discovery function, but for the wheat future price discovery function, there are comparatively big difference in the research result, in which the conclusion of " the wheat future price has price discovery function" and " the wheat future price has no price discovery function" took approximately the same amount (Wang Chuan, 2011). This result compared with the researches in the early years, the conclusion changed a lot. Because in the early researches, the wheat future price market is in-effective for forecast according to the early researches, the reason is that the wheat related to the national food security, in this case, the government strongly control the wheat price normally, so the wheat future contract price is lack of the market internal promoting mechanism, but in the recent years, the market degree for the wheat price is enforced. So, the writer thought that for bean and corn, the time to take the future price index as the crop revenue price index is coming, while if the wheat revenue price index could be used need next step researches.

Table 1 The Practical Analysis Results for Bean, Wheat and Corn Future Price Discovery Function in 2008-2011 Documents

Writer and publish time function	Crop	Data Time(Year/Month)	Have/have no price discovery
Yang Qinfang (2009)	Bean	2003/8-2008/4	Have
	Wheat	2003/8-2007/8	Have but weak
Yu JingMiao (2011)	Bean	2005/9-2010/12	Have
Ma ShuZhong (2011)	Bean	2005/1-2009/8	Have
Chen Li, Duan Jindong (2011)	Bean	2008/5-2010/7	Have
	Wheat	2008/9- 2010/7	No
Wang Xiangming (2011)	Bean	2006/9-2010/9	Have
Jia Zhaoli (2008)	Corn	2004/9- 2007/10	Have
Shao Yongtong (2011)	Bean	2005/9-2008/6	Have
Bao Chunsheng (2009)	Wheat	2004/9-2008/7	Have
Wang Chuan (2011)	Bean	2004/1-2008/7	Have
	Corn	2004/9-2008/6	Have
	Wheat	2003/3-2008/12	Have but weak
Li Yanqiu, Zhou Yong (2012)	Wheat	2010	No
Wen Yujing, Wu Yuxia (2010)	Corn	2008/1-2010/12	Have
Wang Xiaoyi, Chen Qiankun (2011)	Wheat	2000/5-2009/12	No
Shen Wenguan (2011)	Wheat	2005/3- 2010/5	Have
Wang Rufang (2009)	Bean	2005/7-2008/6	Have
	Corn	2005/7-2008/6	Have
Song Dongying, Wang Jing (2011)	Corn	2006/10-2011/4	Have
Chen Shuangsheng, Zhao Cong (2010)	Wheat	2005/11-2009/12	Have

In china, letting the insurance company as the manager for the crop revenue insurance has significant meaning. Since the intermedia for China future agriculture exchanges are mainly cooperation and food leading entrepreneur, they are not the specialized risk management institution, neither do they have sufficient financial management experiences, so they cannot provide the comprehensive service for each farmer considering the revenue insurance. Therefore, letting the insurance company which has plenty yield insurance knowledge and the insurance company which has financial risk management experiences operates the crop revenue insurance will be a significant complement for China agriculture industrialization.

(3) The analysis for agriculture insurance fiscal policy and supervision support in Chinese regional economies

The subsidy requirement for crop revenue insurance rates is not high compare with yield insurance. Generally, the rates for crop revenue insurance are comparatively low, but this relationship is unstable, and the differences are comparatively larger in different regions. The rate for crop revenue insurance generally lower than the rate for yield insurance, but when the correlation coefficient is comparatively small for the crop yield and the crop price, the price factor may increase the fluctuation, then make the final crop revenue insurance rates high. In the US, there were negative correlation for crop yield and price during 1973-2006, and when the crop were been planted in larger area, the price and yield also appeared negative correlation for bean and corn, which means under the same condition, the crop revenue insurance rate may low for those two crops. According to one certain kind of crop in Chinese regional economies, from the aspect of pure premium calculation, under the 85% coverage, the crop revenue insurance pure premium for corn and bean are higher than the yield insurance premium, but lower than the actual rates of policy agriculture insurance. For the crop revenue insurance operated in Brazil in the early years, the insurance for crop revenue could even develop in a annually 10% rate even without the government subsidy. Therefore, based on the current fiscal subsidy circumstance in Chinese regional economies, the crop revenue insurance should be able to operate.

In China, the degree of support effort and the importance to attach should be further enhanced for agriculture insurance, especially from the government aspect, the corresponding legislation and supervision system should be formed as soon as possible. According to the 2nd Policy 2012 from the Ministry of Finance, based on the current policy from 2012, the Ministry of Finance should enhance the supporting effort for agriculture insurance further, increase the type of insurance premium to subsidy, enlarge the premium subsidy region, support to enhance the overall coverage level. At the beginning of 2012, the China Insurance Regulatory Commission chairman Xiang JunBo indicate that, for the year of 2012, one of the working point to focus on for the China Insurance Regulatory Commission is to promote the development of agriculture insurance, as well as catastrophe insurance, push forward to establish the uniform agriculture system fame in the legal level, meanwhile, catastrophe insurance should be taken into the national comprehensive disaster protection system.

Actually, early in the year of 2007, China initiated the “policy-directed agriculture insurance rule, and in the May of 2012, the State council published “agriculture insurance rule (suggestion requiring version)”, at the same time, the ideas and suggestions were collecting in the society. In order to work in with the suggestion requiring version, the China Insurance Regulatory Commission was working on the formation of “agriculture insurance supervision temporal method”, which proposed the corresponding supervision requirement and regulation rule. Therefore, during the Twelfth Five Year Plan, the two system ordinances mentioned above will be implemented, the agriculture insurance should be ensured from the aspect of institution support. From all what mentioned above, it is obvious that Chinese government strongly supports the agriculture insurance. For the crop revenue insurance,

the object price index and the supervision of guaranteed price are significant factors, since those questions are more technical, the initial of basic agriculture insurance system, should further carry out and improve the insurance target price index, as well as supervise the surety price.

In summary, as there are plenty regional yield data, certain quantity reliable and standard agriculture futures exchange data, bean and corn futures have comparatively high price discovery function, the foundation of fiscal and supervision supports has exists. Since the support effort and the degree to pay attention to are significantly enhanced, China has the foundation to carry out the agriculture crop revenue insurance in large scale, at least, for the first step.

4. Conclusion

Agriculture insurance is one of the significant pillars for Chinese agriculture industrialization, developing agriculture crop revenue insurance means more for the farmers than the agriculture yield insurance and the agriculture future in Chinese regional economies. The crop revenue insurance could provide reliable insurance protection for the farmer's revenue, and ensure the farmers with stable future income, only after the farmers get stable income, can they loan easily and focus on the production, then they can get the credit from the banks, which ensured they focus on the production further more. The powerful development of the crop revenue insurance will affects the agriculture economic a lot, and strongly pushes the insurance industry innovation.

According to the feasibility analysis for the three elements to develop the crop revenue insurance in large scale in Chinese regional economies, although there are questions and shortages exist in the above three elements, generally, there are certain foundation, and the development trend is comparatively optimal. In China, there are plenty regional yield data, certain quantity reliable and standard agriculture futures exchange data, bean and corn have already got comparatively high price discovery function, agriculture insurance fiscal policy and supervision support has certain foundations, at the same time, the support effort and the degree to pay attention to have enhanced, in this case, the writer suggests that for some part of region, certain kind of crop, like bean, corn, to initial the experimental work, meanwhile, actively develop corresponding system rule, explore and prepare it, push forward the development of related data accumulation and analysis, encourage corresponding pricing and econometrics theoretical foundation research and exploration.

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