

Institutional Arrangement of Member Heterogeneous Cooperative and Cooperation Stability: Evidences from Three Dairy Farmer Cooperatives

Zhen Zhong, Associate Professor;
Chen Zhang, PH.D. Candidate
School of Agricultural Economics and Rural Development
Renmin University of China
Email: zhzruc@ruc.edu.cn

ABSTRACT

The institutional arrangements of farmer cooperatives influence the stability of cooperatives through contract form, risk sharing, and benefit distribution. Taking three Chinese dairy farmer cooperatives as an example, this paper analyzes the logical relationships between contract form, risk sharing, benefit distribution, and cooperative stability. The study suggests that the cooperation stability between cooperative members and organizations has been influenced by benefit distribution and risk sharing of cooperatives. However, contract form, risk sharing and benefit distribution mechanisms have jointly constituted the institutional arrangement of cooperatives. If other conditions are under control and unchanged, the more risks cooperatives take, the stabler the cooperative relationships of cooperatives and members. If the surplus distribution mechanism between cooperatives and members is more distinct, the tendency degree for keeping a stable cooperation relationship of members and cooperatives will be relatively high.

Keywords: institutional arrangement; risk sharing; benefit distribution; cooperation stability; dairy farmer cooperatives

INTRODUCTION

The institutional arrangements of farmer cooperatives (hereinafter referred to as the “cooperatives”) have become an important reason influencing the participation of cooperative members and cooperative performance. The study of Fulton (1999) found that the transaction frequency of between members and cooperatives is higher for the cooperatives with strong homogeneity, clearly established ownership, and transparent governance structure. Qin (2007) took Suzhou Gushangjin Biluochun Tea Cooperative as an example and found that the reasonable institutional arrangements of cooperatives could improve the organization efficiency. The study of Sun and Yu (2012) found that the institutional arrangements of cooperatives have obvious influences on cooperative members and their performances. In addition, a scholar’s study indicated that the institutional arrangements of cooperatives also have obvious influences on governance structure of cooperatives (Huang *et al.*, 2016). However, some scholars discussed the adverse influences of institutional arrangements of cooperatives. The study of Ma and Meng (2008) believed that the dual entrust-agency relationship of farmers’ cooperatives in China fails to ensure the benefits of members. In the market transaction, all the market entities will have the benefit linking relationships with other economic entities. As the important aspect for benefit linking relationship, benefit distribution includes two aspects: form and share of benefit distribution. The most prominent problem in the cooperative

relationship is how to realize the benefit linking mechanism between cooperatives and members. Many scholars conducted the extensive discussions on stable development of cooperatives from perspective of profit distribution of cooperatives (Sexton, 1986; Sun, 2008), and improvement of business performance of cooperatives (Bijman *et al.*, 2012; Zhou and Kong, 2015). Thus the establishment of a reasonable benefit distribution mechanism between cooperatives and members can accelerate the sound development of cooperatives. A cooperative is an organization established on the basis of members, so many scholars pay attention to the cooperation stability between cooperatives and members (Wadsworth, 2001; Wang and Huo, 2011; Hernández-Espallardo *et al.*, 2013). As the members, the farmers generally bear a lot of risks due to small business scale, limited channels to acquire various types of information, and low level of social capital accumulation. The studies of many scholars suggest that the farmers' behaviors are generally risk avoidance (Pingali, 1993; Mi *et al.*, 2012; Liu, 2013; Chou *et al.*, 2014). Therefore the risk sharing mechanism of cooperatives will certainly influence the stability of cooperatives.

Through the empirical observation, it is found that there are various institutional arrangements between cooperatives and their members. In addition to the difference of ownership structure, there is also diversity in contract forms. The studies of some scholars found that the problems on diversity of institutional arrangements and heterogeneity of cooperative members are closely related, and that there are heterogeneities in four aspects: natural resources, capital resources, human resources, and social resources in members (Lin and Huang, 2007). Besides, some scholars argued that there are also differences in motives and purposes for members participating in cooperatives and their roles in the process of establishment and development of cooperatives (Huang and Xu, 2008). The member heterogeneities result in differences on the degree of risks taken by cooperative members, therefore, the cooperatives need to select different institutional arrangements or contract forms in accordance with their members' heterogeneity degrees. Different institutional arrangements and contract forms exert influences on risk sharing and benefit distribution of cooperatives. The cooperative development in China takes the "risk sharing, and benefit sharing" as the basis, and "civilian running, civilian management, and civilian benefits" as the principle. In this cooperative relationship, the collective organizations grammaticalized by gathering of all the members and cooperation stability between collective organizations and members are definitely influenced by risk sharing and benefit distribution¹. Therefore, the risk sharing and benefit distribution mechanisms influence the stability of cooperatives.

In recent years, the development of China's dairy industry has drawn high attention from the government, and has been widely discussed by the academic circle (Zhong, and Kong, 2010; Huang *et al.*, 2013; Zhong *et al.*, 2014; Wang *et al.*, 2015). The dairy farmer cooperatives see a rapid development, not only effectively promoting the production of dairy industry and meeting the society needs, but also forming a set of notable organization model and institutional mechanism. Different internal cooperation relationships reflect different institutional arrangement and

¹ This paper divides the cooperatives into two bureaucracy organizations by hierarchy: the upper hierarchy is cooperative (collective) and the lower hierarchy is member (individual), in which the cooperatives represent, at least nominally, the benefits of most members. However, a cooperative might be an organization for a few core members. When the individual members have the right to freely withdraw from cooperative, it is easy to understand the cooperation between cooperatives and individual members.

benefit distribution methods. What one earth is the logical relationship between the internal institutional arrangements, benefit distribution, and cooperation stability of China's dairy farmer cooperatives? At present, there is lack of thorough and specific experience analysis and theoretic summarization on this important issue. Based on an in-depth analysis on three typical micro cases including Qianyang County Xingsheng Dairy Industry Professional Cooperative of Baoji City in Shaanxi Province, Guangrao County Yangguang Dairy Cow Breeding Service Farmer Professional Cooperative of Dongying City in Shandong Province, and Xinshengyuan Dairy Cow Breeding Farmer Professional Cooperative of Yining City in Xinjiang, this paper tries to answer the following three questions: (1) What are the risk sharing methods between China's dairy farmer cooperatives and members at present? (2) How has the internal benefit linking mechanism of China's dairy farmer cooperatives been formed and what are benefit distribution methods? (3) What is the influence of institutional arrangements of China's dairy farmer cooperatives on internal cooperation stability? How is the influence generated? The conclusion of this study is expected to provide the stable development of China's cooperatives with experience support.

Conceptual Framework and Study Hypothesis

Conceptual Framework

The industrial analysis framework model (Structure-Conduct-Performance), established in the 1930s, enjoys an important position in theory of industrial economic organization and has been widely applied by scholars (Powell, 1996; Goddarad *et al.*, 2001; Klint and Sjöberg, 2003; Behname, 2012). Based on the study results of Luo (2008), this paper builds a theoretical analysis framework² as shown in formulas (1) and (2):

$$CS = f[C, A_1, A_2, T, P_1, P_2] \quad (1)$$

$$O = \lambda[D, R, Q(q_1, q_2), \varepsilon] \quad (2)$$

where CS represents the internal cooperation stability of dairy farmer cooperatives, which is a function of production risk (P_1) and market risk (P_2) faced by dairy farmer cooperatives. T represents other factors influencing the institutional arrangements of cooperatives (such as technology, asset characteristics, industry characteristic, and organization scale etc.). The cooperative stability mainly refers to the breach of contract by members or cooperatives, and withdrawal from cooperatives by members. C represents the optional set for the organizational forms that can be adopted by dairy farmer cooperatives³. Based on the RTCP model of

² Jason and McLean (1979) established the similar model, the "ownership structure – transaction object – measurement capacity – economic performance" (RTCP) model constructed by Biliang Luo (2008) can be considered as the extension of Jason and McLean (1979) model, and the theoretical framework constructed in this paper can be considered as the extension of Biliang Luo (2008) model.

³ In Jason and McLean (1979) model, C is a comprehensive mark of optional set of organization forms, including indicators such as "the form of partnership or joint-stock company, management decentralization degree, self purchase or leasing of equipment, and features of remuneration scheme" etc. In Luo Biliang (2008) model, C is also the optional set of organization forms, including indicators such as technology, knowledge endowment, organization scale, market scale, asset characteristics, and industry characteristics etc.

Biliang Luo (2008), this paper introduces the organizations' attitude toward risks (A_1) and members' attitude toward risks (A_2). F is a generic term for all the cooperation functions, which can be partitioned by institutional arrangements. F_o represents a cooperation function of dairy farmer cooperatives corresponding to institutional arrangement O . The institutional arrangement O is jointly constituted by cooperative risk sharing (R), profit distribution (D), cooperation contract selection set Q (in which q_1 is the formal contract, such as the contract, q_2 is the informal contract, such as the verbal agreement), and other factors (ε).

The logical relationship of conceptual framework built by this paper is shown in Fig. 1.

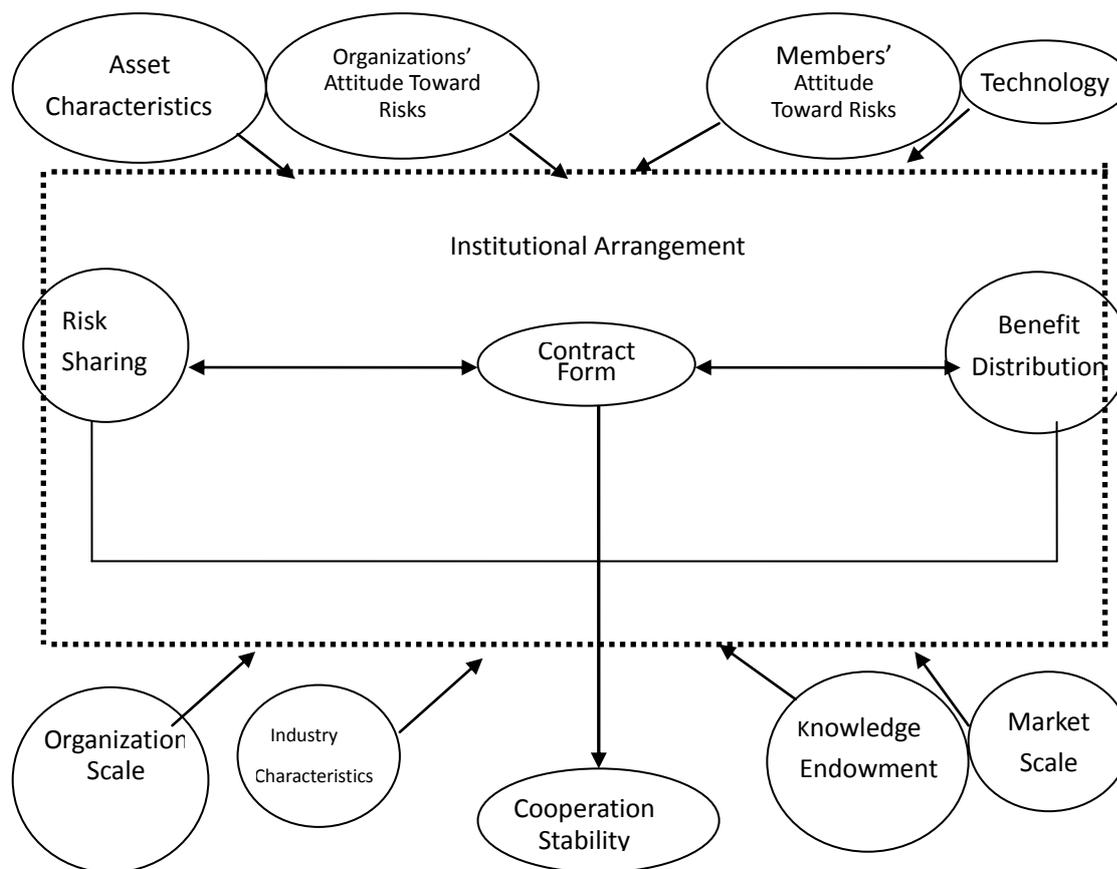


Fig. 1. Conceptual Analysis Framework

Obviously, the institutional arrangement O plays the decisive role to the selectable set of organization forms C . The institutional arrangement decides what kind of organizational form that an organization shall adopt. The more the constraint of institutional arrangement O , the less the space of the selectable set of organization forms C . When C and O are incompatible, the operation cost from organizational forms of cooperatives is extremely high. So this paper assumes that C and O are compatible. It is assumed that the production risk and market risk are established, then the selection of organization form C will influence the cooperation stability between cooperatives and members. Luo (2008) adopted the case of farmers in Ethiopia and found that the institutional structures of cooperatives decide the

organization forms, and then decide the behaviors and influence the economic performance of organizations.

Study Hypothesis

Relevant domestic and foreign theories, such as neoclassical economics and transaction cost economics, argue that a cooperative is an important institutional arrangement alleviating the risks in circulation for members. Although some scholars have expanded the understanding of cooperation risks from the angle of supply chain relationship, arguing that the cooperation risks are from the uncertainty of cooperation relationships among node enterprises on supply chain (Jiaguo Luo, 2010), the cooperation risks among supply chain nodes within the organization, such as the cooperation risks of internal cooperative transaction relationship, has been ignored. In the aspect of risks, there're still risks of default among cooperators. In the aspect of benefit distribution upon the completion of cooperation, the distribution system and power system are isomorphic. The power pattern decides the distribution pattern, and the formation of benefit distribution mechanism is the result of power bargaining among cooperators (Yishan Zhang and Weisheng Yu, 2009). In a dairy farmer cooperative, the members are the owner, patronize, and beneficiary. However, the internal members of China's cooperatives have higher heterogeneity degree. Although the members can enjoy the favorable prices in the internal transaction process of cooperatives, they cannot necessarily participate in the distribution of final cooperation surplus; furthermore, the threshold for entering into the cooperatives is low or it is unnecessary to pay the membership fee, the withdrawal right is sufficient, so the members can apply to withdraw from cooperatives at any time. Therefore, the cooperation relationship between members and cooperatives are influenced by risk sharing and benefit distribution.

Compared with its members, a dairy farmer cooperative, as a collective economic organization, has a higher risk bearing capacity, because of the large operation scale as well as the management, most of whom are social elites with more social capital. It is assumed that the risks can be completely transferred in the internal transaction process of cooperatives and members. The higher risks the cooperatives bear, the lower risks the members will bear. The members often tend to keep a stable cooperation relationship with cooperatives. In the aspect of benefit distribution, the clearer the distribution mechanism of cooperation surplus between cooperatives and members, the clearer the income anticipation of members; driven by the motive to avoid uncertainty, the tendency to keep a stable cooperation relationship between members and cooperatives will be higher.

Based on the above analysis, this study put forward the following two types of study hypothesis. First, when other conditions are under control, more risks (including the production risks and market risks) a cooperative bears, the more stable cooperation relationship between cooperatives and members will tend to. Second, the tendency degree for members to keep a stable cooperation relationship with cooperatives will be higher when there's a clear distribution mechanism of cooperation surplus.

Data and Cases

Data

The data selected by this paper is from the field investigation that was conducted by a research group of Renmin University of China from April to June 2011 on three dairy farmer cooperatives in three places, including Qianyang County, Baoji City, Shaanxi Province, Guangrao County, Dongying City, Shandong Province, and Yining City, Xinjiang Autonomous Region. The investigation mainly adopted the methods of in-depth interview and questionnaire survey to cooperative leaders and members with investigation contents involving basic information, service and cooperation activities, governance mechanism, internal management, operation status, benefit distribution condition, risk sharing condition, development environment, and external relationship etc.

Cases

1. Cooperative of market transaction with dairy farmers bearing all the risks. Shaanxi Province Baoji City Qianyang County Xingsheng Dairy Industry Professional Cooperative (hereinafter referred to as “Xingsheng Cooperative”) is located in Beitai Village, Qianyang County, Baoji City, Shaanxi Province. In April, 2002, the villager committee and Song Jilin, the big cow breeder jointly launched and established Beitai Village Dairy Stock Association, which was changed into Xingsheng Cooperative at a department of industry and commerce in July 2007 with registered capital of RMB 505,800. Upon the establishment, the cooperative adopted the forms of voluntary participation, unified services, secondary rebate, and benefit-sharing compensation, so as to implement the unified management, democratic decision-making, entity operation, household-based feeding and accounting, providing the members with high-quality services centering on main activities of production and sales etc. Now it has become the dairy stock industry demonstration base of Qianyang County. The cooperative, which covers an area of 30 mu, has 138 members (including 1 group member, namely, Beitai Villager Committee), 99% of whom are farmers. Some members of the cooperative even are from three villages of two townships of one county nearby. The cooperative has built 115 standardized cowsheds housing 940 cows, 628 of which are milking cows. Thanks to 14 sets of modernized bionic milking equipment and one feed processing plant, the cooperative has been a modernized milking community integrating cow breeding, mechanical milking, and technological promotion. Real operation, as the most prominent feature, has contributed to the sustainable growth of the cooperative. The cooperative has successively built the feed processing plant, purchased the milking equipment from milk stations, and built three high-standard biogas digesters in the milk station community, further perfecting the infrastructure and growing the operation capacity. The cooperative has been proactively promoted the members’ awareness and capabilities of scientific feeding by free technical training and services, laying a solid foundation for stable growth of members’ incomes. First, the cooperative has employed Professor Wang Renhuai from Baoji City Agricultural School as the technical consultant to provide guidance of feed formula, prevention and treatment of common diseases of dairy cows, with nearly 800 dynamic records for milk cows being developed.. Second, the cooperative has established a veterinarian room for free on-site guidance on epidemic treatment for dairy cows. Third, the cooperative

has worked with the provincial agricultural broadcasting schools in a technical poverty alleviation program, greatly promoting the members' breeding capabilities and quality of dairy stock herds. In addition, Xingsheng Cooperative has repeatedly conducted the technical cooperation with departments of agricultural bureaus, technology bureaus, and veterinary hospitals at city and county levels in Baoji City.

2. Sharecropping cooperative with dairy farmers bearing partial risks. Shandong Province Dongying City Guangrao County Yangguang Farmer Professional Cooperative for Milk Cow Breeding Services (hereinafter referred to as "Yangguang Cooperative") is located at Niujuan Village, Dingzhuang Town, Guangrao County, Dongying City, Shandong Province. Registered and established in December 2003, Yangguang Cooperative adopts the standardized pasture management mechanism, in which the individual breeding farmers from nearby are allowed for centralized feeding, and conducts unified operation as a professional cooperative of cow breeding. At present, the cooperative has 21 breeding households and 1,300 dairy cows with daily milk production of nearly 10 tons. Due to the implementation of unified feeding, the high-quality milk has been recognized by Mongolia Yili Industrial Group Co., Ltd., becoming Yili's milk source base. The breeding farmers need to meet with certain conditions to participate in the cooperative, which implements the unified epidemic prevention, dosing, milking, and sales. The dairy farmers only need to be responsible for feeding the dairy cows and cleaning the cow dung in due time. The milking process of cooperative is quite standard, thereby effectively reducing the contamination of fresh and raw milk. The favorable proportion of Zhengyin feed contributes to a high and stable indicator for various content of fresh and raw milk. The good feed formula can not only improve the quality of fresh and raw milk, but also increase the probability on breeding the heifers, thereby improving the earnings of dairy farmers. The cooperative has tight benefit linking mechanism with Yili: all the milk of Yangguang Cooperative is sold to Yili, with a contract being signed. At present, Yili pays the milk cost at RMB 3.7/kg on time every month. Besides, Yili pays an extra of two costs: management cost and prices converted by content indicator of fresh and raw milk. Yili sends a coordinator to the cooperative to provide a special training for the milking workers, pay the transportation cost of raw and fresh milk, and ensure the safety. Due to the large scale and wide influence, Yangguang Cooperative has been vigorously supported by the local governments, being helped with land circulation, provision of financial support, policy-based insurance, free epidemic prevention and hybridization etc. Most of the required funds of Yangguang Cooperative are from the loans of rural credit cooperatives. The interest rate of these loans, which was benchmark rate at first, has been cut to 6.9% through communicating with the credit cooperatives by local women's association. The cooperative does not adopt the schemes of one man one vote or secondary rebate or dividend, all of which are completely equal to members. The outstanding features of the cooperative are reflected in the following 3 aspects: first, as to feeds, the establishment of cooperative is beneficial to unified management and mutual constraints among members; second, the organizational structure of cooperative is beneficial to co-decision; third, the cooperative has strengthened the collective bargaining ability, for example, it can better help dairy farmers gain profits and enhance their position in bargaining when it is confronted with Yili Group, feed enterprises or other external organizations such as rural credit cooperative.

3. Fixed rental cooperative with dairy farmers bearing no risks. Xinjiang Yining City Xinshengyuan Dairy Cow Breeding Farmer Professional Cooperative

(hereinafter referred to as “Xinshengyuan Cooperative”) is a cooperative led by the local government, jointly established by big cow breeding households and leading enterprise in July 2010, on the basis of Xinjiang Yiling City Bayandai Town Fine Breed Dairy Cow Farm. Xinjiang Yiyuan Dairy Industry Co., Ltd, the largest local enterprise, led the establishment work of the cooperative, with a registered capital of RMB 1 million. The cooperative has established its own articles of association, convened the member representative meeting, and set up the chairman, boards of directors and supervisors. Key members of the board of directors decide the main work. The dairy cow breeding farm of the cooperative, funded by the local government, receives relevant supporting facilities provided by the leading enterprise. The breeding farm has such facilities as three adult cowsheds, one quarantine cowshed, one maternity cowshed, one calf shed, one milking parlour, horizontal silo with volume of 9,000 m³, four meadow piles, and one midden. In accordance with the needs of natural growth of dairy cows, Xinshengyuan Cooperative adopts the modern feeding technology for the implementation of free stall bar feeding (free feeding, free drinking, and free movement) and mechanical centralized milking. With the development of urbanization and industrialization process, the area of household contracted management for land has been increasingly reduced at suburbs of Yining City, making the feed sources of cow breeding inaccessible to farmers and exerting certain influences on dairy cow breeding at suburbs. Meanwhile, with the increase of non-agricultural employment opportunity and improvement of non-agricultural earnings for dairy farmers, the young people prefer to working as migrant workers and are unwilling to be engaged in the dairy cow breeding industry with harder work and less remuneration. The anticipated income of dairy cow breeding has been decreased. Some dairy farmers hope to delegate and sublease the dairy cows, thereby generating the demands for transforming the system of dairy cow breeding. The establishment of breeding system of Xinshengyuan Cooperative has not only solved the dilemma of no land for dairy cows, but also liberated the rural labor forces, thereby realizing the double revenues of fixed revenue from custody of dairy cows and salary from working as a migrant worker. The government has played the enormous role on establishment and development of Xinshengyuan Cooperative. As the outsider of cooperative, the government has utilized its special resources and strength to provide the cooperative with supporting measures of financial support, market information, technology services, and policy preferences etc., helping the cooperative establish the basic facility conditions, and promote the establishment and development. However, the roles of a government are to supervise and manage the market, without involvement in market participation. Furthermore, a government shall not handle all the issues related to the daily management of a cooperative. Therefore, the cooperative needs to rely on its own capacity in the market operation, or rely on a capable market entity to help with operation and management. Xinshengyuan Dairy Cow Breeding Farmer Professional Cooperative is managed by a leading enterprise and the local government serves as a real market supervisor.

Case Study

Selection of Contracts

A contract is the expression of institutional arrangements. Contracts in this paper, include two types: formal contract (such as contract) and informal contract (such as

some implicit agreements and verbal agreements). The institutional arrangements of cooperatives can be reflected in the contracts. The generation and development of contracts selected by the cooperatives in three cases have their respective reasonability and inevitability.

Xingsheng Cooperative has adopted marking linking as the contract form. Xingsheng Cooperative mainly sells the raw milk to small dairy product enterprises, and randomly purchase the raw milk produced by breeding farmers in the market in accordance with market status and demands. Both parties may not sign the contract in advance, but conduct free trading with a market-oriented pricing mechanism. As one advantage of this contract relationship, the cooperative and its members can decide the transaction objects at their own discretion to maximize the benefits. However, the contract relationship also results in such defects as uncertain risks born both by cooperative and dairy farmers, unstable cooperation relationship, and quite loose benefit connection. Meanwhile, Xingsheng Cooperative also implements the contract of cooperation: the members acquire the shares of the cooperative with funds and dairy cows to form a community of shared economic benefits which features co-financing, shared profits and surplus. The members are not only the providers of production means, but also the sharer for the average profits in production, supply, and sales. The rebate type contract signed by the cooperative and its members regulates that the members shall share part of profits of the cooperative and the rebate of profits is implemented on basis of market purchase price.

Yangguang Cooperative adopts the contract relationship of share-cropping. The management of Yangguang Cooperative is relatively formal and the raw milk is sold to the fixed dairy product enterprises. The cooperative and its members sign the legally binding cooperation agreements through a negotiation, which regulate the respective responsibilities, rights, and benefits. A comparatively stable contract relationship is built based on the contracts. This contract form contributes to the sufficient and stable raw milk source for the cooperative, as well as a stable sales channel and market to the products of dairy farmers, reducing the uncertainty of operation. The contract, which regulates the services to be provided by the cooperative for its members before, in, and after production, ensures the profits of dairy farmers based on a market-oriented milk pricing scheme.

Xinshengyuan Cooperative, which was established by Yiyuan Dairy Industry Co., Ltd., a leading company as well as the largest local dairy product manufacturer, with trusteeship management, adopts the fixed rental contract model and has implemented the trusteeship for cows. Meanwhile, a small number of dairy farmers of the cooperative can breed cows by themselves at the breeding farm at the requirements of the company. Xinshengyuan Cooperative implements the leasing contractual nexus mechanism, in which a leading enterprise sign a leasing contract for dairy cows with ownership unchanged and the dairy farmers obtain the fixed rentals. During a certain leasing period, breeding farmers will not long participate in the production of raw milk and all the raw milk is purchased by the leading enterprise.

Risk Sharing

There are a lot of risks in the process of raw milk production and sales, which are by and large related to production and market. As the important manager of production and market risks of farmers, cooperatives bear risks that are inconsistent with those of its members.

Xingsheng Cooperative adopts the sharing method of risk self-retention for

members, which is divided into the following two conditions: first, the cooperative provides the unified services of feed purchase, epidemic prevention, and sales etc., but purchases the products at the market price, so the members bear all the production and market risks; second, the cooperative only purchases the raw milk from members at a market-oriented price without other services being provided, then the members bear all the production and market risks. Therefore, Xingsheng Cooperative bears the least risks while most of the risks are borne by the members.

Yangguang Cooperative adopts a risk-sharing method in which the cooperative and its members who join with dairy cows share the production and market risks at an agreed proportion. When a production risk such as natural disaster or epidemic occurs, the raw milk production will be affected and the members will not be able to obtain anticipated incomes. In the meantime, the cooperative will get less management fee due to the decrease of raw milk and shall bear the loss resulted from rejection by Yili or price decrease due to a low quality. Similarly, the market risks caused by a change of external demands or market price shall be borne by the cooperative and its members. The members bear certain production and market risks, but their transaction risks have been somewhat reduced for joining in the cooperative. Therefore the risk-sharing degree of Yangguang Cooperative keeps in an intermediate level and the members bear fewer risks than Xingsheng Cooperative.

Xinshengyuan Cooperative, which adopts the operation scheme of custody and leasing, bears all the production and market risks in the production and sales of raw milk. The members receive the fixed income floor regardless the operation and market status, but bear no risks at all. Therefore Xinshengyuan Cooperative bears the highest risks and its members do not bear any risks.

Benefit Distribution

Xingsheng Cooperative adopts a benefit distribution method in which the cooperative collects the service fee and earns the price spread of raw milk. Then the members are responsible for their profits or losses. Meanwhile, Xingsheng Cooperative also implements the surplus distribution model of share dividend in combination with the secondary rebate. The members sell the raw milk at a market-oriented price. Both the profits and losses for raw milk production are assumed by the dairy farmers. The cooperative earmarks 20% of its operating revenue for surplus, another 20% for share dividends, and 60% for rebate according to the proportion of transaction volume between the members and the cooperative. The cooperative members have a larger right to control the surplus revenue.

Yangguang Cooperative adopts a benefit distribution model in which the operation incomes are possessed at an agreed proportion. After the dairy farmers join the cooperative, they will completely assume the responsibility for their profits or losses for raw milk production. Yangguang Cooperative pays the milk cost to dairy farmers at the basic price offered by Yili, while Yili pays to Yangguang at a basic price plus the incentive for protein indicator greater than standard value. So the cooperative earns certain spreads and has a stronger control over milk costs. In addition, Yili pays the management fee to Yangguang Cooperative. The dairy farmers have got access to a stable sales channel, with production costs being decreased. And the cooperative gains returns to scale. Therefore, Yangguang Cooperative and its members jointly share the profits from raw milk production.

Xinshengyuan Cooperative implements three major benefit distribution forms: annual fixed custody fee, monthly rental, and sole responsibility for profits and loss

in part of occasions, all of which belong to a link between profit and rental. Under the model of milk cow custody, the members receive fixed profits annually from milk cows that have joined the cooperative, in spite of the milk production and price; the surplus, which is calculated by deducting the rental of milk cows from operating revenue, is owned by the cooperative.

Cooperation Stability

Due to a weak contract relationship, the members of Xingsheng Cooperative can freely withdraw at any time and there are no mandatory constraints to the sales of raw milk. So a breach of contract happens frequently. There has ever been violation of production rules, sales of raw milk to other dairy buyers, small dairy enterprises’ breaching contract, and rejection to milk of members. So the cooperation stability of Xingsheng Cooperative is the lowest.

No member has ever withdrawn from Yangguang Cooperative although a free withdrawal is allowed. There has been a breach of contract by the enterprise, mainly due to the dairy company did not purchase all the raw milk that had been produced. But no breach by a cooperative member has happened. The above analysis shows that the cooperation stability of Yangguang Cooperative keeps an intermediate level.

No withdrawal by a member has occurred in Xinshengyuan Cooperative since its establishment. Thanks to the operation model of up-down drive by government, mandatory management by a leading enterprise, and custody operation for milk cows, the cooperation contract is very stable and no contract breach by member or cooperative has ever occurred. The cooperation stability of Xinshengyuan Cooperative is the highest.

Table 1 summarizes the institutional arrangements, benefit distribution, and cooperation stability of three dairy farmer cooperatives:

Table 1. Institutional Arrangement, Risk Sharing, and Cooperation Stability of Three Dairy Farmer Cooperatives

	Xingsheng Cooperative	Yangguang Cooperative	Xinshengyuan Cooperative
Contract Selection	Market transaction relationship	Share-cropping	Fixed rental system (complete cow custody)
Risk Sharing	Following two conditions: first, the cooperative provides the unified services of feed purchase, epidemic prevention, and sales etc., but members bear all the production and market risks; second, the cooperative only purchases the raw milk from members at a	The cooperative and its members who join with dairy cows share the production and market risks at an agreed proportion.	The cooperative bears all the production and market risks

	market-oriented price without other services being provided, then the members bear all the production and market risks.		
Cooperatives' Capacity to Bear Risks	The weakest	Moderate	The strongest
Benefit Distribution	The cooperative collects the service cost; the cooperative earns the sales price spread of raw milk; the members are responsible for profits and losses.	The operation revenue is possessed at an agreed proportion.	The members receive fixed profits annually from milk cows that have joined the cooperative, in spite of the milk production and price; the surplus, which is calculated by deducting the rental of milk cows from operating revenue, is owned by the cooperative.
Cooperation Stability	The weakest	Moderate	The strongest

Source: Filed according to authors' investigation.

From the above analysis, we can see that due to the differences of institutional arrangements, different contract selections determine difference risks to be borne by a cooperative and its members. According to IQDC explanatory analysis framework, the benefit distribution shall follow the risk compensation principle, and then realize the stability of cooperative. Xinshengyuan Cooperative bears the largest risks with the highest stability of cooperation between members and cooperative, while Xingsheng Cooperative bears the weakest risks with the lowest stability of cooperation. In addition, Xinshengyuan Cooperative has a clear benefit distribution mechanism with fixed annual custody fee and monthly rental, as well as the highest stability of cooperation between members and the cooperative, while Xingsheng Cooperative has a benefit distribution mechanism of untight connection with lowest stability of cooperative. Therefore, both types of hypothesis proposed in this paper have been verified.

CONCLUSIONS AND DISCUSSION

Main Conclusions

The results of above case study suggest that the benefit distribution mechanism of cooperatives is the result from the combined action of institutional arrangement and contract selection. The risk sharing mechanism of cooperatives is the important part of organization forms of cooperatives. And the cooperation stability is influenced by benefit distribution and risk sharing of cooperatives. Specifically, the conclusions of this paper can be summarized into the following three points:

First, cooperatives are an important institutional arrangement that effectively alleviate the risks of agricultural production and market for the members. The benefit distribution mechanism of cooperatives is the result from the combined action of

institutional arrangement and contract selection. The risk sharing mechanism of cooperatives is the important part of organization forms of cooperatives. And the cooperation stability between cooperatives and their members is influenced by benefit distribution and risk sharing.

Second, the more risks the cooperatives take, the less risks the members will bear. Members often tend to maintaining a stable cooperation relationship with a cooperative. As to benefit distribution, the more risks cooperatives take, the stronger control they will exert on profits. They will possess the residual claim or pay fixed rentals to their members.

Third, the clearer the surplus distribution mechanism between a cooperative and its members is, the more exact the anticipation of its members on the profits will be, and the higher the tendency of maintaining a stable cooperation relationship between the cooperative and its members will be. Ensuring profits corresponding to risks is key to the stability of a cooperative. The benefit distribution model harmonizes the relationship of risk sharing between a cooperative and its members, which is good for maintaining the cooperation stability.

Policy Recommendations

Taking the cooperation between dairy farmer cooperatives and their members in China, the study analyzes the relationships between institutional arrangements, benefit distribution, and cooperation stability. The following policy recommendations have been proposed according to the conclusion of the study:

First, the cooperation stability is closely related to risks. Agricultural production is exposed to various risks and participation in a cooperative is one of the important strategies for farmers to manage the risks. Nevertheless, the capabilities of farmers and cooperatives to bear agricultural disasters are limited. So there shall be more external mechanisms for the transfer of risks, such as transfer payment by financial departments and subsidized agricultural insurance. In addition, innovation can be made on the institutional arrangements of cooperatives, such as establishment of risk funds or agricultural insurance cooperatives aimed at mutual aids and joint risk resistance. But these will not fulfilled until cooperatives and their members make a certain progress in awareness, funds, and technologies.

Second, the closeness of cooperation between cooperatives and their members shall be strengthened. Different institutional arrangements determine different types of risk sharing and lead to different benefit distribution models, thereby influencing the cooperation stability. As to farmers of higher risk avoidance, a cooperative needs to bear more risks from agricultural production. And the benefit distribution mechanism of fixed rental could be adopted to ensure a stabler cooperation relationship.

Third, the nation can keep issuing systematic policies supporting the development of cooperatives more scientifically. Based on the economic development, operation, and agricultural risks in different regions, different institutional arrangements and flexible organizational forms can be adopted. Then the risk sharing status will match with the benefit distribution model between a cooperative and its members, realizing stable and sustainable cooperation. And the cooperatives will keep growing, with the income and livelihood of farmers being promoted.

REFERENCES

- Fulton M. Cooperatives and Member Commitment [J]. *The Finnish Journal of Business Economics*, 1999 (14) : 418—437.
- Qin Z.. Another Alternative for Innovation of Farmer Professional Cooperative System: A Survey Based on the Restructuring of Shuzhou Gushangjin Biluochun Tea Cooperative [J]. *Chinese Rural Economy*, 2007 (7): 60-66.
- Sun Y., H. Yu. Research of Influences of Institutional Arrangements of Farmer Professional Cooperatives on Member Behavior and Organizational Performance [J]. *Journal of Nanjing Agricultural University (Social Sciences)*, 2012 (4): 61-69.
- Ma Y., Meng C.. Dual Principal-Agent Relationship of Chinese Farmer Professional Cooperatives: Current Problems and Thoughts for Improvement [J]. *Issues in Agricultural Economy*, 2008(5): 55-60.
- Huang Z, Wu B, Xu X, *et al.* Situation Features and Governance Structure of Farmer Cooperatives in China: Does Initial Situation Matter?[J]. *The Social Science Journal*, 2016, 53(1): 100-110.
- Sexton R J. The Formation of Cooperatives: A Game-theoretic Approach with Implications for Cooperative Finance, Decision Making, and Stability[J]. *American Journal of Agricultural Economics*, 1986, 68(2): 214-225.
- Sun Y.. Analysis on Benefit Mechanisms of Farmer Professional Cooperatives and Influencing Factors: Based on Empirical Research in Jiangsu Province [J]. *Issues in Agricultural Economy*, 2008 (9): 48-56.
- Bijman J, Iliopoulos C, Poppe K J, *et al.* Support for Farmers' Cooperatives [J]. Final Report of European Commission, Brussels, 2012.
- Zhou Z., Kong X.. Influences of Surplus Distribution on Performance of Farmer Cooperatives: Take Heilongjiang Province Keshan County Renfa Agricultural Machinery Cooperative as Example [J]. *China Rural Survey*, 2015 (5): 19-30.
- Wadsworth J. Keep the Co-op Candle Burning[J]. *Rural Cooperatives*, 2001, 68(2): 19-20.
- Wang P., Huo X.. A Theory of Farmers' Withdrawal from Cooperatives and Empirical Analysis Framework: Analysis on Survey Data of 367 Fruit Farmers' Withdrawal from Cooperative at Apple Zone in Bohai Bay [J]. *China Rural Survey*, 2011 (5): 14-24.
- Hernández-Espallardo M, Arcas-Lario N, Marcos-Matás G. Farmers' satisfaction and Intention to Continue Membership in Agricultural Marketing Co-operatives: Neoclassical versus Transaction Cost Considerations[J]. *European Review of Agricultural Economics*, 2013, 40(2): 239-260.
- Pingali P L. Pesticides, Rice Productivity, and Farmers' health: An Economic Assessment[M]. IRRI CABI, 1993.
- Mi J., Huang J., Chen R., *et al.* Risk Avoidance and Pesticide Application of Chinese Cotton Farmers [J]. *Chinese Rural Economy*, 2012(7): 60-71.
- Liu E M. Time to Change what to Sow: Risk Preferences and Technology Adoption Decisions of Cotton Farmers in China[J]. *Review of Economics and Statistics*, 2013, 95(4): 1386-1403.
- Qiu H., Luan H., Li J., *et al.* Risk Avoidance's Influences on Excessive Pesticide Application of Farmers [J]. *Chinese Rural Economy*, 2014(3): 85-96.
- Lin J., Huang S.. Analysis on Membership Heterogeneity and Ownership of Farmer Professional Cooperatives [J]. *Issues in Agricultural Economy*, 2007, (10):: 12-17.

- Huang S., Xu X.. Analysis on Membership Heterogeneity and Organizational Structure of Farmer Professional Cooperatives [J]. Journal of Nanjing Agricultural University (Social Sciences), 2008, 8(3): 1-7.
- Zhong, Z. Kong X.. Research on Influences of Brokers on Supply Chain of Fresh Milk [J]. China Soft Science, 2010 (6): 68-79.
- Huang J, Wu Y, Yang Z, *et al.* Marketing China's milk: A Case Study of the Sales Activity of Dairy Farmers in Greater Beijing[J]. China Economic Review, 2012, 23(3): 675-689.
- Zhong Z, Chen S, Kong X, *et al.* Why Improving Agrifood Quality is Difficult in China: Evidence from Dairy Industry[J]. China Economic Review, 2014, 31: 74-83.
- Wang J, Chen M, Klein P G. China's Dairy United: A New Model for Milk Production [J]. American Journal of Agricultural Economics, 2015, 97(2): 618-627.
- Powell T C. Research Notes and Communications. How much does Industry Matter? An Alternative Empirical Test[J]. Strategic Management Journal, 1996, 17(4): 323-334.
- Goddard J A, Molyneux P, Wilson J O S. European Banking: Efficiency, Technology and Growth[M]. Wiley, 2001.
- Klint M B, Sjöberg U. Towards a Comprehensive SCP-model for Analysing strategic networks/alliances[J]. International Journal of Physical Distribution & Logistics Management, 2003, 33(5): 408-426.
- Behname M. The Compare of Concentration and Efficiency in Banking Industry: An Evidence from the OPEC Countries[J]. Eurasian Journal of Business and Economics, 2012, 5 (10): 15-24
- Luo B.. Cooperation Rational, Transaction Object, and System Performance: Comparative Study of Wens and Changqing Fruit Farm [J]. Case Study of Transition of Chinese Systems (Guangdong Chapter) (Volume 6), 2008.
- Liu J.. Research of Supply Chain Benefit Distribution and Decision Making Based on Risks of Emergencies [D]. Harbin Engineering University, 2010.
- Zhang Y., Yu W.. Most Optimal Allocation of Economic Power Structure and Production Elements [J]. Economic Research Journal, 2009(6): 23-26.

Date submitted: July 19, 2017

Reviewed, edited and uploaded: August 1, 2016