Organization and Strategy of Farmer Specialized Cooperatives in China

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1 Introduction

The economic organization of agriculture is a timely research topic. Among other organizational forms, cooperatives have always been a prominent organizational form. Broadly defined, a cooperative is an organizational form of many independent growers (horizontal relationship) who jointly own a downstream processor / retailer (vertical relationship). Cooperatives are important to agriculture in developed as well as developing countries. For example, there are 132,000 cooperatives with 83.5 million members and 2.3 million employees in the European Union in 2001, 47,000 cooperatives with 100 million members in the United States of America in 2001, and 94,771 cooperatives with 1,193 million members in China in 2002.

Studying agricultural cooperatives in China is of particular interest for three reasons. First, as noted by the new institutional economists such as North and Williamson for a long time, the *institutional environment* interacts with the governance structure of firms. Menard and Klein (2004, p.750) point out, "These background conditions should not be regarded merely as constraints that hamper modernization. They also create incentives for the discovery of more efficient modes of organization. Comparing firms across different institutional environments to see what settings facilitate organizational innovation and what settings hamper it contributes dramatically to our understanding of the dynamics of a market economy".

China provides an opportunity to explore the interactions between firms and the institutional environment. The institutional environment in a transition country like China is quite different from those in developed countries such as U.S.A and Western European countries. China's economy is unique in many aspects. There are more than 200 million farmer households (i.e. a vast population of 0.8 billion farmers), each farming a plot of

land that is similar to a garden plot elsewhere. For these small farmers, a major problem in the transitory period is the breakdown of the relationships of the farm with input suppliers and output markets. They face serious constraints in accessing essential inputs, such as feed, fertilizer, seed, capital, and in selling their products. Does the Chinese cultural and institutional background matter for the cooperative as a governance structure?

Second, compared with stock listed corporations, cooperatives have their own salient characteristics such as member-ownership and member-control (Staatz, 1987; Vataliano, 1983; Cook, 1995; Hendrikse and Veerman, 1997; Hendrikse, 1998). However, these characteristics are described and examined mainly against the background of developed economies/agricultural sectors. Are these characteristics also descriptive of agricultural cooperatives in countries in *transition*? Since the late 1980s, new farmer cooperative organizations have emerged and developed rapidly all over China. These new cooperative organizations are quite different from the cooperatives in the 1950s and 1960s. What are the governance structure choices in these cooperative organizations? What are the factors driving such choices?

Third, appropriately organizing the farmers into the agricultural *chain of production*, transaction and consumption will not only benefit farmers but also benefit the overall performance of the economy. As China entered WTO, world industrial markets as well as agricultural markets have been affected by this vast economy. The study on how to organize and position Chinese farmers in agricultural supply chains is meaningful for the health of the Chinese economy as well as the world economy. Are Chinese cooperative organizations a feasible organizational form to the organization of farmers in an increasingly global agri-food supply chain?

The above questions will be addressed in the next sections. The relationship between the various questions and sections can be understood from the levels of institutional analysis distinguished by Williamson (2000). The most general level is Embeddedness, where informal institutions, customs, traditions, norms, and religion are at the center of analysis. Change occurs only once in 100-1000 years. The Institutional Environment is concerned with the formal rules of the game, like bureaucracy, polity, and the judiciary. Change occurs in 10-100 years. Governance is about contracting and aligning governance structures with transactions. Changes occur in a time frame of 1-10 years. Section 2 describes the history of farmer cooperatives in China (2.1), i.e. Institutional Environment, and Chinese society (2.2), i.e. Embeddedness. This provides the background for our study. Section 3 is institutional analysis at the level of Governance. It presents the data regarding 66 farmer cooperatives in Zhejiang province. In section 4, we will enrich the observations of section 3 by describing the interaction between the attributes governance structure, strategy, and quality control system of a specific cooperative. In section 5, we look at these developments from a number of theoretical perspectives and formulate various conclusions. Section 6 concludes.

2 Farmer cooperatives in China during the last century

This section consists of two parts. We start with a brief history regarding cooperatives in China in subsection 2.1. Subsection 2.2 is dedicated to a number of observations regarding Chinese society because it plays a role in understanding farmer cooperatives in China.

2.1 One century of cooperatives in China

Cooperative organizations are not new phenomena in China. Their history dates back to the beginning of the twentieth century. Five periods are distinguished. First, cooperatives emerged in some part of China as early as in 1920s. Cooperatives

experienced a rapid increase from 722 in 1928 to 168,864 in 1948 (Du, 299). Second, New China was established by the Communist Party coming to power in 1949. The central government gradually confiscated land from landlords and rich farmers, and then distributed it for free to poor and landless farmers. At the same time, to help farmers, who were short of tools and skills, to grow crops efficiently, various kinds of cooperative organizations were set up, motivated and later even directly organized by the government, to pool resources.

Third, from 1955 to 1979, the so-called 'Cooperative Movement' took place, and cooperative organizations were gradually deprived of their voluntary character and became a way for the government to centrally control and manage agricultural production, exchange and consumption. Agricultural production became collectivized. The system of collective farming remained until 1979.[1] Under the system of collective farming, supplying of farming inputs, producing and selling products are all centrally planned by governments. The so-called 'Supplying and Marketing Cooperatives' in rural areas were government organizations which supplied inputs and consumption goods to farmers. Agricultural products were collected and distributed by governments, and were normally not allowed to trade freely in markets. In general, before 1980s, the 'Unified Purchasing and Supplying System' (UPSS, i.e. 'tong-gou-tong-xiao' in Chinese) was adopted as the basic institution governing government and farmers regarding producing sales of agricultural products until early 1980s.[2]

Fourth, China started an economic and political transition in 1978. Central planning of economic activities was gradually transformed to a market-oriented system. This

[1] One point is worth making here. The cooperative organizations in 1960s and 1970s were not farmer-owned and farmer-controlled by nature. They turned into government or quasi-government organizations performing both economic and political functions.

[2] The central government decided to take 'planned purchasing and planned supplying' on oil agri-products and grain on November 1953, and expanded the planning spectrum to include cotton on September 1954. The policy issued on August 1955 specified the details.

ongoing institutional change has far-reaching influences for individuals as well as organizations. Firstly, the collective-based farming has been substituted by family-based farming. Secondly, the centrally planned agri-food purchasing and supplying system was gradually transformed to a market-oriented system.

As China transits from centrally-planned economy to market-oriented economy, traditionally small farmers are facing a new situation. Under the old collective producing and distribution system, farmers did not decide what to produce, how much to produce, and how to sell products. In the transitory period, they have to make these decisions by themselves. However, it is not easy to successfully make such decisions. The survival of farmers depends on how, and to what extent, they meet the demands of final consumers.

Motivated by the new situation since the 1980s, new cooperative organizations emerged in many provinces of China in the late 1980s. Up to 2004, the number of new cooperative organizations is more than 150,000 (Green book of china's rural economy, 2004, p.157). The new cooperative organizations that have emerged since the 1980s may take different forms. In general, we can distinguish two basic forms: farmer specialized associations and farmer specialized cooperatives. Farmer specialized associations account for 65% and farmer specialized cooperatives account for 35% of the 150,000 cooperative organizations in 2004 (Green book of china's rural economy, 2004, p.157). The main difference between the two forms is the ownership of fixed assets and performing functions like production, marketing, or processing. In general, specialized cooperatives are registered at the Administration of Industry and Commerce, have fixed assets, and are like cooperatives in western countries in terms of their production, marketing, and processing activities. Farmer specialized associations are registered at the Civil Affairs Bureau, have no fixed assets, charge no membership fee, provide some technical assistance, and share information.

2.2 Chinese society

Farmers choose a certain organizational form (i.e., a governance structure) to realize a fair return on investment. This choice is not independent of the society in which the farmer lives. It is important to realize that a person is not only a natural or economic person, but also a social person. He (she) lives in a society, which can be viewed as a nexus of various relations. This is particularly true for Chinese farmers with characteristics like community life, influence of traditional culture, and the imperfections of the current market system. There are three basic ways for most of Chinese farmers to participate in the society. The first is kinship, i.e., the relations between an individual and his or her spouse, parents, sisters and brothers, and cousins. The second is social relations, i.e., the relations between an individual and his or her friends, classmates, and colleagues. The third is potential relations, i.e., the relations between an individual and strangers; it is actually based on the first two relations.

The origin and development of farmer cooperatives in China have therefore an informal institutional background based on relations. The kinship (or relation) plays an important role in the cooperatives. First, as an organization based on the rural communities, the farmer cooperative is characterized by kinship. Second, the kinship is an important way for Chinese farmers to access to various resources. It's particularly important at the initial stage of farmer cooperatives. Third, the governance and operation of farmer cooperatives also relies on the principle of kinship. It's a principle combining kin, loyalty and abilities. Therefore, it's natural for the farmer cooperatives to have some characteristics of traditional social relations in the process of their development and operation. Such rural social relations are combined by kinship and market rules. A lot of farmer cooperatives in Zhejiang province find an effective balance in such social relations. The internal transaction costs based on such relations is quite low.

3 Farmer cooperatives in the Zhejiang province

This section presents the data of a sample of 66 farmer cooperatives in Zhejiang province in China. Zhejiang province is located south of Shanghai, with 46 million inhabitants. It was the pilot province for farmer specialized cooperative organizations chosen by the Ministry of Agriculture, China. To a certain extent, the institutional arrangement of farmer cooperatives in Zhejiang not only reflects the common characteristics of farmer cooperatives in the coastal areas of China, but may also represent the development trend of farmer specialized cooperatives in China.

Farmer cooperatives in Zhejiang have experienced a rapid development since 1990s. Like other regions in China, Zhejiang's farmer cooperatives can be divided into specialized cooperatives and specialized associations. Both specialized cooperatives and specialized associations have increased rapidly, however, specialized cooperatives increase at faster rate than specialized associations. The farmer specialized cooperatives increased from 791 in 2002 to 1,789 in 2004. The number of farmer specialized associations was 1,019 in 2004. The total number of the farm households joined in farmer cooperatives reached 554,000 and the total number of the farm households involved in farmer cooperatives reached 2,029,500 in 2004.[3]

A sample of 66 farmer specialized cooperatives was chosen randomly from the Zhejiang province. Data regarding ownership structures were collected. Table 1 shows the number of members, the number of shareholders, the capital stock, the capital stock per-capita, the ratio of shareholders to all members and the shareholding concentration rate[4].

[3] Source: Zhejiang Provincial Department of Agriculture.

[4] Shareholding concentration (*Ri*) refers to the ratio of the sum of the capital stock owned by the top *i* member(s) in a descending sort to the total capital stock in a cooperative. In detail, $R_m = \sum_1^m X_i \Big/ \sum_1^n X_i \ (m \le n)$; Where *Xi* refers to the sum of the capital stock owned by the top *i* member in a descending sort; where *N* refers to the number of cooperative members.

Co-ops	No of member	No of share-holder	Capital stock (¥)	Per-capita capital stock (¥)	Share-holders to members	R_1	R_3	R_5	R_8	R_{10}
Max value	1000	812	7010000.00	584166.67	1.00	0.82	1.00	1.00	1.00	1.00
Min value	36	2	6800.00	47.22	0.01	0.00	0.01	0.01	0.02	0.02
Mean value	259.318	102.485	365089.00	23001.77	0.45	0.25	0.44	0.55	0.64	0.67
Standard deviation	216.944	144.910	896312.41	75027.32	0.42	0.22	0.29	0.32	0.32	0.32

Table 1: Ownership structure of 66 sample cooperatives

Several observations can be formulated regarding table 1. Firstly, in our sample of 66 farmer cooperatives, the size of cooperatives varies a lot. In terms of membership, the largest cooperative has 1,000 members, while the smallest cooperative has just 26 members. In terms of capital stock, the cooperatives vary from as low as 6,800 yuan to over 7 million yuan. Table 2 provides the additional information regarding the size distribution of cooperatives. The number of cooperatives with more than 500 members and the cooperatives with less than 100 members are limited. Over half of cooperatives have more than 100 and less than 200 members.

No of members	＞800	＞500	＞300	＞200	＞100	＞50	＞0
No of co-ops	4	8	20	27	62	65	66
Frequency (%)	6.06	12.12	30.30	40.91	93.94	98.48	100.00

Table 2: Interval distribution of number of members

Secondly, according to table 1, all cooperatives have shareholders. However, the numbers of shareholders of the sample cooperatives varies also drastically. The number of shareholders varies from 2 to 812. Table 3 illustrates the interval distribution of the number of shareholders in our sample. The cooperatives with more than 200 shareholders and these with less than 5 shareholders are fairly limited. 20 cooperatives, almost one third of the sample, have between 100 and 200 shareholders; 26 cooperatives, over one third of the sample, have between 5 and 30 shareholders.

No of shareholders	＞200	＞100	＞50	＞30	＞10	＞5	＞0
No of co-ops	9	29	31	34	48	60	66

Frequency (%)	13.64	43.94	46.97	51.52	72.73	90.91	100.00

Table 3: Distribution of the number of shareholders

Thirdly, the capital stock of the cooperatives varies between 7,000 and 7,000,000 yuan; and the per-capita capital stock varies between 50 and 50,000 yuan. Table 4 shows the interval distributions of capital stock and per-capita capital stock. Regarding capital stocks, only two cooperatives held a capital stock of more than 1,000,000 yuan, and the cooperatives with a capital stock of more than 500,000 yuan are limited. For about one third of the cooperatives, their capital stock is between 10,000 and 200,000 yuan. Regarding per-capita stock, about one third of cooperatives have more than 10,000 yuan per-capita capital stock, and about one third of cooperatives have a per-capita capital stock between 1,000 and 5,000 yuan. There is only one cooperative with less than 100 yuan per-capita capital stock, and there are quite a few cooperatives whose per-capital capital stock is between 100 and 1,000 yuan.

Capital stock (10,000 ¥)	＞100	＞50	＞20	＞10	＞5	＞1	＞0
No of co-ops	2	8	27	42	54	65	66
Frequency (%)	3.03	12.12	40.91	63.64	81.82	98.48	100.00
Capital stock per-capita (¥)	＞10000	＞5000	＞1000	＞500	＞200	＞100	＞0
No of co-ops	21	26	54	60	62	65	66
Frequency (%)	31.82	39.39	81.82	90.91	93.94	98.48	100.00

Table 4: Interval distributions of capital stock and per-capita capital stock

Fourthly, shareholding among members is pervasive. However, member shareholding varies a lot. The rate of shareholders to members is as large as 1 at one extreme and as small as 0.01 at the other extreme, with the mean value being equal to 0.45 (see column 6, table 2). Table 5 further shows the detailed information on members' shareholding. There are strong contrasts on the member shareholding structures in the sample. In 21 cooperatives, the rate of shareholder members to all members is higher than 90%; in 24 cooperatives, this rate is lower than 10%, and in 15 cooperatives, this rate is

between 10% and 50%. These cooperatives therefore can be divided into two groups: one group with high member shareholding, and the other group with low member shareholding.

Proportion of shareholder members to all members	>0.9	>0.8	>0.7	>0.6	>0.5	>0.4	>0.3	>0.2	>0.1	>0.0
No of Co-ops	21	23	25	27	27	28	28	36	42	66
Frequency (%)	31.83	34.85	37.88	40.91	40.91	42.42	42.42	54.55	63.64	100

Table 5: Interval distribution of the proportion of shareholder members to all members

Fifthly, shareholding is not uniformly distributed among shareholders, and large shareholders' dominance in the provision of capital is salient. Table 1 shows, on average, the top 5 largest shareholders account for 50% of the provision of capital in a cooperative, and the top 10 largest shareholders contribute for almost two thirds of the capital stock. Table 6 further captures how shareholdings are concentrated in cooperatives. In 11 cooperatives, the largest shareholder provides more than 50% of equity capital; in 25 cooperatives, the top three largest shareholders provide more than 50%; the top 5 largest shareholders provide more than 50% of equity capital in half of the sample cooperatives.

	R_m> 0.9	R_m > 0.8	R_m> 0.7	R_m> 0.6	R_m > 0.5	R_m > 0.4	R_m > 0.3	R_m > 0.2	R_m > 0.1	R_m > 0.0
R_1	0	1	4	5	11	17	21	26	45	66
R_3	5	9	15	20	25	31	39	47	59	66
R_5	14	18	24	28	33	40	47	57	59	66
R_8	22	26	31	37	40	49	53	58	60	66
R_{10}	26	31	35	40	42	51	55	58	62	66

Table 6: Concentration of shareholding

In sum, most cooperatives are small; shareholding is pervasive among most cooperatives; the cooperatives are usually composed of a minority of core members (usually big shareholders) and a majority of common members (usually users or patrons); the cooperatives can be generally divided into two types: one is with a minority of members as its shareholders; the other is with a majority or all members as its

shareholders. For most cooperatives, shareholding is quite concentrated; big shareholders play a dominant role in providing capital.

4 Wenling City Yu-heng watermelon cooperative

In this section, we will examine a specific cooperative in the Zhejiang province in order to enrich the observations of the previous section. Wenling City Yu-heng Watermelon Cooperative (we call it Yu-heng watermelon cooperative hereafter) is located in Yuheng town, Wenling city, Zhejiang province.[5] It was initiated in July 2001 by 29 farmers including the present General Director, and was registered as a share-cooperative enterprise by the local Industry and Commerce Administration in February 2002. The main business of the cooperative involves growing and selling watermelons.[6] In 2004, it had 129 members with the fixed capital of 2.96 million Yuan.

Organizations, and therefore cooperatives, can be characterized in many different ways. We adopt the systems of attributes characterization of Holmstrom and Milgrom (1994). Three clusters of attributes are distinguished in describing this cooperative: governance structure (4.1), quality control system (4.2), and strategy (4.3). We conclude the section by paying attention to the complementarities between these attributes (4.4).

4.1 Governance structure

We follow Hansmann (1996) by distinguishing decision and income rights of a governance structure. Decision rights specify who directs the firm's activities, i.e. the allocation of authority. Various decision rights in Yu-heng watermelon cooperative will be described, like membership composition, share contribution requirement, restricted ownership, delivery rights, quasi-individual ownership title, formal versus real authority, and member involvement. Income rights specify who appropriates the net earnings of the enterprise, i.e. delineate incentives.

[5] Wenling is a city of 780,000 citizens in Zhejiang province, China; Yuheng is a town south of Wenling.
[6] It also sells farming medicines, fertilizer, etc as a side business.

Decision rights

Yu-heng watermelon cooperative has 129 members. Most members are watermelon growers and about 20 members are watermelon sellers. The cooperative requires all members to buy shares, where the number of the shares which members have to buy is determined by the planting scale. The larger the planting scale is, the more shares a member has to buy. However, the maximum shareholding for one member is set to be 20%.

Membership is closed in this cooperative. On the one hand, to become a member, farmer growers have to reach a certain scale of growing watermelons and have to meet a certain technical requirement. On the other hand, to leave the cooperative, current members are required to submit a written application to the cooperative.

Delivery rights are restricted in Yu-heng Watermelon Cooperative. Firstly, delivery rights are restricted in terms of quality requirements. Members have rights to deliver products to the cooperative, but their products must meet ex ante specified quality standards. Sample inspection and internal grading will be used to distinguish high quality products from low quality products. Secondly, delivery rights are restricted in sense that the delivery amount for one member is almost ex ante determined.

Although Yu-heng Watermelon Cooperative is collectively owned by members, each member's claim on the cooperative seems to be clearly defined. Firstly, individual members' ownership is specified in terms of shares. Secondly, the cooperative allows the members to participate in decision making according to shareholding structure. The one-member-one-vote principle is substituted by the restricted one-share-one-vote principle. The latter voting rights will motivate members to collect/commute information to participate in management of cooperatives. Thirdly, shares can be redeemed when

members quit cooperative. Thus, members can get back his financial stakes in cooperatives.

Ownership defines the allocation of formal authority. Figure 1 captures how formal authority is allocated in this cooperative. Members participate in the (representative) member assembly by a restricted 'one-share-one-vote' principle. Voting rights are based on 'one-share-one-vote', but one member has at most 20 votes. The decision making process in the (representative) member assembly is by a qualified majority. A decision is reached when more than 2/3 of the votes are in favor.

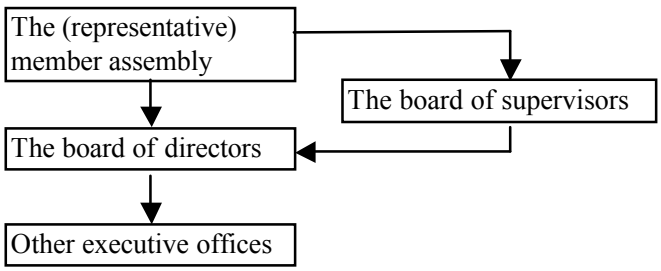

Figure 1 Allocation of Formal Authority

Although formal authority clearly resides with the members and the assembly, real authority may reside with the others. Actually, many decisions have to be delegated to other groups. Normally, these groups include the board of directors and/or a group of managers.

The allocation of real authority may vary widely within one formal organizational arrangement. This issue is illustrated by the outcome of a short questionnaire on the involvement of non-director members in decision making. The results are summarized in table 7.

First, members give up their decision rights regarding inputs and price to director members. The cooperative requires standardization of production by members. What inputs are to be used, and how/when to use them are contracted ex ante between the cooperatives and members. For the cooperative, this is a method to control quality of

products; for the members, they like to give up such decision rights to gain technical guidance on how to produce and to acquire inputs such as fertilizers and seeds supplied by the cooperative at production costs. The members give up their decision rights regarding price because their production scale is small and the inefficiencies in information collection. For member growers, small production scale implies that it is costly to collect market information and it is hard to access markets. In contrast, the cooperatives have better capabilities to gather and analyze market information and a larger scale to gain access to markets.

	No extent or to a very limited extent	To some extent	To large extent
Input decision	×		
Quantity decision			×
Price decision	×		
Quality standards decision			×
Accounting system decision		×	
Advertisement decision			
Technology training decision			×
Investment decision			×
Financing decision		×	
Recruiting decision		×	

Table 7: Allocation of Decision Power to non-Director Members

Second, non-Director members are actively involved in making such decisions as quantity, quality standards, technology training, and investment. Quantity decisions are important for all members, because how much to produce will determine how much to contribute to the cooperative by buying shares. Normal members are motivated enough to participate in this decision. Regarding the high involvement of normal members in setting up quality standards decisions, it reflects that quality is now an important attribute of commodities. Since cooperatives are organized around one or several similar products, formulating quality standards is an important measure to regulate members' behavior and reduce the adverse selection problem.

It is not surprising that members are strongly motivated to take technical training decisions. In China, small farmer growers are lack of technology. As the market

condition changes from shortage of supply to abundance of supply, consumers demand high quality products or more customer-friendly products. To meet such changes, new technologies and technological innovations are required. Because small growers are keen on technological training, they are motivated to decide the training projects and training frequency. The result is that providing technology services is one of important measures to test the performance of Chinese cooperatives.

Third, financing decisions are mainly made by director members. This observation is a bit surprising, because normal members are expected to be cautious for financial issues in order to prevent risks and therefore are expected to tightly keep decision rights on financing. The reason is that normal members are too small to take a stake in financing and director members are normally larger growers who contribute a lot to financing issues. For example, the general director is a big grower, and his shares count for 20% of all shares.

In sum, in Yu-heng Watermelon Cooperative, ownership is restricted to members; members are required to buy shares; membership is closed; delivery rights are restricted; the ownership title is quasi-individual; director members have substantial power in deciding prices, inputs, finance, recruiting, etc; non-director members participate actively in making most decisions regarding quantity, quality, standards, investments, and technological training.

Income Rights

The cooperative will allocate the shares among members according to their planting scale, which in turn determine their expected patronization on the cooperative. Since the share allocation is set up before the production of watermelon, the expected patronization and consequently the payment for delivering for individual members are almost fixed. By combining delivery rights and share-holding policy, the cooperative aligns the principle

of patronization-based allocation with the principle of share-based allocation. Since member growers are required to purchase shares on the basis of expected patronage, the usage and the capital investment are perfectly aligned.

Members have rights to share the yearly net returns of the cooperative according to shares. Generally, some parts of the share yearly net returns will be retained within the cooperative for further development and public use, and the rest will be allocated to members according to their shares.

Complementarities between decision rights and income rights

Table 8 presents the values of the attributes of the governance structure in Yu-heng watermelon cooperative. Decision rights are not uniformly distributed among the members. Director members have real control on important issues such as pricing, financing, investment screening, etc. Meanwhile, sharing benefits/costs among members are not solely based on membership. Income rights are confined by share contributions.

Income rights / **Decision rights**	Share-based	Membership-based
Uniform		
Skewed	×	

Table 8: Attribute choices in the cluster Governance

In traditional cooperatives, benefit sharing based on patronization is essential for members, and capital returns are not important or deliberately limited to all members. In Yu-heng watermelon cooperative, ownership is allocated in such a way that benefit sharing based on patronization and benefit sharing based on capital contribution is perfectly aligned. Since members benefit from the cooperative proportional to their share contribution/expected patronization, a skewed allocation of decision rights encourages members either to contribute to the cooperative or to make knowledge / access to market channels available.

4.2 Quality control system

For agricultural products, as well as for other products, quality is an important attribute nowadays. We define the system a cooperative uses to direct behavior of its member users and to motivate them to act in ways that benefit the cooperative as the quality control system.

Quality coordination methods through multiple production stages

For the agri-business involved in multiple stages of production and distribution of products, vertical coordination on quality is necessary. Various methods could be used to vertically manage quality. We identify three quality coordination methods through multiple production stages in this cooperative: inputs control, production standardization, and unified packaging and marketing. Figure 2 illustrates the production stages involved by the cooperative and coordinating methods through these stages.

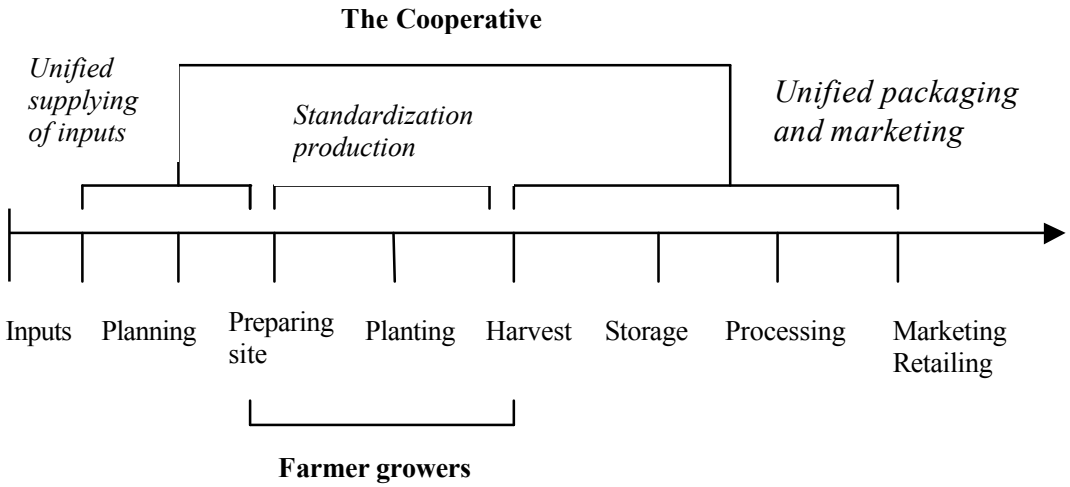

Figure 2 Stages of Production and Coordination methods

Although Yu-heng watermelon cooperative is a marketing cooperative, its activities are not limited to selling. The figure shows the cooperative is involved in multiple stages of inputs, storing, and processing and marketing/retailing. Yu-heng watermelon cooperative purchases inputs for members from outside companies. The procurement of inputs by the cooperative serves two purposes: firstly, quality of inputs is controlled;

secondly, members acquire inputs at cheaper prices because the cooperative has considerable bargaining power towards input suppliers.

Main activities of member growers are preparing sites, planting, and harvesting. The cooperative influences member growers' activities by production standardization requirements. Production methods, technical guidance, and detailed planting descriptions of production procedures are formulated by the cooperative.

Other control tools and incentive tools

In addition to unified supply of inputs, standardized production methods, and unified packaging and marketing, several other control instruments are identified. One control instrument is team based production / inspection. By working together on rural lands, member growers supervise each other. Production and quality management is organized in a three-layer structure. Figure 3 depicts this structure. The board of directors, on behalf of the cooperative, rents rural land each year and assigns members to grow watermelons on it. These lands are called 'production bases'. In each production base, member growers are grouped into 8 to 10 production groups. Each group hires farmer employees. Farmer members and workers grow watermelons together in a team. The cooperative provides inputs such as seeds, fertilizers and technical assistance. Farmer members provide technical guidance to farmer employees. At the end of one production cycle[7], each production base collects watermelons from its production teams. These watermelons are sorted, graded and packed with the cooperative brand. The board of directors determines prices based on the market situation. Subsequently, the cooperative assigns about two seller members to each production base. These seller members are in charge of selling watermelons for their production base.

[7] The number of production cycles is 6, due to its technology and skills. Most enterprises have 4 production cycles.

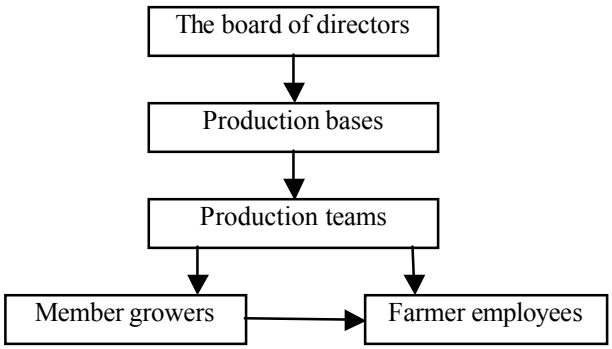

Figure 3: Quality management in Yu-heng watermelon cooperative

Second, the products delivered by members are sorted and graded by the cooperative. By sorting and grading, the cooperative encourages members to adhere to ex ante specified quality standards. Third, members will be paid for their deliveries based on quality. Sample inspection, internal grading and sorting are used to measure quality differences, and then prices are paid accordingly. Quality-based pricing for deliveries is a salient incentive tool used by the cooperative to align interests of individual members with the entire cooperative. Fourth, there is cash punishment for failing to deliver quality, even after the internal inspection process.

Complementarities in the quality control system

In Yu-heng watermelon cooperative, the control tools include inputs control (i.e. unified supply of inputs), standardization, unified packaging and marketing, group production/inspection, sorting and grading, and incentive tools like quality-based pricing and cash punishment. The control tools are less efficient when pricing for deliveries is identical across all members. Tight control tools and flexible quality-sensitive pricing act in the same direction to manage members to adhere to quality standards and maintain the brand name. Table 9 depicts the choices regarding the attributes in the cluster quality control at Yu-heng watermelon cooperative. Compared with contract farming, the cooperative has low costs in enforcing quality. For example, field visits are not necessary, because members are motivated to supervise each other to prevent opportunist behavior.

Low cost of control, complemented with high-powered incentives in terms of pricing, makes the cooperative efficient in managing quality in various stages of production.

Quality incentives / Control	Yes	No
Tight	X	
Loose		

Table 9: Attribute choices in the cluster Quality Control

There are ongoing debates on whether incentives and control tools adopted in the quality assurance system are substitutes or complements. Hueth, e.a. (2000) examined incentive tools and control tools used in the contracts used by first handlers of fruits and vegetables in California, and claimed that the instruments of control may be complements or substitutes, depending on the context. If the control instruments and the incentive instruments are complements, then their alignment produces synergies in the Quality control system. This is what we observed in this Chinese fruit cooperative.

4.3 Branding strategy and its enforcement mechanisms

A cooperative may choose different business strategies when selling products for members. We define the branding strategy as the way in which products are marketed and sold under brand name.

The branding strategy determines the degree of commitment to ex ante specified high quality standards by a firm. To make this commitment credible, firms should have something valuable to loose. In Yu-heng watermelon cooperative, this is the private brand 'Yu-ling'. There are two mechanisms to signal quality to consumers: private brands and public certification (Raynaud, e.a., 2005). The reputation capital of the owner is at stake under a private brand. The general director is a big watermelon grower and at the same time an expert in growing watermelons. Before he joined the cooperative, his watermelons were recognized as high quality. Many local people buy the watermelon from the cooperative because they trust the general director. His personal reputation is at

stake in building up the reputation for the 'Yu-ling' brand. Under public certification, the credibility of a quality label relies on governmental enforcement.

Since the two mechanisms play similar roles in signaling quality, they may act as substitutes. However, in Yu-heng watermelon cooperative, public certification is not a substitute to private brands. It acts as a major method for building up the reputation of the private brand. The cooperative entered the certification process of the local government, which resulted in 'Yu-ling' being certified as 'Famous Brand in Zhejiang' by the Zhejiang provincial government agency in 2004. One reason for public certification being a complement to private brands is that the costs of public certification are low. Actually, local governments encourage cooperatives to participate in public certification procedures. Another reason is that public certification is used in advertising in addition to the private brand. The general director stated that the advertisement expenditure on newspapers, television, etc is 'very limited', while pubic certification or public rewards are necessary for promoting brands. Table 10 summarizes the observations regarding the cluster Strategy.

Public certification / **Private brand**	Yes	No
Yes	X	
No		

Table 10: Attribute choices in the cluster Strategy

4.4 Complementarities between the three clusters of attributes

How to sell products and what products to sell are two questions closely linked with each other. The branding strategy distinguishes itself in terms of creating the commitment to ex ante specified high quality standards and creating a new market niche with higher margins. To guarantee the commitment and to earn high margins, tight quality control is essential in cooperatives taking the brand strategy. The adoption of these systems is

facilitated by having centralized / skewed governance. Figure 4 depicts the three clusters of attributes in Yu-heng watermelon cooperative.

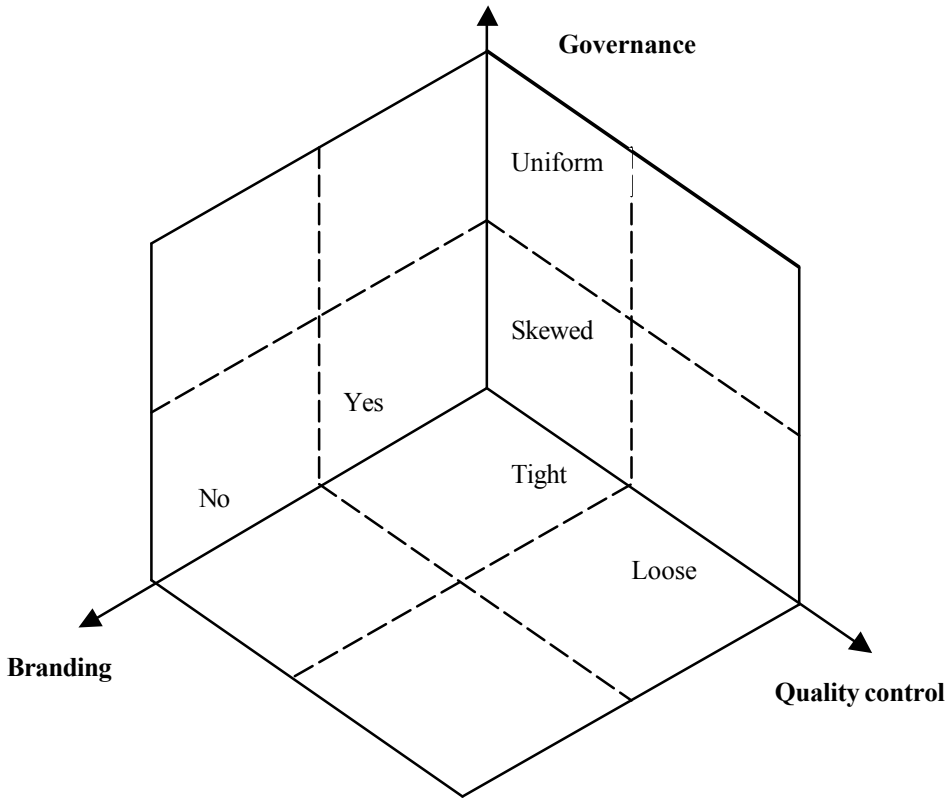

Figure 4: Cluster choices in Yu-heng watermelon cooperative

In Yu-heng watermelon cooperative, the quality control system is tight in order to maintain high quality reputation/image of the cooperative. It is tight in three ways. Firstly, there are ex-ante contracted quality standards, which are agreed upon by all members and which are stricter than the legal requirements regarding fruits. Secondly, many control tools are adopted to monitor and guide members through different stages of production. For example, input controls, production standardization, and group production/inspection are adopted to guarantee quality before and during the production process. Sample inspection and internal grading are used to measure members' efforts in meeting quality requirements. Failures of meeting quality requirements, which are not detected by the internal grading system, are dealt with by cash punishments. Since the bad products can be tracked down to production bases/groups, cash punishment provides a strong incentive

to grow high quality watermelons. Thirdly, quality-based pricing is used to complement the control tools.

5 Governance in the Institutional Environment of China: abilities and relations

The above sections show that the development of Chinese cooperatives is characterized by two facts. Firstly, the number of new cooperatives increases rapidly all over China. The emergence and spread of new cooperatives in China is in line with the wave of the agricultural industrialization and global competition. For farmers operating in only one stage of the supply chain, i.e. the production stage, their benefits are endangered by the potential appropriation by other players in the supply chain. The cooperative is a safeguard to guarantee farmers' benefits by creating access to markets and produce value-added activities.

In the process of forward integrating into downstream activities, such as wholesaling and/or retailing, physical assets such as preservation facilities and wholesale markets are important. However, human assets such as knowledge/abilities regarding marketing and advanced technology are more important for Chinese farmers. Firstly, the agri-food markets are now characterized by oversupply, i.e. selling products is a problem for most farmers. Access to markets is decisive for farmers' survival. Secondly, in rural China, it is very difficult for farmers to get loans from business organizations such as banks because their scale is small and they may pose substantial risks for creditors. Only farmers with access to knowledge regarding technology and/or markets can get loans. These farmers are able to grow more products and/or sell more products. They distinguish themselves from other farmers by larger planting and/or selling scale. These signals give banks and other private creditors confidence that their loans will be paid back. So, human assets pave the way to build up physical assets.

Secondly, the governance structure of Chinese farmer cooperatives is a co-governance structure based on abilities and relations. The actual arrangements and operations are mainly based on the abilities of members. Trust and commitment derived from members' relationships sustains these institutional arrangements by confining control rights to core members.

The governance structure of Chinese cooperatives varies substantially. Members are heterogeneous in terms of farm size and supply of equity, and in some cases farmer members jointly own the cooperative with non-farmer members or firm members. The allocation of resources based on capital is pervasive at least in the coastal areas. There is usually a minority of core members (usually big shareholders) and a majority of normal members (usually users or patrons). Normal members enforce control rights by vote, voice and exit on the one hand, and delegate most control rights to core members on the other hand.

Farmers are heterogonous in terms of producing and/or selling capability even when they produce similar products. Farmers are stratified in terms of their abilities in producing products and in accessing markets. Some farmers have these abilities, while most farmers have not. However, farmers are in general in a weak bargaining position with other players in the agri-food supply chain, regardless their abilities to sell products and to perform value-added activities. Uniting farmers and pooling resources in the formation of cooperatives seems to be a suitable strategy for both types of farmers.

According to the incomplete contracting theory, it's efficient to allocate the control rights of cooperatives to the persons with superior access to market channels or having specific skills. In China, these persons are big farmer growers and/or sellers because they have either the abilities or relations to access downstream markets. They are granted substantial power in decision making decision in contingent situations. This is reflected

in the skewness of the distribution of decision rights among core members/director members and normal members in the Zhejiang province. If there is a lack of big growers/sellers, agricultural firms and other non-farmers may be chosen and accepted by farmer members. The heterogeneity is much larger in this case, and the extent of the delegation of control rights to such core members is much larger. In some cases, normal members (pure farmer growers) only buy basic shares (i.e. membership shares) to get access to the cooperative, and most control rights are granted to big shareholders/core members. These diverse allocations of decision power among different stakeholders are confined by trust and commitment derived from the relationships among members. For small cooperatives, relationships play an important role in building trust and commitment. If core members have more close relationship with other members, normal members will be more willing to transfer (part of their) control rights to them. Thus, dominance of core members in ownership, and hence in residual control rights, is sustainable on the basis of kinships.

6 Conclusions

Since the late 1980s, China has seen the rapid development of new cooperatives in rural areas. In general, the development of farmer cooperatives in China is still in an early stage. They are small, and most of them are local.

The organization and strategy of farmer specialized cooperatives in China are deeply influenced by the institutional environment. Firstly, human asset specificity in terms of establishing and maintaining relations and access to markets seems to be more important than physical asset specificity in accounting for governance structure choice in the current institutional setting. The leader of a cooperative is chosen mainly by his ability to access to downstream activities. A non-farmer or process firm can be accepted as a core member as long as he facilitates members' access to knowledge and/or markets. Core

members/ director members are endowed with substantial decision power by normal members.

Secondly, farmer cooperatives in China are rooted in the Chinese traditional culture centering on personal relations. Therefore, the origin and development of cooperatives are not only determined by members' abilities but also subject to the informal institutions based on relations. A very effective way to conduct the governance of farmer cooperatives in China may not be formal institution of, and commitment to cooperative concepts, but the personal relations or feelings. In a sense, the network of cooperative members is an effective mechanism to control the core members. In short, both the control of core members based on ability and the constraints caused by members' relations can be regarded as the basic foundation for the co-governance of farmer cooperatives in China.

Heterogeneity of members in farmer cooperatives in China is pervasive. This raises the issue on structuring cooperatives in such a way that they accommodate member heterogeneity best. There are various types of heterogeneity. Firstly, small farmer members and large farmer members co-exist in a cooperative. They are different in terms of abilities and social relations. Secondly, in some cooperatives, there are seller members who are specialized in selling member's products instead of production, and they may have different interests than pure farmer growers. Thirdly, in the cooperatives initiated by processor firms or other agri-food business firms, farmer members as well as non farmer members have decision rights. Fourthly, there are cooperatives with full-time farmer members and part-time farmer having different interests. Finally, members are heterogeneous in terms of education, age, gender of members. The first three types of heterogeneity have been addressed by this article, but more research is needed to advance

our knowledge of the impact of member heterogeneity on the organizing and strategy of cooperatives.

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