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**Centralized versus Individual: Governance of Farmer Professional
Cooperatives in China**

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Abstract

Based on a national representative survey conducted in 2009, this study shows that the decision-making within Farmer Professional Cooperatives (FPCs) in China is decentralized to individual farmers. However, there is a trend that the decision rights of farming are decomposed to marketing, production and input procuring. While the rights for production and input procuring stay with family farmers, marketing rights tend to be collectivized. Compared to FPCs having external initiating sources, FPCs initiated by farmers are more inclined to introduce centralized decision-making. The governance structure of FPCs in transition China presents hybrid forms of both hierarchy and family farming.

Keywords: Farmer; Cooperatives; Governance, China

JEL classification: L14; Q13; Q18

1. Introduction

During the socialism era, millions of small peasant farms in China were replaced by large state or collective farms that were subject to central planning, although called “cooperatives”. Since the institutional reform in the late 1970s and market liberalization in years after, China’s rural economy experienced profound and rapid changes. LIN (1992) finds that about half of the 42.2 percent increase in total farm output in China between 1978-1984 can be explained by the institutional reform of decentralization that activated the household farming system. Individual decision-making of family farmers reduces the incidence of rural poverty and the figure fell from 30.7 percent in 1978 to 14.8 percent in 1984 (NSBC 2007). The decentralized decision-making under the family farming system facilitated the agricultural market liberalization, and such a market scenario helped to shield upstream farmers from rent extraction from the downstream industries (HUANG et al. 2007). To sum up, the institutional reform in rural China contributes to the majority of economic progress during the early reform period (DE BRAUW, HUANG, and ROZELLE 2004; JOHNSON 1998; LIN 1992).

Although the smallholder family farming contributed to the economic growth and rural development in the early reform period and facilitated the subsequent economic reforms, China faces a primary challenge of shrinking farm size, given the large rural population. The average size of a farm decreased to 0.54 hectare in 2003 from 0.73 hectare in 1984 (NSBC 1986-2008). Although there has been a slight rise in the average size of each farm due to the emerging land rental and exchange between farm households, the average size was still only 0.6 hectares in 2008.

Small farmers, traders, large scale commercial firms and government agencies all face substantial difficulties in accessing information and in working together in low cost and low risk agrofood systems (HAZELL et al. 2006; POULTON, DORWARD, and KYDD 2005). Small family farmers may find themselves difficult to get appropriate and reliable inputs and farming technologies. The mid- & down-stream buyers find the transaction in producing and marketing with vast number of small farmers too costly. Farm organizations become an institutional option for overcoming the transaction costs related to individual smallholder farmers (ROTTGER 2005). Motivated by the new market scenario since the 1980s, new farmer cooperative organizations emerged in many provinces of China in the late 1980s, and has been speeding up since the late 1990s.

The Chinese government attempts to restructure the agrofood system to a modernized one by supporting farmer cooperatives and associations (HAN 2007). On October 31st of 2006, the “Law of Farmer Professional Cooperatives” (FPCs) was passed in the Standing Committee of the 24th People's congress, and the law was promulgated in July 1st of 2007. The law confines cooperatives to providing service like purchasing agricultural inputs, marketing, processing, transportation, storage, agricultural technology and information.¹ It was reported that 2.9 percent of farmers and 10 percent of villages were covered by FPCs by 2003 (SHEN et al. 2005).² DENG

¹ Cooperatives’ function in providing finance and other social service are not declared though.

² The statistical figure of village coverage is misleading as there are both formal FPCs that are barely functional and FPCs that were not formally registered but provided functional services to

et al. (forthcoming) found 21 percent of China's village and county seats had FPCs in China and these FPCs provided services to about 24 million farm households in 2008. Although there are many factors that correlate with the emergence and development of FPCs in rural China, the role of government is of primary importance.

From collective "cooperatives" in the socialism era to family farming and then to farmer cooperatives, China seems to take a regressing tour of agrarian institutions. However, the recent emergence of farmer cooperatives and associations are far different from those in the socialism era. It has a much richer content of 'subsidiaries' in a variety of forms. The subsidiaries might be input providers, midstream processors, downstream retailers, brokers, or government forces that are embedded with any of them. The producer groups perform different tasks. Some jointly organize input and output marketing, and some make joint production and centralize the major tasks of farming. Accordingly, the governance structure of these emerging FPCs are quite differentiated, from highly centralized ones on the one end to fairly loosed ones on the other.

Historically, agriculture in both Western developed and developing countries is neither organized as large hired-labor farms nor as agricultural producer cooperatives. Farmer organizations are primarily subject to family governance (SCHMITT 1993: 155-157). Nevertheless, smallholdings are facing a systematic unfavorable situation in technology adoption, climate change, transformed agro-food market toward consolidated modern supply chains, and various uncertainties (DORWARD, KYDD and POULTON 1998; HAZELL et al. 2006).

Given the unprecedented situation Chinese farmers face, it is a crucial question whether the individual decision-making of small farmers is maintained with family farming governance or replaced with collective action of hierarchy. As an organizational hybrid, producer organizations are distinctive as the partners take jointly a part of decisions in their domain of choice. It is the interest of this study to demarcate the joint decisions. The empirical evidence is based on a national representative survey on 157 FPCs and the unique dataset provides the most updated observation and knowledge on the most recent development of farmer organizations in transitional China.

The article is structured as follows. Section 2 defines governance structure and distinguishes the influences on the internal governance of FPCs. Section 3 introduces data collection and describes the governance structure of FPCs. In section 4, we provide econometric analysis, and demonstrate the determining factors of the centralized decision-making within FPCs. Conclusions will be drawn in Section 5.

2. Conceptual underpinnings

2.2 Profile of organizational governance

Farmer cooperatives are considered by MENARD (2004) as one of the hybrids adopted in the agrofood system, besides markets at one end and hierarchies at the other end. Unlike market coordination in which decision-making is decentralized to individual farm and unlike hierarchies in which all the decision-making is centralized, farmers in cooperatives jointly make decisions but they mostly rely on decentralized

farmers. SHEN et al. (2005) decomposed the functional and formal farm associations and therefore found 7 percent of villages in China had function of FPCs.

decisions because of the high cost of closely monitoring the numerous partners involved in multiple tasks. The choice of governance structure by cooperatives has been investigated theoretically by HENDRIKSE (1998) and HENDRIKSE and VEERMAN (2001). HENDRIKSE claims that a switch from a cooperative to hierarchies does not occur when the industry is reduced. HENDRIKSE and VEERMAN (2001) predicted that farmer cooperative is an efficient governance structure when the increasing level of asset specificity is compensated for by a sufficient increase in the extent of production differentiation. When farmers predict opportunistic behavior of their partners, individual decision-making is chosen over joint decision-making and a loose governance structure emerges in the marketing cooperative.

Within farmer cooperatives, market governance that features individual decision-making is advocated when the degree of asset specificity is low. When asset specificity is increasing due to the increasing prominence of the hold-up problem, centralized decision-making emerges as in hierarchies. Fig. 1 summarizes these concepts. The level of asset specificity k is on the horizontal axis and the cost of governance structure on the vertical axis. The costs of different governance structures as a function of the level of asset specificity are depicted. $M(k)$ represents the cost of market governance with individual decision-making. $H(k)$ are the governance costs of centralized decision-making in hierarchies. $X(k)$ represents the joint decision-making in farmer cooperatives. The figure implies that for projects with different level of asset specificity, the cost of governance structure in a farmer cooperative varies and there exist multiple trajectories.

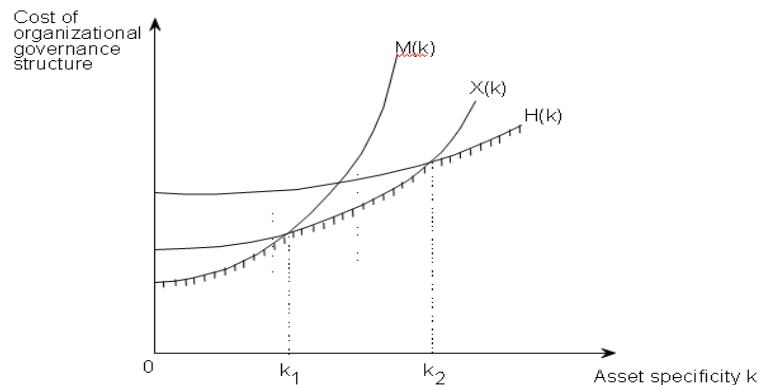


Fig. 1. Governance structure and asset specificity (WILLIAMSON 1991)

2.2 Factors determining governance structure of farmer cooperatives

A governance structure consists of both decision rights and income rights (HANSMANN 1996). Decision rights concern all rights and rules regarding the deployment and use of assets. They specify who directs the firm's activities. Income rights delineate incentives. They specify who appropriates the net earnings of the firm. We follow HANSMANN (1996) by distinguishing decision rights and income rights of a FPC. The allocation of decision rights can be quite differentiated. At one extreme, farmers give up most decisions regarding cropping, marketing and/or processing. At the other extreme, all these decisions reside with individual farmers.

According to WILLIAMSON (1985), four levels of institutional analysis can be distinguished. 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. *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 framework of 1-10 years. *Resource Allocation and Employment* deals with prices and quantities as well as incentive alignment. Changes take place continuously.

Williamson's scheme guides our search for the potential determinants of the allocation pattern of decision rights of FPCs in China from two levels, that is, the economic rationale (level 3) and the political will (level 2).³ The economic rationale consists of attributes of agricultural products, quality labeling strategy, and spatial coverage of membership. These factors distinguish a transaction from others, and governance structures are expected to align with them.

Asset specificity, uncertainty and transaction frequency are three dimensions of measuring transaction costs for a certain transaction (WILLIAMSON 2002). Different agricultural products may involve different transaction costs caused by their biological attributes. For example, although agricultural products in general are subject to seasonal factors and are perishable, they differ from each other. Staple crops such as wheat and cotton are less perishable and easier to store, compared with fresh vegetables and fruits. For the perishable products, farmers making specific investment at farm gate are subject to the hold-up problem in negotiating price with large processing firms and thus are motivated to form marketing cooperatives (HENDRIKSE and VEERMAN 2001). It implies that for more perishable products, decision rights regarding marketing are inclined to be shifted from individual farmers to a cooperative collective. Certain biological characteristics of agricultural products demand high frequency of transaction. For high transaction frequency, market coordination is less appropriate since too much transaction costs occur. For example, for dairy products, farmers need to sell milk every day and thus it is beneficial to cooperate in joint marketing. In sum, we expect that the allocation of decision rights varies across different agricultural products.

Quality labeling is adopted in many agricultural chains signaling high quality, and both private brands and public certification are well-observed devices for assuring quality (RAYNAUD, SAUVEE and VALCESCHINI 2005). Private brand names are actually the commitment to *ex ante* specified high quality standards by a firm. The commitment created by brand names is credible because the reputational capital of FPCs is at stake under a private brand. Public certification is another option for assuring quality. However, under public certification, the credibility of quality label relies on government enforcement. For the products with brand names or certification, specific investments have been made at the processing and/or marketing stage of production.

FPCs taking the quality labeling strategy, either by registering private brand names or by acquiring public certification, tend to centralize decision rights of individual farmers, in order to deal with the incidence of moral hazards. The empirical research on automobile franchise contracts shows that the variation in the allocation pattern of decision rights is driven by potential *ex post* opportunism by

³ Social dimension at level 1 may also influence the governance of a FPC. However, the analysis on such factors is beyond this study.

both dealers and manufacturers, and manufacturers of higher quality cars are allocated more control and monitoring rights over dealer's actions since dealers are inclined to damage the contract more in this situation (ARRUNADA, GARICANO and VAZQUEZ 2005). *Ex post* opportunism is also pervasive for both upstream farmers and downstream processing firms in agricultural networks, and many decision rights by farmers are shifted across the network to the downstream firm dealing with high quality products (HU and HENDRIKSE 2009). We expect a similar causal link to exist in the governance of FPCs.

Spatial coverage of membership matters in determining the governance of FPCs, from the perspective of membership heterogeneity. Cooperatives help farmer members catch the benefit of scale economies, get access to the market, technology and capital, and lower risks (SEXTON and ISKOW 1988). However, various aspects of the governance of cooperatives, such as collective decision making, are tailored towards homogeneous members (HANSMANN 1996). As heterogeneity of member increases, the efficiency of cooperatives is jeopardized (LEVAY 1983; COOK 1995; CHOI and FEINERMAN 1993; KARANTININIS and ZAGO 2001; HENDRIKSE and BIJMAN 2002; HENDRIKSE 2006). Membership confined to a local level and producing similar products suffers less from the heterogeneity problem. Centralized decision making is favored since it is easier to coordinate farmers' activities and to maintain members' commitment within local communities.

Political will also play an important role in framing the allocation pattern of decision rights of FPCs in China. The governance structures of FPCs are embedded in the institutional environment and can not be chosen independent of institutional factors. We approach the political determinants by considering the legal framework established, political propaganda of new agribusiness mode, and the initiating role played by the government.

Laws facilitate operation of firms. It is a common practice in developed countries to enact cooperative laws. Once issuing the cooperative law, cooperatives are entitled with legal status. It reduces the uncertainties faced by cooperatives when dealing with other firms. Farmers' may be motivated to join a cooperative and/or delegate more decision rights to cooperatives since their ownership status is guaranteed by the law. We expect to see more cooperatives as well as an increasing incidence of centralized governance of cooperatives under the legal framework.

It is china-characteristic that the Chinese government may directly influence the operation of farmer cooperatives. One factor is that local governments are involved in initiating farmer cooperatives and associations. Abuse of authority and insufficient institutional supports coexist in agricultural sectors (XU and HUANG 2009). As a result, farmer members either quit or refuse to delegate decision rights. On the contrary, if capable farmers, who are rural elites of wealth, respect and knowledge, initiate cooperatives, members have less fear for hold-up. In sum, the FPCs with the initiating source by the government tend to leave farmers make most decisions while the FPCs initiated by farmers tend to take centralized governance. The other factor is that the government actively propagandizes the new agribusiness mode such as firm-farmer. Farmer cooperatives are encouraged to take advantage of the new agribusiness mode by becoming a production base (*sheng-chan-ji-di*) for a big agribusiness. For the FPCs linked to new business mode, farmers are inclined to devolve some rights, particularly marketing.

In sum, both economic rationale and political will determine the governance structure of FPCs in China.

3. Survey Data and Descriptive Analysis

3.1 Survey, sampling and terms

The data used in this study are from a national-wide survey in 5 provinces in China. The first survey was conducted in the late 2003, collecting primarily 2003 data in 6 provinces⁴. Within each province, all counties were sorted in descending order of gross value of industrial output per capita, and two from each tercile of listed counties were selected from each stratum.⁵ Finally, 6 counties were selected in each province. The same strategy applies to the selection of township in each county; six towns were selected and, in each town, we asked all villages sent two representatives (typically the village leader and accountant) for a questionnaire-based survey at the village level. In total, 2459 villages were surveyed.

In each village survey, the two village cadres were asked whether any farmer in their villages participated in any FPC, including those that were not based in their village and outside the boundaries of their village. In the case that the answer was “yes”, a set of questions (for example, the legal status, initiation, major functions) was presented.

The second round survey was conducted in 2009 to investigate the development status of FPCs in 2008. Considering the increased survey costs related to the FPC survey, in the second round survey, we drew a sub-sample from the first one. We surveyed 5 provinces and, in each province, the six sampled counties (from the 2003 survey) were grouped into 3 tercile and we select one in each tercile.⁶ In each county, the six sample townships (from the 2003) survey were sorted into two groups (viz. poor and nonpoor); we then drew one in each group. Finally, the second round of the survey in 2009 covered five provinces, fifteen counties, thirty townships and 380 villages. The empirical evidence in this study is drawn from the second round survey.

In the second round survey, we asked the village cadres “Is there any farmer in your village currently participating (and historically participated) in any registered or non-registered farmer professional cooperatives or associations that may not necessarily be in the residential villages?”. If the answer was “Yes”, rather than

⁴ More details about first round survey are available in DENG et al. (forthcoming) and SHEN et al. (2005).

⁵ Gross value of industrial output per capita (GVIO/capita) was found as one of the best predictors of living standards and development potential (ROZELLE 1996).

⁶ We divide China’s major agricultural production provinces into five groups: the eastern coastal areas (*Jiangsu*, Shandong; Shanghai, Zhejiang, Fujian, Guangdong and Hainan); the southwestern provinces (*Sichuan*, Guizhou, Chongqing, Yunnan, Tibet and Guangxi); the Loess Plateau and the northwestern provinces (*Shaanxi*, Shanxi, Inner Mongolia, Gansu, Ningxia; Qinghai and Xinjiang); the north and central provinces (*Hebei*, Henan, Beijing, Tianjin, Anhui, Jiangxi, and Hunan); and the northeastern provinces (*Jilin*, Liaoning and Heilongjiang). The first province in italic within the parenthesis is selected as a representative province of the group. While we recognize that we have deviated from the standard definition of China’s agroecological zones, the realities of survey work justified our compromises. Pretests in Guangdong demonstrated that data collection was extraordinarily expensive and the attrition rate was high. Our budget did not allow us to add another central province (e.g., Hunan or Hubei) to the sample.

surveying the village cadres about the FPCs at the village level (as we did in the first round survey), we traced the FPCs and surveyed the FPC heads after identifying them in the village survey. A separate questionnaire was used to investigate the initiation, the managed products, internal governance structure, the provision of inputs and other technical services, the provision of marketing and other services, and the personal data of FPC heads. In total, we surveyed 189 FPCs and found 157 of them have specific products. In this study, we term FPCs when they have specific product(s).

In the survey for FPC presidents, we asked them how the marketing, farming and likely residuals were organized and governed. Marketing is defined as centralization when FPCs balance the billing of transactions collectively and members pay (or receive) the money with FPCs individually. ‘Bridge marketing’ or ‘service marketing’ is termed when FPCs provide the information and service to members who will bill with input sellers or output buyers directly; FPCs may or may not charge fees during the process. When FPCs provide null service of input and output marketing, we term them as ‘individualism’.

Centralized production refers to the governance under which FPCs standardize the farming activities and members are required to conform to the production rules. Terming this is challenging because the production complexity for different products is distinct and it is difficult to compare them. For example, the production stage and farming tasks of greenhouse vegetables and dairy farming are totally distinct. As such, we asked the FPC presidents how the farming was organized for the major farming activities at different production stage. For example, for livestock FPCs, we asked mainly the feeding and daily watch. For vegetables, we asked the nursery, watering, pruning and planting etc. In the case that one of them was marked as “centralized”, we define the FPCs having centralized production.

Only one third of surveyed FPCs have member equity and 85 percent (46 out of 54) specified rights of residual claim based on equity. The rest are either FPCs having no FPC residual or limiting members’ right to claim the residual. In this study we term ‘residual claim rights’ when FPCs had member equity and members can get dividend from the residuals.

3.2 Descriptive analysis

3.2.1 The emergence of FPCs in China: When and who

Legal framework. Before 2007, the lack of a clear legal status was one of the main constraints to the development of FPCs in China (WORLD BANK 2006). Various government departments (such as the Ministry of Agriculture, Ministry of Civil Administration, State Administration for Industry and Commerce, Science and Technology Association) had all been involved in the administration. The 2007 law clearly names the Industrial and Commercial Bureau as the authorized institution for registration. The Agricultural Bureaus at the county level (or higher) are responsible for supervising FPCs’ operation. As shown in Table 1, 60 percent of the surveyed cooperatives and associations – 94 out of 157 – are registered to the Industrial and

Commercial Bureau, and 82 percent of them were initiated after 2007. The legal framework facilitates the development of FPCs in rural China.⁷

Table 1 At which agency were the FCOs registered?

	Initiation Year (%)				Total sample
	<=1998	(1998, 2003]	[2004, 2007)	>=2007	
Civil Affairs Bureau	0	7	53	40	15
Industrial and Commercial Bureau	1	3	14	82	94
Rural or Agricultural Affairs Office	0	0	0	100	8
Science Association	14	29	43	14	7
Others	0	33	0	67	3
Non-registration	7	10	43	40	30
Total sample	4	10	37	106	157

Note: The figures in the table body are percentage in row.

When. The development of farmer cooperatives and associations in rural China has experience four stages since the late 1980s. There were quite a few farmer cooperatives before 1998, and there was an accelerated increase during 1999 and 2003. SHEN et al (2005) found 40 percent of the surveyed farmer associations were established during this period. In our study, 9 percent of the FPCs are established before 2003 and most of them were initiated during 1999 and 2003.

A systematic promotion on farmer associations occurred in 2004. We find 24 percent of FPCs were established during 2004 and 2006. Finally, when the “Law of Farmer Professional Cooperatives” was promulgated on July 1st of 2007, the legal framework creates an environment conducive to the development of FPCs. As shown in Table 2, 68 percent of the surveyed FPCs were established after the introduction of the formal legal framework. The policy support is decisive on the growth of FPCs in China (DENG et al. forthcoming).

⁷ It is not rare that registration of FPCs to an agency (or more than one agency) is to qualify for support from various sources. The national campaign on “Farmers Cooperative Organizations” and increased financial support from various government agencies amplify and distort the incentive of initiating cooperatives and associations. In the survey, we found a few “empty-shell” cooperatives that provide null service to members, but for receiving preferential support from government.

Table 2 Initiation and governance of FPCs in China

	Total		Input Purchase			Marketing			Centralized Production (%)	Has Residual Claim rights
	Sample	pct. (%)	Centralized	Bridge	Individual	Centralized	Bridge	Individual		
Total sample	157		26	75	56	36	80	41	26	46
Initiating year										
1994-2003	14	9	5	4	5	1	10	3	5	5
2004-2006	37	24	2	22	13	6	17	14	2	7
2007-now	106	68	19	49	38	29	53	24	19	34
Initiated by...										
Government	44	28	6	13	25	5	22	17	6	8
Government+Farmers	57	36	8	33	16	9	36	12	10	14
Farmers	33	21	6	19	8	13	11	9	6	13
Enterprises	23	15	3	13	7	9	11	3	3	11

Note: The figures in the table body are incidence of sample.

Who. The role of government in the initiation of FPCs is evident. As shown in Table 2, 64 percent of the surveyed FPCs had initiating sources related to the government – 28 percent from government exclusively and 36 percent from the coalition of both government and farmers. The presence of the government in initiating FPCs in China was regarded as “too much enthusiasm” and some commentators posit that local government officials in rural China view the performance of promoting FPCs as the quantitative targets for evaluating their work (WORLD BANK, 2006). Nevertheless, in this study, we find the potent promotion from the government has been responded to at grass-roots basis; 21 percent of the surveyed FPCs reported initiating sources from farmers, some of which were the emerging group of specialized farmers. In addition, 15 percent of the surveyed FPCs had initiating sources from agricultural enterprises. FPCs become a new mode of agribusiness.

3.2.2 Decision-making and income rights of FPCs in China

While FPC farmers in China take collective action to form their own organizations that assist them in meeting challenges associated with the industrialized and commercialized market in agriculture, in fact, the decision-making in FPCs in transitional China is highly individualized. The bundle of decision rights consists of the rights of procuring inputs, the rights of marketing outputs, and the rights of production. Income rights refer to the right of residual claim.

Production is defined as centralized when a FPC sets up uniform standards and requires all the members to conform to them. When looking at the rights of procuring inputs and marketing outputs, we observe three modes: *centralized marketing*, *service marketing (or bridge marketing)*, and *individual marketing*. For *centralized marketing*, FPCs procure inputs or (and) outputs and market them collectively. For *service marketing*, FPCs provide market information to members who ship the inputs and products by themselves; FPCs may charge fees from either members or the buyers. In this case, FPCs function as a broker. Loosely organized, FCOs with *individual marketing* do not provide any service for marketing inputs as well as outputs. Farmers are left to market at the auction price.

In Table 3 we describe the decision making as well as income rights of FPCs in China. Nearly half of the surveyed FPCs function as marketing brokers; 80 (out of 157) transmitted the marketing information of inputs and outputs to farmers who ship the inputs and products by themselves. Although minor, we do observe 17 percent of centralized input purchasing via FPCs and 23 percent of centralized output marketing, respectively. Almost 16 percent of the surveyed FPCs (i.e., 25 out of 157) centralized or standardized the farming process, and they presented very low individualism of marketing at the same time. However, centralized production is mirrored with centralized marketing. For the 25 FPCs that centralized production, only 8 percent of them adopted individual input marketing and 4 percent individualized output marketing.

Table 3 Governance of FPCs in China

	Total	Input Purchase			Marketing Outputs		
		Centralized	Bridge	Individual	Centralized	Bridge	Individual
Sample	157	26 (17)	75 (48)	56 (36)	36 (23)	80 (51)	41 (26)
Has share	54 (34)	15 (28)	30 (56)	9 (17)	27 (50)	21 (39)	6 (11)
Has residual claim	46 (30)	15 (33)	26 (57)	5 (11)	26 (57)	17 (37)	3 (7)
Centralized production	25 (16)	8 (32)	15 (60)	2 (8)	13 (52)	11 (44)	1 (4)

Note: The figures in the parentheses are percentage in row.

Income rights within FPCs were delineated by equity investment and residual claim rights. We find 34 percent of the surveyed FPCs (i.e., 54 out of 157 FPCs) required members buy shares, and 29 percent of the FPCs assign the rights of residual income to farmers. It reflects the fact that farmers in China do not attach much importance to the rights of residual income. What they concern most is knowledge as well as access to market channels. The FPCs satisfying such needs is sufficient for them, regardless of the delicate design of income rights. However, two tendencies are worthy mentioning.

Firstly, rarely did FPCs in China marketed individually when there was equity investment and related members' right of residual claim. For the 54 FPCs having member equity, only 17 percent marketed inputs individually and 11 percent marketed outputs individually. FPCs with centralized marketing are organized more like a hierarchy with commitment of equity investment. For example, for the 26 FPCs with centralized input marketing and 36 FPCs with centralized output marketing, there are 15 and 27 FPCs that have equity investment respectively, and most of them could claim the residual at year end. Secondly, newly initiated FPCs are more inclined to require farmers to make equity investments and to hold residual claim rights. For example, for 46 FPCs whose farmer members hold residual claim rights, 74 percent of them were initiated after 2007 (see table 3).

In sum, the three different modes regarding marketing activities reflect distinct governance structures of FPCs. For individual marketing, there is no statutory obligation to market all inputs and outputs through the cooperative. The cooperatives are free from the strategic behaviors of members in the case of the contracted prices being lower than that in the auction market. For the 'bridge' marketing (or service marketing), the governance is relatively more loose than that with centralized marketing, and the member still hold some rights when deciding whether to abide by the rule. The centralized marketing means farmers delegate the decision rights regarding marketing out to farmer collectives.

3.2.3 Initiation status and Governance of FPCs in China

In Table 2, we decompose the decision-making by the initiating time and the initiating sources to investigate the likely correlation. When looking at FPCs with centralize decision-making (in column), most of them were initiated after 2007; there is a trend of centralized decision-making within FPCs in China. However, when

looking at FPCs initiated after 2007 (in row), service marketing and individual marketing are still dominating.

Initiating sources seem to be related with the governance structure of FPCs. When FPCs had external initiated sources (namely, government solely and enterprises), the incidence of centralized governance is lower than those FPCs having initiating sources of farmers. External initiating sources from both government and enterprises do not enter the decision making process within FPCs. This is easily understood. Although external sources play an important role in initiating FPCs (Deng, et al., forthcoming), they could not substitute for member farmers, who have the information advantages over any external source.

3.2.4 Membership and Governance of FPCs in China

The membership of the surveyed FPCs is by and large within the township boundary. As shown in Table 2, 47 percent of the FPCs were within local villages and 27 percent were within local townships. Spatial coverage of membership seems to be related with the governance structure of FPCs. For example, for the 26 FPCs that centralized input purchase, 12 of them had membership only within local villages; and the same correlation applies to the decision-making of production.

When the membership stretches outside local townships, centralized input purchase and production seems to be difficult to be maintained. However, centralized marketing is inclined to be adopted instead. As shown in Table 2, for the 36 FPCs that centralized marketing, 15 of them were outside the local township. The ratio is quite low in the centralized decision-making of input purchase and production.

FPCs in transitional China are not exclusive. Nearly half of the surveyed FPCs provided services to ‘client members’ who in some cases differentiate themselves from ‘formal members’ only in the registration status and related voting rights (Table 4). As shown in Table 4, the median size of client members is larger than that of the formal ones (or registered members).⁸ While the size of membership presents variation (due to initiating sources and products) and may not be comparable, we create the variable of the percentage of formal member to the whole serviced members. Interestingly, we find that FPCs with centralized farming activities provided exclusive services to only formal members. However, this is not a determining relationship as FPCs having no client members also engaged in active individual marketing of both inputs and outputs.

⁸ The size of formal membership may be underestimated. When FPCs update their formal membership at the Industrial and Commercial Bureau, they need to collect the full fingerprint of all the formal members. Such a work is time consuming and troublesome in rural China. As such, FPCs may not update the membership at ICB and the surveyed number may be understated, although we asked the enumerators to explain this to the FPC presidents.

Table 4 Membership and governance of FPCs in China

	Total		Input Purchase			Marketing			Centralized Production	Has Residual Claim rights
	obs.	pct.	Centralized	Bridge	Individual	Centralized	Bridge	Individual		
Total sample	157		26	75	56	36	80	41	26	46
Spatial coverage										
Within village	74	47	12	32	30	10	40	24	18	21
Other villages within township	43	27	6	19	18	11	19	13	1	9
Outside township	40	25	5	27	8	15	21	4	6	16
Size of membership										
Formal Members at initiating year (Median)	157	23	26	18	30	14	29	15	18	17
Client member at initiating year (Median)	80	35	30	35	43	80	33	35	108	28
Median Percentage of formal member to total (%)	157	88	76	83	100	88	92	83	100	88

3.2.5 Product Attributes and Governance of FPCs in China

Although having a wide range of products, FPCs in China are primarily found in high-value-added sectors, viz. vegetables and livestock products. Approximately 43 percent of the surveyed FPCs engaged in livestock sector and 41 percent of the sample engaged in horticultural sector, including greenhouse vegetables and orchard fruits (Table 5). Interestingly, centralized marketing occurs mostly in the high value added sector, for example, livestock and vegetables.

3.2.6 New Vertical Coordination Mode and Governance of FPCs in China

The governance of FPCs seems to have minor correlation with the transformed agrofood system and the new agribusiness mode in China. Since 2003, the Chinese government at every level strongly supports the development of a new agribusiness mode called “Firm-Farmers” to reach economies of scale and to strengthen the coordination of the agro-food supply chain (WALDRON 2009). The dominant type of firm is the so-called “dragon-head-driven” companies that are expected to channel technology to farmers and to stabilize farmers’ access to high-value added markets. Although it was found in some studies that contracting introduced vertical coordination along the agrofood chain (GUO, JOLLY and ZHU 2007), we in this study find very minor effects of such new agribusiness modes on the internal governance of FPCs. FPCs function more like a broker and the new agribusiness mode has not introduced hierarchy into the agrofood system.

3.2.7 Quality Labeling Strategy and Governance of FPCs in China

Although the agrofood system in China is transformed toward modernized and industrialized, there is minor penetration at the farm gate via FPCs. Although brand and certification are important reputation specificity for FPCs to realize value-adding and strengthen the farmers’ ownership along the agrofood chain (HENDRIKSE and BIJMAN 2002), only 17 percent and 18 percent of FPCs had their own brand and quality certification (Table 5). For this group of FPCs, very few of them centralized input purchase and production. But they tend to centralize the marketing of outputs. As we know, marketing itself does not change the quality; the emergence of the transformed agrofood system and the new agribusiness mode via FPCs do not enter the production stage, and the content of output marketing and production seems to be disconnected.

Table 5 Product attributes, quality labeling, new business mode and governance of FPCs in China

	Total		Input Purchase			Marketing			Centralized Production (%)	Has Residual Claim rights
	obs.	pct.	Centralized	Bridge	Individual	Centralized	Bridge	Individual		
Total sample	157		26	75	56	36	80	41	26	46
Product										
Livestock	68	43	9	33	26	15	36	17	5	16
Aquatic	12	8	1	5	6	3	4	5	4	6
Grain	12	8	0	7	5	3	5	4	4	4
Vegetables	46	29	9	25	12	12	21	13	5	14
Orchard fruits	19	12	2	10	7	3	14	2	7	6
Brand	27	17	3	19	5	14	8	5	4	11
Certification	28	18	4	19	5	10	11	7	6	8
Production base	37	24	9	20	8	7	28	2	5	12
Dragon-head companies	42	27	7	26	9	12	28	2	8	16

Note: The figures in the table body are incidence of sample.

4. Econometric Analysis

Based on the second round survey, we created a cross-section database with 157 FPCs. The dependent variables are the incidence of decision rights of input procuring, production and output marketing. The explanatory variables are grouped into the economic rationale and the political will. The economic rationale consists of attributes of agricultural products, quality labeling strategy (brands and/or certificates), and spatial coverage of membership. The political will consists of initiating year, initiating sources, and externally introduced new agribusiness mode. The expected relations have been elaborated in the section 2. We used Logit model to determine the decision-making of FPCs in China.

Attributes of agricultural products significantly affects the allocation of input procuring decision, while have no effect on the allocation of marketing decisions as well as production rights. The dummy variable for livestock, aquatic and fresh vegetables are positive and significant (at a 1% level of statistical significance). (model I). It is interesting to note that the centralized input purchasing more likely to occur in high value added sectors where the farming process is highly labor intensive, demanding frequent marketing of both inputs and outputs with a wide range of varieties. Centralized input procuring places the producer cooperatives in a favorable information environment. It is surprising to find that attributes of products have no effect on allocation of marketing decisions (model III) since for certain products centralized marketing would reduce transaction costs. For example, FOSS (1996) pointed out that, in fresh vegetable sectors, the technological scheme of measuring and sorting is one way in which transaction costs can be reduced.

As an important reputation specificity in the modern agrofood supply chain, the branding strategy of FPCs in China enhances the centralized output marketing (Model III) but it has no effects on the decision making of input purchasing and production (Model I and V). FPCs' certificating their products to certain quality and food safety standards, however, affects none of the governance structure of FPCs. Public certification is more like an advertising strategy and has no effects on the governance of the agrofood supply chain via FPCs.

Spatial coverage of the membership affects the decision-making of input purchasing and output marketing, but in a different direction. When the spatial coverage of FPCs is confined within local villages, centralized input purchasing tends to be used when the transaction costs for individual transaction are prohibitive (Model I). However, to be successful in collective action of centralized output marketing, the economies of scale matter as the buyers find it is more efficient to organize centralized marketing for FPCs with a wider spatial coverage; the coefficient of the dummy for spatial coverage of 'within local village' is significantly negative (Model III). Collective marketing of output is limited at the local village level.

Newly initiated FPCs after the introduction of the legal framework in 2007 are active in organizing collective marketing of output and in providing service of input purchasing (Model II and III), although the extent of centralization is relatively small in the latter.

Initiating sources affect the governance structure of FPCs in China. As shown in Table 6, compared with FPCs initiated by government exclusively, FPCs having initiating sources of farmers are inclined to achieve collective action by centralizing

the decision making of input purchasing. The dummy variables for initiating sources of ‘government + farmers’ and ‘farmers’ are positive and significant (at a 5% level of statistical significance). Particularly, when FPCs were initiated by farmers exclusively, FPCs tend to centralize both output marketing and production (Model II, III, V). Compared to FPCs initiated by the government exclusively, initiating sources from agricultural enterprises do not affect the decision-making of both marketing and farming.

As the Chinese government attempts to restructure the traditional low-value added agrofood chain in China to a modern one by enhancing the vertical coordination between the upstream farmers and the mid- & down-stream segment along the agrofood chain, we do observe a significant influence on the decision-making of marketing in FPCs in China. However, such an externally introduced mode of “agro-industrialization” does not affect the decision-making of both input use and production. When a FPC becomes a ‘production base’ for agricultural enterprises, the FPC function more like an advanced broker to ‘bridge’ the marketing exchange between individual farmers and the enterprises (Model IV). When a FPC is marketing with a ‘dragon-head’ company that reaches certain scale and quality standards, then neither were the production rights affected. The ‘dragon-head’ companies seem to organize collective output marketing rather than organizing the input and farming (Model III).

Table 6 Determining the decision-rights and income rights of FPCs in China

	Input Purchase		Output Marketing		Centralized Production
	Centralized	Bridge/ Service marketing	Centralized	Bridge/ Service marketing	
	(I)	(II)	(III)	(IV)	(V)
Product dummy for livestock	18.585*** [0.875]	-0.538 [0.735]	0.495 [0.923]	-0.069 [0.716]	-1.817** [0.925]
Product dummy for aquatic	17.859*** [1.363]	0.095 [0.940]	1.100 [1.198]	-0.520 [0.938]	1.051 [1.089]
Product dummy for vegetables	18.920*** [0.918]	-0.674 [0.758]	0.010 [0.914]	-0.245 [0.737]	-1.391 [0.928]
Product dummy for orchard fruits	17.871 .	0.051 [0.849]	0.042 [1.127]	0.946 [0.865]	0.681 [0.964]
FPC has brand	-0.159 [0.811]	0.668 [0.625]	2.143*** [0.718]	-1.524** [0.697]	-1.367 [1.014]
FPC certificate product to certain quality standards	0.954 [0.732]	0.188 [0.586]	-0.481 [0.741]	0.300 [0.606]	1.116 [0.890]
Dummy for spatial coverage: Within township	1.686** [0.743]	-1.411*** [0.520]	-1.437** [0.605]	-0.066 [0.502]	0.746 [0.673]
Dummy for spatial coverage: Other villages within township	1.275 [0.792]	-1.207** [0.542]	-0.571 [0.630]	-0.145 [0.537]	-1.708 [1.174]
Ratio of formal members to total	-0.009 [0.007]	-0.002 [0.005]	-0.002 [0.006]	0.002 [0.005]	0.002 [0.008]
Initiating year	-0.147 [0.100]	0.142* [0.083]	0.387** [0.196]	0.012 [0.086]	0.247 [0.175]
Dummy for initiating source of government and farmers	-0.051 [0.627]	1.145** [0.466]	0.363 [0.665]	0.441 [0.459]	0.787 [0.718]
Dummy for initiating source of farmers	0.403 [0.729]	1.151** [0.543]	1.246* [0.676]	-0.654 [0.543]	1.576* [0.854]
Dummy for initiating source of enterprises	0.916 [0.923]	-0.060 [0.664]	0.431 [0.776]	0.378 [0.682]	0.976 [1.050]
FPC contract with agribusiness as “production base”	0.791 [0.567]	0.151 [0.449]	-0.423 [0.576]	1.366*** [0.491]	-0.065 [0.689]
The downstream buyer of FPC is “dragon-head” company	0.630 [0.546]	0.243 [0.427]	0.933* [0.526]	0.397 [0.444]	0.670 [0.613]
Constant	273.875	-284.601*	-778.485**	-24.402	-498.378

	[199.848]	[166.175]	[394.388]	[173.000]	[350.858]
N	157	157	157	157	157

Note: Standard errors in brackets * $p < .10$, ** $p < .05$, *** $p < .01$

5. Conclusion

This study aims to investigate the internal governance of FPCs in transitional China. The empirical analysis is based on a national representative survey on 157 farmer professional cooperatives in China. We first describe the decision rights and income rights of FPCs in China, and then determine the decision-making pattern of FPCs' on two groups of factors including both the economic rationale and the political will.

The main research findings are summarized as follows. First, the governance of FPCs in China is retained on the base of the owner-operator system in which decision rights are decentralized to family farmers. However, there is a trend that FPC farmers may devolve the decision rights of marketing of input and output to the FPC collectives. Second, attributes of agricultural products affect the governance of FPCs in a less important sense. High-value added products tend to induce the shift of input decisions from farmers to cooperatives. Third, the quality labeling strategy affects the allocation of decision rights with FPCs, but it depends on which enforce tool FPCs choose. Private names enhance the centralized output marketing, while public certification affects none of the governance structure of FPCs. Certification acts more like an advertising strategy and has no effects on the governance of the agrofood supply chain via FPCs in China.

Fourth, the FPCs in China are still small and local, being confined to local villages. The informational advantage of local governance promotes the collective action of input purchasing, and FPC farmers may find it is more efficient to buy agro-chemical, feedings, and fertilizers via FPCs, particularly when a great number of small manufactures and their dispersed brokers compete in the rural village. However, the downstream buyers find the transaction costs are high and it is difficult for FPCs to organize collective marketing of output when the spatial coverage is within local villages.

Fifth, the cooperative Law enacted in 2007 has facilitated the development of FPCs in China. The newly initiated FPCs after 2007 are active in organizing collective marketing. Sixth, the FPCs initiated by farmers easily achieve collective action of centralizing the decision making of input purchasing. Furthermore, when FPCs are initiated by farmers exclusively, FPCs tend to centralize production and to allocate residual claim rights to member farmers. Lastly, the emergence of the new agribusiness mode introduces vertical coordination at farm gate via FPCs, but it does not affect the farmers' input use and production.

WILLIAMSON (1985) demonstrates that the difficulties of coordination of economic activities under conditions of uncertainty and risk lead to the adoption of indirect democratic decision-making within organizations, introducing hierarchical or centralized decision-making procedures. Members' commitment is most easily achieved in small and decentralized cooperatives. To achieve economic efficiency, however, many cooperatives become larger and centralize decision making. Information that can reduce uncertainty and the associated probability of errors in decision making is modeled as input, jointly determining the optimal organizational structure (FULTON and KING 1993).

The emergence of FPCs in China presents mixture of economic rationale, political will, and social dimension. The agrofood system in China is affected by the transformed agribusiness and relevant policies as well. Smallholder farmers may find it difficult to adapt themselves to the transformation. Participating in farmer

organizations may help them to get farming inputs and technology. The concentrated downstream segment of the agrofood chain also views farmer organizations as a viable institutional option to procure products and secure quality. As such, FPCs in China have a rich content of ‘subsidiaries’ and the governance structure is complicated. Farmers may find the full bundle rights of decision-making are undermined, and they have to devolve some rights out, particularly the marketing rights. However, as the core part, production rights will not be transferred as the family farming has been found the most efficient institutional arrangement in the agrarian economy (BINSWANGER, DEININGER and FEDER 1995).

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