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Governance, CEO Identity, and Quality Provision of Farmer Cooperatives

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To My Parents

Acknowledgement

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Chapter 1: Introduction

This chapter provides an overall introduction of the research, including the background of the research (1.1), a brief introduction to cooperatives in China (1.2), the research objectives and questions (1.3), and the outline of the thesis (1.4).

1.1 Background and problem statement

The agricultural supply chain in China is diversified and undergoing transformation in both structure and management. It includes not only the traditional production-supply-marketing system consisting of small farm households, peddlers, processing enterprises, wholesalers and retailers, but also new retailers such as comprehensive supermarkets and specialized fruit supermarkets. The rise of supermarkets and specialized distribution centers is a challenge to small farmers. They can hardly deal with the private standards of these modern transaction parties, nor do they have the countervailing power to gain reasonable value added shares. The characteristics of agricultural markets tend to cause market failure due to farmers' investments in sunk assets and buyer concentration in local markets (Sexton and Lavoie, 2001).

Farmers are searching for ways that may help them to face these challenges. Theoretically, an increase in farmers' production scale may alleviate the difficulty. However, a scale increase is not always feasible due to the special characteristics of agricultural production. It is costly and not easy to enlarge production scale by renting additional land. Neither is it always efficient to hire and supervise labour other than family members. Collective action via farmer cooperatives is often recognized as a possible response to market failure (LeVay, 1983; Hansmann, 1996; Valentinov, 2007). Cooperatives are expected to emerge to address these problems such as small scale production problems, powerful intermediaries or retailers, and missing markets.

Various governance structures are observed in agricultural markets, such as firms, contracts, cooperatives, franchises, networks, and so on. A governance structure is defined as the allocation of ownership rights, decision rights and income rights over relevant assets (Hansmann, 1996; Baker et al., 1999). A cooperative is a member-owned, member-controlled, and member-benefitted enterprise (Dunn, 1988). Returns are usually distributed according to patronage or use rather than equity (Shaffer, 1982). The three essential characteristics of cooperatives highlighted by Shaffer (1982) are service at cost to members, democratic control by members, and limited return on equity capital. Nevertheless, cooperatives in different countries vary in terms of their development and internal governance. Nowadays cooperatives in the West are transforming and restructuring from traditional cooperatives

to new cooperative modes, or investor-owned firms (IOFs). Cooperatives correspondingly need to adjust their internal governance mechanisms, their external strategies, and their management (Cook, 1994).

The genesis of farmer cooperatives depends on the environment and is influenced by various constrains, such as bargaining problems, information constrains, political constrains, and the local history and culture. The way organizations are founded has lasting effects on their structure and performance (Kuilman at al., 2009). Poor organization in the initial period is hard to effectively recover later (Hannan and Freeman, 1984). In China a farmer cooperative is defined as 'an economic organization, based on rural household contact management system, which is organized voluntarily and controlled democratically by farmers and which aims to provide and serve members with agricultural inputs purchase, product sale, processing, transport, storage, and other services related to technique and information' in the National Farmer Specialized Cooperative Law (briefly named as Cooperative Law or Law instead). Most farmer cooperatives in the West are the outcome of horizontal cooperation between farmers. It is a bottom-up process of collective action by farmers. Cooperatives in China follow an alternative pathway and choose an alternative model than cooperatives in the Western countries. The initiation of farmer cooperatives in China is due to the economic behavior of a group of entrepreneurs with the support of the government, rather than the collective action of small farmers. Most cooperatives in China have a member as CEO, whereas most cooperatives in Western countries have an outside CEO. However, empirical studies regarding the internal governance and management of farmer cooperatives in China are scarce. This research contributes to the understanding of Chinese farmer cooperatives in terms of governance and management.

The functions of cooperatives are addressed by many scholars (Clark, 1952; Staatz, 1987; Zusman and Rausser, 1994; Valentinov, 2007). As an organization of small farmers, farmer cooperatives can be regarded as an enterprise collectively owned by many independent farmers as input suppliers (Feng and Hendrikse, 2011). This makes it possible to combine the advantages of family based farms with the economies of scale in purchasing, marketing, and bargaining of the collectively owned cooperative enterprise. More important, farmers depend on cooperatives to improve market competitiveness by enhancing bargaining power, economies of scale in marketing, and technological improvements. Nowadays there are not only traditional supply chains characterized by spot markets, wet markets, and wholesalers, but also modern supply chains where there are cooperatives, specialized processing firms, and supermarkets (Huang and Liang, 2009). The co-existence of various governance structures raises a question regarding how farmers choose their product outlet between cooperatives and various alternatives. Farmers' outlet choice is not only influenced by various factors such as product characteristics, market structure, and governmental support, but also by farmers' age, education, and

so on (Guo and Jiang, 2004). As the economy develops, consumer preferences are becoming more diversified and have a higher demand for quality. Due to farmers being small in China, cooperatives have become the main adopters of food quality standards (Zhou and Jin, 2009). However, to date not much work has been done regarding the outlet choice of farmers with different product quality. This research examines how farmers with heterogeneous product quality choose their outlet(s).

1.2 Cooperatives in China

This section starts with the emergence and evolution of farmer cooperatives in China during the past 60 years (1.2.1). Next different models of farmer cooperatives in China are distinguished (1.2.2).

1.2.1 Emergence and evolution of farmer organizations in China

Farmer organizations in China have experienced ups and downs during the past 60 years. Three types are distinguished in their development: community cooperation, the people's commune, and the farmer cooperative. The development phases are depicted in figure 1.1.
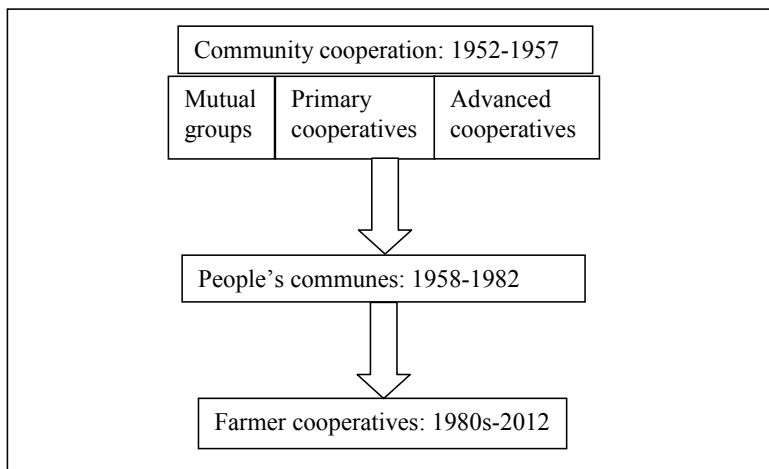
Figure 1.1 The development phases of farmer organizations in China

Community cooperation: 1952-1957

After the land reform in China in the 1950s, farmers began to have the usage right over land as well as the residual right over products. However, each farmer had a quite small size of arable land due to the large population of farmers. They were not able to meet the demand of industrialization. The government therefore launched a series of cooperative movements in order to help farmers improve their scale of production. Mutual groups, primary cooperatives, and advanced cooperatives were the three forms of cooperatives adopted. Mutual groups arose first. They were established based on

farmers' joining voluntarily and the reciprocity principle. Farmers had the ownership rights regarding their production land and tools. Farmers supported each other regarding production and harvest by sharing production tools. Subsequently, the primary cooperative came into being. It was characterized by collective production and benefit allocation based on land size. Finally, advanced cooperatives emerged. Farmers' land and tools were owned collectively by the cooperative and farmers were paid on the basis of their working time. At the end of 1956, 88% of farmers in China had joined advanced cooperatives (Sun, 2006).

People's commune: 1958-1982

Due to the governmental requirement, the advanced cooperatives began to be restructured into the people's communes in 1958. Almost all (99%) farmers joined the people's commune. A people's commune was characterized by collective and centralized ownership by the commune rather than by farmers. All members transferred their production land and tools to the commune. All farmers received the same wage.

The collectivity and egalitarianism weakened farmers' incentives to work and consequently hurt the efficiency and development of agriculture. Furthermore, market transactions were ruled out due to the planned purchase and marketing by the state. China paid a huge price for this orientation and institutional structure. Farmers became poor and weak. However, the failure at this stage triggered the development of a new type of cooperative.

Commune and brigade enterprises are another important organization. They emerged in the 1950s in the rural area. Commune and brigade enterprises were initiated at the lowest government level by village leaders. They were mainly involved in the processing of agricultural products (Huang, 2012).

Farmer cooperative: 1980s-2012

The most important issue in the late 1970s is the shift from the collective ownership system to the Household Responsibility System (HRS). The operation rights regarding agricultural land are distributed to farmer households, whereas the ownership rights stay with the State. Nowadays farmers can have 30 years of operation rights regarding agricultural land. The contract period can be extended after 30 years, or land may be redistributed within a local village, depending on the governments' planning. This reform in the rural area triggered institutional innovations. One is the flourishing of township and village enterprises (TVEs). They are restructured commune and brigade enterprises after the rural economic system reform in 1978 (Huang, 2012). TVEs are established by local government and are collectively owned by local residents (Bolton, 1995). They are generally in consumer goods industries, such as transportation, construction, food processing, paper making, and spinning, with the

initial aim of supporting and capitalizing local agricultural development. TVEs include enterprises located in rural areas that are either owned collectively by local residents or owned privately by individual(s). For privately owned TVEs, authority resides with the owners. For publicly or collectively owned TVEs, control rights are held by local governments. They hire managers to run the enterprises. The local governments hold the residual income rights of TVEs. Profits are used to finance local infrastructure projects, local education, etc, and a share of the profits is obtained by local governmental officials (Wang, 2010). Both managers and other workers of TVEs are paid wages. However, the incentives to produce and to develop new markets are limited. This caused the privatization of TVEs at the end of the 1990s. Many TVEs were sold to local entrepreneurs who may also be officials. This change in ownership rights contributes to the development of privately owned TVEs. Nowadays, TVEs are owned and managed by local entrepreneurs.

Due to the HRS, farmers began to have the usage rights over the land and the ownership rights over the yields of the land. However, it also means that farmers need to sell the products themselves. The problem of smallholders entering into large markets emerged. There are still worries about small farmers' ability to enter into the large markets and to obtain reasonable benefits. Farmers are faced with multiple challenges. Examples are a small marginal profit, industrialization, specialisation, informatisation and globalisation of other participants in the agricultural supply chain. Small farmers are incapable of negotiating effectively with other participants in the supply chain due to the scarcity of market information and their small production scales. They hardly benefit from the value added of products. Farmer cooperatives, different from the previous organizations, have developed to help farmers with this problem.

Farmer cooperatives emerged in the 1980s and developed slowly. They began to grow rapidly in the 2000s (Xu, 2005). As the promulgation of the National Farmer Cooperative Law (Law afterwards) in 2007, the development of farmer cooperatives was even faster. The government helps and subsidizes the development of agriculture because of its importance to the entire economic development. By the end of March, 2012, there were 525,300 farmer cooperatives with 43.0 million members in China.[1] More than 17% of the farmers have joined cooperatives. Four stages in the development of these farmer cooperatives in China are distinguished in table 1.1.

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[1] Data source: The Ministry of Agriculture of the People's Republic of China. Available at http://www.moa.gov.cn/

Table 1.1 Stages of development of farmer cooperatives in China during 1980s-2010

Period	Events	Characteristics
Early 1980s-Early 1990s	Emergence of Farmer Specialized Association	Government led; Service oriented; Civil Bureau Registration.
1990s	Transformation from Farmer Specialized Association to Farmer Specialized Cooperative	Civil Bureau registration or Industrial and Commercial Bureau Registration.
End of 1990s-2007	Take-off and consolidation of Farmer Specialized Cooperatives	More market orientation; Civil Bureau registration or Industrial and Commercial Bureau Registration; Government promotion.
2008-	The promulgation of National Cooperative Law	More market and profit orientation; Capital seeking; More value adding; Registered only with Industrial and Commercial Bureau.

Notes: Summarized by the author.

1.2.2 Models of farmer organizations

Farmer cooperatives in China are mainly referred to as farmer specialized cooperatives and farmer specialized associations. They differ from farmer specialized associations. A farmer specialized association is an organization established and operated by the government. It aims to standardize and promote the development of a specific product, and meanwhile provide farmer members with technical instruction, market information, intermediary services between farmers and buyers, and so on. It is an effective communication bridge between the government and farmers. However, agricultural associations can not take part in economic activities in the markets. Many associations in China have transformed to farmer specialized cooperatives in order to enter into the markets and to negotiate for farmers directly.

Rural credit cooperatives are financial institutions owned and controlled by rural residents engaged in agricultural production and sale. They aim to offer financial services for members. Its establishment must be authorized by the state bank of China. However, separated from the original aims of rural credit cooperatives, financial loans are not easily accessible for small farmers due to the high risk in agricultural production.

The focus is on farmer specialized cooperatives in this thesis. There are different types of farmer cooperatives in terms of the function of a cooperative. Marketing cooperatives are most frequent. Others are processing cooperatives, service cooperatives (input purchasing cooperatives, agricultural

machinery cooperatives), land shareholder cooperatives, and so on. In addition, Xu and Wu (2011) distinguish five basic types of farmer cooperatives in China:

1) Traditional or classical cooperatives account for approximately 10% of the total number. Traditional cooperatives in China are characterized by democratic decision making and equal distribution of profits.

2) Investment share cooperatives account for approximately 40% of the total. They are mainly located along the eastern coast. Most or all of the capital shares are being held by a few core members. This is the most distinctive characteristic of investment share cooperatives. Profits are allocated to members largely based on capital.

3) Modern cooperatives are similar to new generation cooperatives in North America (Xu and Wu, 2011). This type accounts for approximately 10% of the total. They are also located along the eastern coast. They are more market-oriented. Profits distribution is usually on the basis of both capital and delivery, where delivery payments are more important than in investment share cooperatives. These three types of cooperatives, traditional cooperatives, investment share cooperatives, and modern cooperatives, are registered at the Industrial and Bureau Department.

4) Association cooperatives are roughly 30% of the total cooperative number. Association cooperatives are generally founded by the governments, in order to help farmers with production technology, market information, product promotion, brand established, and so on. They may help farmers to establish contacts with downstream buyers, but not sell products for farmers.

5) Allied cooperatives or cooperative unions account for less than 5% of the total. A cooperative union is a horizontal cooperation between specialized cooperatives of the same or similar product. Members of a cooperative union therefore are cooperative firms, rather than individual farmers. It is established to share technological and market information, build brands, and promote products.

1.3 Research objectives and questions

This thesis addresses the genesis and governance of farmer cooperatives. Attention is given to both the internal governance of cooperatives in China and the external function of cooperatives. Specific research objectives are:

to provide an overview of farmer cooperatives in China, including the emergence, the development route, and their different modes;

to identify the actors in the genesis of Chinese farmer cooperatives;

to delineate the governance of cooperatives in China in terms of ownership rights, decision rights, and income rights;

to analyze the impact of CEO identity, a member CEO or an outside CEO, on the efficiency of cooperatives;

to analyze the impact of cooperatives' payment scheme on farmers' outlet choices and payoffs.

The following research questions are addressed to reach the research objectives:

Question 1: Who are the main actors in the genesis of farmer cooperatives in China?

Question 2: What are the governance characteristics of cooperatives in China in terms of ownership rights, decision rights, and income rights?

Question 3: What are the incentive differences between a cooperative with a member CEO and a cooperative with an outside CEO?

Question 4: How do heterogeneous farmers choose different governance structures? Do cooperatives serve as a competitive yardstick?

1.4 Outline of the thesis

The structure of the thesis is described in figure 1.2. In **Chapter 2** we start with a descriptive analysis regarding the genesis of farmer cooperatives in China. Data collected from 37 farmer cooperatives in Zhejiang province, China, is used. The characteristics and main actors in the genesis of farmer cooperatives in China are identified.

We address the governance structure of cooperatives in China in **Chapter 3**. One of the distinguishing features of Chinese cooperatives is the distinction between core and common members. The distribution of ownership rights, decision rights, and income rights within the membership is examined. The allocation of ownership rights is described in terms of assets and voting rights, decision rights in terms of both formal and informal control rights, and income rights in terms of the distribution of residual payments.

A principal-agent model is formulated in **Chapter 4** to address the efficiency of cooperatives with different CEO identities: member CEOs and outside CEOs. Management is important to the performance and efficiency of cooperatives. Cooperative management differs from the management of investor-owned firms due to the user-owner relationship. For example, the management of an IOF focuses on the objective to maximize the capital investment return for investors, whereas the management of a cooperative has to take into consideration members' interests which are more complex than those of owners of IOFs. Another aspect of the management between cooperatives and

IOFs is that managers in a cooperative may also be owners of the cooperative enterprise. A cooperative has therefore to choose as a manager either a member who has residual claim rights in the cooperative or an outsider who is purely employed without residual claim rights.

In **Chapter 5**, we examine the impact of cooperatives' pooling policy on the outlet choices of farmers, delivering to the cooperative or the IOF. Cooperatives and IOFs are the main governance structures in agricultural supply chains. They differ in policies regarding pricing and profit distribution. The co-existence of various governance structures raises the question why one governance structure is preferred to another. A non-cooperative game between farmers and enterprises is formulated. Given the heterogeneity among consumers, farmers are therefore assumed to be heterogeneous in product quality. The model not only examines how cooperatives' pooling policy influences farmers' product outlet choices but also addresses how the presence of cooperatives in agricultural markets affects farmers' surpluses.

We summarize the main findings in **Chapter 6**.
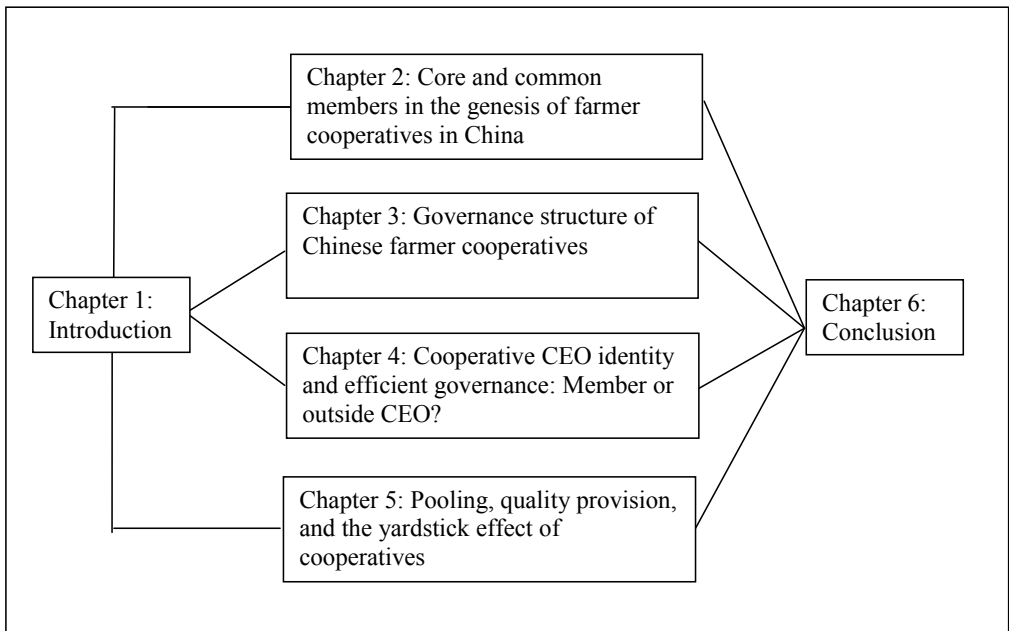
Figure 1.2 Structure of the thesis

Chapter 2: Core and Common Members in the Genesis of Farmer Cooperatives in China[2]

Abstract

This paper addresses the genesis of farmer cooperatives in China in terms of the actors. Empirical results from a multiple case study indicate that the genesis of cooperatives in China is due to entrepreneurial farmers and the government, rather than a bottom-up, collective action process of many small farmers.

2.1 Introduction

Most small farmers face small scale production problems, powerful intermediaries or retailers, and missing markets. It is therefore to be expected that solutions will emerge to address these problems. One of the solutions is a farmer cooperative. It is an enterprise established and collectively owned by many farmers in an adjacent stage of production. Its primary aim is to serve the interests of members, i.e. to realize economies of scale, to build countervailing power, to gain access, and to provide member services.

Farmer cooperatives emerged in the Western world at the end of the nineteenth century, while starting later in other parts of the world. Various stages of development in their evolution have been distinguished by Cook and Plunkett (2006): genesis, growth, emergence of internal conflicts, recognition and analysis, and options choice stages. The initiation of farmer cooperatives turns out to vary across countries. The member orientation of cooperatives makes it likely that members initiate the cooperative, but there are also many cases where other parties have been important in the genesis of cooperatives, like national or regional governments, or local entrepreneurs. This article addresses the genesis of cooperatives in China.

The earliest Chinese cooperatives were named People's Community Cooperation. In the 1950s they appeared under the planned economy and Marxist tradition. People's Community Cooperation were established by the central government and characterized by collective ownership, central planning, and state-embeddedness (Xu, 2005). People's Community Cooperation disappeared several years later. They were restructured into the People's Commune in 1958. Almost all (99%) farmers joined the People's Commune (Sun, 2006). Different from People's Community Cooperation, the People's

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Commune is characterized by collective and centralized ownership by the commune rather than farmers. All members transfer their production land and tools to the commune. Farmers have no ownership rights or residual income rights over the products. They were merely workers who were paid equally.

A new model of cooperatives, characterized by farmer ownership and market economic-orientation, began to be established in the 1980s after the implement of the Household Responsibility System (HRS). According to the HRS, agricultural lands are collectively owned by villages. Farmers have the operation rights including using and re-renting rights of lands and most importantly residual income rights of outputs. We refer to these new model cooperatives as farmer cooperatives (translated as "farmer specialized cooperatives" in Chinese). There were 26,400 farmer cooperatives at the end of 2006. Since the promulgation of the National Farmer Cooperative Law in 2007, the number of farmer cooperatives has increased very rapidly. By the end of March, 2012, there were 552,300 farmer cooperatives with 43.0 million members in China. Around 17.2% of Chinese farmers have joined cooperatives.[3]

There is a scarcity of data about the genesis of cooperatives in China. The contribution of this article is to address empirically the genesis of farmer cooperatives in China with the research question 'Who are the main actors in the genesis and early development of farmer cooperatives in China?'. Section 2.2 delineates the genesis stage of the life cycle of cooperatives. Section 2.3 presents the methodology. The data and descriptive analysis are presented in section 2.4. Section 2.5 discusses the results. We conclude in section 2.6.

2.2 Bottom-up versus top-down initiation

Three types of initiation regarding farmer cooperatives are distinguished in this section.

Bottom-up initiation

Various countries have experienced the bottom-up initiation of farmer cooperatives. A number of examples are presented. The German wine cooperative Moselland has its origins in the19th century. Small wine-growing cooperatives were formed regionally by many individual growers. Various mergers between regional cooperatives have resulted in the current large cooperative Moselland eG. In Germany timber merchant Hans Tenhaeff organized, together with several farmers, farmers into a fruit & plant growing association in 1910. Their aim was to develop a modern production and marketing system for agricultural and decorative plant products. A subsequent process of investments, mergers, and takeovers resulted in the current horticultural cooperative Landgard (Landgard, 2012).

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[3] Data source: The Ministry of Agriculture of the People's Republic of China. Available at http://www.moa.gov.cn/

Cooperatives have also been initiated by key persons in a village or province, or farmer organizations. Priest Van den Elsen has been instrumental in setting up many cooperatives in the south of the Netherlands (Internationaal Cooperatief Centrum, 2012). Most agricultural cooperatives in the Northern USA evolved through Farmers Union, a farm lobbying group created by small farmers. This nonpolitical, bottom up organization emerged as a response to market failure. Golovina and Nilsson (2009, p225 and 230) state more generally that '… cooperatives experiences historically and internationally …' show that they are '… grass root organizations'.

These examples do not imply that the bottom-up emergence of cooperatives goes fast, or emerges at all. It requires that somebody steps forward to initiate the farmer cooperative and that somebody becomes the leader of the cooperative. This requires not only various skills, but it is also time consuming to provide this collective good for the entire membership. Qualified persons may therefore not take the lead, despite the collective need to start a farmer cooperative.

Top-down, government

There are various cases in the world where cooperatives are initiated top-down by the government. We provide examples from the United States, Spain, and Russia. Olson (1965) describes that in the early 1900s the Farm Bureau was crucial for the formation of cooperatives in the states Illinois and Indiana in the USA. The Farm Bureau was created by the government and benefited farmers through provision of technical aid and education.

The Franco regime in Spain introduced the Law of Cooperatives in 1942, which set up and organized agricultural cooperatives in Spain so as to be compatible with its government and social strategy. Thereafter, legislation was set up for rural credit cooperatives and also agricultural cooperatives, where the rural credit cooperatives initially loaned only to agricultural entities.[4] The cooperative legislation was clearly 'top down' and resulted in setting up cooperatives. The case of Spain illustrates that farmer cooperatives are frequently considered as instruments for governments to structure society.[5] However, the eventual success of the agricultural cooperatives was 'bottom up' initiatives carried out by a rejuvenated cooperative sector in the 1980s. Investment in technology is a key feature, as is the dissemination of such technical knowledge.

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[4] Giagnocavo (2010) addresses the resulting co-evolution of agricultural and rural credit cooperatives in the Spanish province Almería. Statistics regarding the number of 'top down' cooperatives formed and the percentage of the cooperative market share in various sectors are presented by Cervantes and Fernandes (2008). Núñez-Nickel and Moyano-Fuentes (2004) show that Andalusian cooperatives in the olive oil and milling industry have an advantage over their commercial rivals and are robust to a regime being hostile to the democratic tradition in cooperatives.

[5] Greece is another example of a country where cooperatives are considered as an instrument for political parties (Iliopoulos and Valentinov, 2012).

A top-down initiation of farmer cooperatives by the government occurred also in Russia. Post 1990 farmer cooperatives are organized, financed and managed by governmental bodies. Farmers are then invited to become members of the cooperatives without investing any money. Farmers do not have any capital share in the cooperatives (Golovina and Nilsson, 2009). This type of cooperative is usually characterized by unallocated equity, collective decision-making, and equal treatment, which impedes a profitable functioning of cooperatives. These cooperatives are therefore more legislation oriented and service-oriented. Gardner and Lerman (2006) argue that this is more likely to happen in the economic environment of transition economies. However, the prospect of such cooperatives is limited due to farmers' low trust and low level of dependence on these cooperatives (Golovina and Nilsson, 2009).[6]

Top-down, entrepreneurs

Farmer cooperatives may also be initiated by entrepreneurs, including entrepreneurial farmers, entrepreneurial officials who used to work in governmental departments related to agriculture, and entrepreneurial businessmen engaged in agri-products (Huang and Xu, 2006). This type of cooperative is commonly seen in China. Entrepreneurs who initiate the cooperative are members of the cooperative and generally hold the essential and scarce production factors, such as knowledge regarding production technologies, asset capital, marketing capabilities, social networks, and so on (Lin and Huang, 2007).

2.3 Methodology

To develop a better understanding of how cooperatives are organized in China, we employ a rigorous descriptive micro analytic approach. A multiple-case study is developed to describe and analyze the start-up of farmer cooperatives in the Zhejiang province, China. The sample consists of 37 farmer cooperatives. Data is collected from documents and first-hand interviews. Firstly, documents such as statutes and by-laws of cooperatives were collected. Secondly, face-to-face individual interviews with chairpersons or managers were conducted in order to collect primary data. Face-to-face individual interviews with cooperative members were carried out during March 2011 and June, 2011. The chairperson or a manager of each cooperative in the survey was interviewed. The questionnaire is provided in Appendix 1.

It is important to recognize that cooperatives in different parts of China vary in their stage of development. Cooperatives firstly came into being in eastern China where the economy and market levels are more developed and agriculture is more industrialized. Cooperatives in western China are

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[6] Carroll et al. (1988) present evidence that the organizational structure and the behavior of agricultural cooperatives are strongly affected by the structure of the Hungarian state, where Hungary had a communist system with one party and various decentralized economic forms.

still in the start-up phase. Within the population of farmer cooperatives in China, we surveyed a sample of cooperatives in Zhejiang province. Zhejiang is located in the southeast of China (see Figure 2.1) and is one of the most developed provinces in China. The GDP per capita of Zhejiang province was $7690, ranking first among the provinces in China, while the GDP per capita of China was $4382 in 2010.[7] However, the average arable land area per capita is smaller than 0.4 mu (1 hectare = 15 mu) in Zhejiang, while the national average plantation land area per capita is 1.38mu in 2010.[8] Due to its scarcity of land and its relatively developed economy, Zhejiang specializes in high value products, such as fruits and vegetables. We focus on fruit and vegetable cooperatives during the field investigation in order to ensure relative homogeneity of cooperative enterprises.

Figure 2.1 Map of China

Zhejiang province was chosen as the survey area for two main reasons. The first reason is that Zhejiang is leading the way in farmer cooperative development in China, in terms of both quantity and performance. There were 3916 farmer cooperatives with a total membership of 270,000 in Zhejiang in 2006.[9] At the end of 2010, there were 20,678 farmer cooperatives with a membership size of 768,000.[10] Among these cooperatives, more than 70% of them are row crop or field cooperatives, while the other 30% are livestock cooperatives. Fruit and vegetable cooperatives are the two most common types of

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[7] Data source: China Statistical Yearbook 2011.
[8] Data source: Ministry of Land and Resources of the People's Republic of China. Available at http://www.mlr.gov.cn/
[9]   Data   source: Agricultural   Department   of   Zhejiang   Province.   Available   at http://www.zjagri.gov.cn/html/main/gb2312/index.html
[10] Data source: Zhao et al. (2011).

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field cooperatives. Fruit cooperatives account for around 40% of crop cooperatives, while vegetable cooperatives account for around 30%. The number of cooperatives has been increasing rapidly and farmer cooperatives are playing an increasing role in agriculture markets in Zhejiang.

Secondly, Zhejiang put into practice the Zhejiang Farmer Cooperative Law at the beginning of 2005. It is the first provincial and official cooperative law in China. The National Farmer Cooperative Law in China was promulgated on July 1st, 2007, which was based on the Zhejiang Cooperative Law. It implies that cooperatives in Zhejiang are considered to be leaders in cooperative organizational design.

Random sampling is used. We chose 50 farmer cooperatives randomly from the documented list of cooperatives provided by Zhejiang Agricultural Department, all of which are vegetable and fruit marketing cooperatives. These 50 farmer cooperatives are distributed over different cities of the Zhejiang province. We failed to interview members of 5 cooperatives that we initially chose, due to unavailability of interviewees. Therefore we interviewed members from 45 farmer cooperatives. A questionnaire was counted as valid when there were no significant inconsistencies between the information collected from members of a cooperative and no important information was missing. An example of an inconsistency of information is a substantial difference between a chairperson's capital share reported by the chairman and the chairperson's capital share reported by others. One reason may be that a chairperson may try to hide the truth about his capital shares by offering wrong information when he owned shares beyond the ceiling of shares required by the Law. We discarded this questionnaire when we were not able to find out the verifiable information. Among all the cooperatives visited, data from 8 of them were discarded due to missing information or informational inconsistencies. We have therefore 37 cases.

2.4 Descriptive statistics

The data is provided in Appendix 2, while the descriptive statistics are presented in the Tables 1 to 4. Table 2.1 shows that all the cooperatives in the survey were founded between 2001 and 2006. Products of these cooperatives were in fruits and vegetables. Most cooperatives (83.7%) had their production bases within a local city.

Table 2.1 Genesis, main product, and geographical scope of 37 Zhejiang fruit-vegetable cooperatives (2011)

		Number of cooperatives	Proportion (%)
Total number of cooperatives		37	100
Genesis	2001	1	2.7
	2002	10	27.0
	2003	11	29.7
	2004	6	16.2
	2005	7	18.9
	2006	2	5.4
Main products of cooperatives	Fruits	28	75.7
	Vegetables	7	18.9
	Vegetables & fruits	2	5.4
Geographical scope of production bases	Within a local village	4	10.8
	Within a local town	15	40.5
	Within a local city	12	32.4
	Within a local province	1	2.7
	Nationwide	4	10.8
	International	1	2.7

Table 2.2 presents the membership size and members' geographical distribution of the farmer cooperatives. Two thirds of the cooperatives had membership sizes between 100 and 200. Three fourths of all cooperatives had their membership within a local town, while only one of the 37 cooperatives had a beyond city membership.

Table 2.2 Membership size and location of 37 Zhejiang fruit-vegetable cooperatives (2011)

		Number of cooperatives	Proportion (%)
Total number of cooperatives		37	100
Membership size	<100	7	17.9
	[100-200)	25	67.6
	[200-500)	3	8.1
	≥500	2	5.4
Geographical scope of the membership[11]	Within a local village	8	21.6
	Within a local town	20	54.1
	Within a local city	8	21.6
	Within a local province	0	0
	Nationwide	1	2.7

All the cooperatives in the survey had a merged body of the management and the board. Members of the management and the board are referred to as core members, due to their key roles in the farmer

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[11] The location of the membership is different from the location of production base because some farmers rent additional lands from farmers within or beyond their own village.

cooperative. There are both male and female core members. A core member may either have individual farming or have discarded farming. This latter type of core members focuses on the management and value-adding business of cooperatives. A core member holds relatively large shares and is in charge of at least one of the key businesses areas (management, input purchasing, production, product purchasing, marketing, accounting, and so on). Other members are referred to as common members. The number of core members is presented in Table 2.3. There were on average 6 core members in the cooperatives in the survey, accounting for 3.5% of the membership. In addition, table 3 shows that there are usually three, five, or seven core members, which implies that numbers of core members tend to be an odd number. The cooperative with 40 core members is a nationwide cooperative having multiple production bases all over China and also one production base in Vietnam. In each of the production base, there were a few core members, which contributed to the large number of core members.

Table 2.3 Number of core members in 37 Zhejiang fruit-vegetable cooperatives (2011)

No. of core members	2	3	4	5	6	7	8	9	40
No. of Coops	1	11	3	13	1	4	2	1	1

To become a core member in a cooperative, at least one of the following conditions needs to be met. Firstly, a core member is usually one of the initiators of the cooperative. Exceptions are possible. A member joining the cooperative after its founding may also become a core member due to distinct capabilities. This happened in only one farmer cooperative we surveyed. Secondly, a core member is generally good at management, marketing, and/or has an important network with downstream buyers and processors. Examples are a chairperson who used to be the village head is good at organizing farmers; a chairperson who used to do transportation and sales has many skills in marketing and is able to establish a broad marketing portfolio of products; and a chairperson who used to run a company tends to guide the cooperative into the direction of demutualization. Farmers with greater asset capital, human capital, and social capital have a higher probability to obtain authority, economic benefits, or political benefits. In addition, the education level may also influence human resources. The education level of chairpersons was significantly higher than the average education level of farmers in China. Table 2.4 shows that 75.7% of chairpersons had middle-school education and 21.6% had high school education, while the average proportion of farmers in China having high school education was 48.1% and having senior high school education was 11.6%.[12]

In addition, two fifths (40.6%) of the cooperative chairpersons were or used to be a village head or

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[12] National Bureau of Statistics of China. Available at http://www.stats.gov.cn/

worked in a governmental department; 29.7% of them used to do product transportation and sales; 16.2% of them managed a company before initiating cooperatives; and finally 13.5% of the chairpersons were large farmers.[13]

Table 2.4 Education levels and working experiences of chairpersons of 37 Zhejiang fruit-vegetable cooperatives (2011)

		Number of cooperatives	Proportion (%)
Total number of cooperatives		37	100
Education levels of chairpersons	Below primary school	1	2.7
	Primary school	8	21.6
	High school	20	54.1
	Senior high school	7	18.9
	College and university	1	2.7
Working experiences of chairpersons	Used to be a village head or worked in a governmental department	15	40.6%
	Did product transportation and sale	11	29.7%
	Ran a company	6	16.2%
	Was a large farmer	5	13.5%

2.5 Discussion

This section addresses the membership size and locality of farmer cooperatives in China (2.5.1) and the actors involved in the genesis of these cooperatives (2.5.2).

2.5.1 Membership size and locality

The two distinctive features regarding farmer cooperatives in China are the small membership size and locality. There are at least four reasons. Firstly, local farmers have similar nature conditions such as climate and land. The nature conditions basically determine the specialization of a town or city in terms of industries and varieties of products. It is therefore much easier for local farmers to act collectively due to their similar products as well as similar production technologies.

The second reason is that farmers from the same town or city have the same cultural and economic backgrounds, which implies that they are exposed to similar situations in information collection and market access experiences with large markets. These common experiences make cooperation easier.

Thirdly, farmers from the same village or town usually know each other well. Farmers from the same village or town usually have a high degree of kinship (Huang and Xu, 2006).The mutual trust between members facilitates farmers' cooperation and meanwhile can save on governance cost of the cooperative. Additionally, the same dialect within some area contributes substantially to smooth

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[13] A large farmer is defined as a farmer whose production area is much larger than the average production area in the local village and who needs to hire full-time workers in production.

communication. As a result, the costs of decision making and coordination would be relatively low if there is mutual trust and members speak the same dialect.

Last but not least, the dominant position of the core members in the management of farmer cooperatives matters to a large extent. The management of Chinese cooperatives is seldom professional. All CEOs and the chairpersons in the cooperatives in the survey were members. Member managers may lack detailed knowledge of markets and management, compared with full-time professional managers (Sexton and Iskow, 1988). So they have to limit the membership size and also limit the membership within a certain area to ensure the homogeneity of interests of the members.

2.5.2 Actors

This section addresses the importance of core members, common members, and the government in the genesis of farmer cooperatives in China.

Core members

Farmers in China differ in asset capital, human resources, and social resources. In China some farmers have substantial capital, marketing capabilities, and/or social or professional networks. They are often entrepreneurial and are referred to as "elite" farmers. Examples include persons who used to manage private enterprises, those who used to work in the agricultural department, or persons having information about the product supply chain. Meanwhile, there are also common farmers, good at farming, but not experienced at marketing or management. Most farmers in China belong to this latter category. These differences determine different production and marketing strategies as well as different objectives between alternative groups of farmers. Farmers with high capabilities seek to realize entrepreneurship rents in terms of capital investment and authority through the management of cooperatives, whereas common farmers are satisfied by selling their products at reasonable prices. These entrepreneurial farmers organize common farmers into farmer cooperatives. A vital feature of cooperatives in China is therefore that they attract key production factors (Xu, 2005). A core member generally holds relatively more shares of the cooperative and correspondingly has more income rights, whereas a common member is expected to patronize the cooperative but is seldom involved in the operational decision-making. Though it is essential that common members produce and provide products that meet the demand of consumers, yet more important is that core members use their capabilities to enhance the value of cooperative enterprises by downstream value adding activities and acquiring higher profit in markets.

The background of a chairperson generates benefits for the farmer cooperative. The experience of working in governmental departments improves the chairperson's social capital and sequentially

enhances his capabilities in acquiring information, while the experience of doing product transportation and sales, managing company, and being a large farmer implies that the chairperson has more opportunity to access markets, which enhances the chairperson's capabilities in information collection and marketing.

Common members

Common members are farmers who buy a small amount of capital shares or pay an entry fee to join a cooperative. They transact with the cooperative, but are seldom involved in the management or operation of the cooperative. Common members therefore can be regarded as participants in the cooperatives. They participate in cooperatives mainly to pool risks and to obtain services provided by cooperatives such as input supply and marketing services (Sun, 2006). Hence, different from the core members' profit-seeking objective, common members are usually risk adverse and are satisfied by procuring services and stable prices.

Farmers obtain cooperative membership by buying capital shares. According to our investigation, in most cooperatives a farmer needed to buy at least one share of capital. However, in a small proportion of cooperatives, one share is bought by more than one member when they lack money.[14] One share of capital can range from 500 Chinese Yuan (77USD) to 2000 Chinese Yuan (308USD).[15] Hence, common members make small contributions to the finance of cooperatives.

In addition, common members usually do not participate in decision-making. In 34 (92%) of the cooperatives surveyed out of 37, decisions were made only by core members without the participation of common members, while common members participated yet core members still dominated in decision-making in the other 8% cooperatives. Therefore common members participate marginally in decision-making.

Government

The genesis and development of Chinese farmer cooperatives are not only due to the desire of entrepreneurial farmers, but is also driven and influenced to a large extent by the government. There are various aspects of the relationship between the government and cooperatives. Firstly, initiation of farmer cooperatives is to a large extent promoted by the government. The start-up stage of cooperatives in China began in the 1980s and entered into a period of rapid development in the 2000s. This development was reinforced in 2007 as the National Cooperative Law was promulgated.

Secondly, the government supports cooperatives in various ways, particularly with tax relief and

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[14] We do not have the data regarding the proportion of cooperatives in which a member was required to have at least one share of capital and that of cooperatives in which more than one member can together have one share.
[15] Based on the exchange rate at the time of the survey, 1 Chinese Yuan equals to 0.154 USD.

subsidies. Normally, subsidies are these for infrastructure of villages, and investment in storage and processing equipment. Subsidies are important to cooperatives at the start-up stage due to cooperatives' inability to raise sufficient capital. In addition, the government supports cooperatives by providing them production technique training and product promotions, and establishes competitions with rewards for brand establishment. No matter how important the role government plays, the initiation of farmer cooperatives in China is essentially due to market forces as well as farmers' desire for investment. The government accelerates or normalizes the development of cooperatives.

Thirdly, cooperatives do not only receive support from the government, but also the government uses cooperatives to realize some economic and political objectives. From the perspective of its economic function, the development of cooperatives can increase farmers' incomes and promote the local economy, industrialization, and the agricultural supply chain (Xu, 2005). Cooperatives organize small farmers to realize production standardization and product brand establishment, which are difficult for individual farmers. From the view of its political function, cooperatives naturally have an anti-poverty function (Xu, 2005; Wu and Xu, 2009). The government both collects information and voice from farmers and implements various policies via cooperatives. The voice of small farmers is organized and receives more attention due to the existence of cooperatives. Farmer cooperatives help the government also to carry out policies more efficiently and effectively. Therefore the government takes advantage of cooperatives to carry out governmental activities such as technical extension, development of industrialization, subsidizing poor farmers, and so on.

2.6 Conclusion and further research

The number of farmer cooperatives in China has grown very rapidly since the promulgation of the national Cooperative Law in 2007. The genesis of cooperatives in China is dominated by entrepreneurial farmers' economic ambitions and the government's economic and political objectives, rather than the small farmers, if the evidence in this study can be generalized.

There are many possibilities for further research. We formulate two possibilities. Firstly, one of the concerns regarding the development of farmer cooperatives in China is that they do not emerge bottom-up. Core members may be crucial for the genesis of farmer cooperatives in China, but farmer cooperatives will not survive if they do not serve the entire membership. The specifics of the genesis process of farmer cooperatives in China may have an impact on their subsequent development. For example, the dominance of a small percentage of the membership, i.e. the core members, may have an effect on the involvement of all members in farmer cooperatives in the subsequent stages of the life cycle of farmer cooperatives in China. Additionally, various farmer cooperatives in China have features similar to some farmer cooperatives in the Western world, like differentiation between

members in terms of quality premiums and voting rights and a focus on one product. This is allowed by the Cooperative Law.

Secondly, the genesis of farmer cooperatives in China is a top-down process dominated by the government and entrepreneurs, rather than the common members. This seems to reflect the development of China during the last decade. China is on the one hand a country with one party and a large government, but on the other hand provincial governments seem to have considerable impact on local economic developments. It will be interesting to see whether there is an imprint of the specifics of the country (Stinchcombe, 1965) on the subsequent development of farmer cooperatives, or that the interaction between the legal system and the economic incentives facing members in a farmer cooperative dominates (Williamson, 1996).

Chapter 3: Governance Structure of Chinese Farmer Cooperatives: Evidence from Zhejiang Province

Abstract

This paper addresses the distinction between core members and common members in farmer cooperatives in China in terms of the allocation of ownership rights, decision rights, and income rights. Empirical results from a multiple case study in the Zhejiang province (China) indicate that the distribution of ownership rights, decision rights, and income rights is quite skewed towards core members.

3.1 Introduction

Farmer cooperatives in the Western world have gone through various stages of development during their evolution, such as genesis, growth, emergence of internal conflicts, recognition and analysis, and options choice (Cook and Plunkett, 2006). Most farmer cooperatives in China are still in the genesis stage, but the growth in the number of cooperatives indicates a revolution in the governance of agriculture in China. The number of farmer cooperatives was 26,400 when the Cooperative Law[16] was promulgated in 2007. Subsequently, the number of cooperatives increased to 110,900 in 2008 and to 246,400, 379,100 and 521,700 in 2009, 2010 and 2011 respectively. By the end of March 2012, there were 552,300 farmer cooperatives[17] with 43.0 million members in China. Around 17.2% of the farmers have joined cooperatives.[18]

A governance structure delineates ownership rights, decision rights, and income rights regarding (physical or financial) assets (Baker et al., 2008; Hansmann, 1996). Ownership rights specify the formal rights regarding the residual control of assets, such as the property rights regarding the assets and the distribution of voting rights among the membership. Decision rights address the question 'Who has control (regarding the use of assets)?' and specify who directs the firm's activities, i.e. the allocation of real authority. Finally, income rights address the question 'How are benefits and costs allocated?', thereby creating the incentive system faced by the members and the decision makers. These three rights are reflected in the classic characterization of a farmer cooperative by Dunn (1988,

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[16] The full name is Farmer Specialized Cooperative Law of the People's Republic of China. We refer to it as Cooperative Law or Chinese Cooperative Law in this paper.
[17] According to an estimate, more than one third of cooperatives in China exist on "paper", around one third develop beyond the cooperative principles, and the last one third are functioning properly (Sultan and Wolz, 2012).
[18] Data source: The Ministry of Agriculture of the People's Republic of China. Available at http://www.moa.gov.cn/

p85) as user-owned, user-controlled, and user-benefitted, i.e. 'A cooperative belongs to the people who use its services, the control of which rests with all the members, and the gains of which are distributed to the members in proportion to the use they made of its services'.

A cooperative is characterized by member dominance, which is reflected in democratic control being one of the distinguishing features of farmer cooperatives. Decision-making based on democracy reflects the vesting control of the membership. "One member, one vote" is the classic principle of democratic decision-making, which is reflected in the second cooperative principle of the International Cooperative Alliance. However, the allocation of voting rights between the members differs between countries. Some countries prescribe to the principle of "one member, one vote" by law, but there are also countries where this is not specified in the law and a "one member, multiple votes" scheme has been adopted. Most of the cooperatives in the U.S. have a "one member, one vote" rule, while cooperatives in various countries in Europe adopt a proportional voting rule. China does not specify the principle of "one member, one vote" in its Cooperative Law. The Chinese Cooperative Law specifies that cooperatives are collectively owned and democratically controlled by members. Members present in the general assembly meeting should account for more than two thirds of the membership. The maximum share of votes during decision-making in the general assembly meeting is 20% for a single member. In addition, at least 60% of residual profits should be allocated on the basis of delivery.

Control in terms of decision rights and income rights in farmer cooperatives in China seems to mostly lie with a small group of members, called core members, while the other members, called common members, are hardly involved (Xu, 2005). The core members, rather than the whole membership, seem to be in charge of the cooperative (Huang and Xu, 2008). However, there is hardly any data supporting these claims about the governance structure (in terms of ownership rights, decision rights, and income rights) of farmer cooperatives in China. This paper presents data regarding these aspects of farmer cooperatives to characterize the governance structure. To be specific, we focus on the following research question: what are the governance characteristics of Chinese farmer cooperatives in terms of ownership rights, decision rights, and income rights? Topics highlighted are the distribution of votes among members, the way in which decision rights are allocated, the duties and responsibilities of the boards, the composition of the management, the decision rules, the equity capital structure, and the residual payment schemes in farmer cooperatives in the Chinese province Zhejiang.

This study has various contributions. Firstly, it provides a detailed description of enterprise characteristics and governance features of farmer cooperatives in one of the most developed provinces

in China (Zhejiang). Secondly, we distinguish core and common members in farmer cooperatives in China and relate this distinction to the governance structure features. Thirdly, we address the differences between Chinese farmer cooperatives and cooperatives in the Western countries. Fourth, the benefits and possible problems pertained to the governance features of Chinese farmer cooperatives are discussed.

The paper is organized as follows. The next section presents the methodology. The data and descriptive analysis are presented in section 3.3. Section 3.4 discusses the results. We conclude in section 3.5.

3.2 Methodology

A multiple case study is developed to describe and analyze the governance structure of farmer cooperatives in the Zhejiang province, China. Data is collected from documents and first-hand interviews. Firstly, documents such as statutes and bylaws of cooperatives were collected. Secondly, face-to-face individual interviews with chairpersons or managers were conducted in order to collect primary data. Face-to-face individual interviews with cooperative members were carried out during March 2011 and June 2011. The chairperson or a manager of each cooperative in the survey was interviewed. The questionnaire is provided in Appendix 1.

It is important to recognize that cooperatives in different parts of China vary in their stage of development. Cooperatives firstly came into being in eastern China where the economy and market levels are more developed and agriculture is more industrialized. Cooperatives in western China are still in the start-up phase. The government is promoting the foundation of cooperatives and many cooperatives are still growing fast. Within the population of farmer cooperatives in China, we surveyed a sample of cooperatives in the Zhejiang province. Zhejiang is located in the southeast of China (see Figure 3.1) and is one of the most developed provinces in China. The GDP per capita of the Zhejiang province was $7690, ranked first among the provinces in China, while the GDP per capita of China was $4382 in 2010.[19] However, the average plantation land area per capita is smaller than 0.4 mu (1 hectare = 15 mu) in Zhejiang, while the national average plantation land area per capita is 1.38 mu in 2010.[20] Due to its scarcity of land and its relatively developed economy, Zhejiang specialises in high value-added products, such as fruit and vegetables. We focus on fruit and vegetable cooperatives during the field investigation, in order to ensure relative homogeneity of cooperative enterprises.

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[19] Data source: China Statistical Yearbook 2011.
[20] Data source: Ministry of Land and Resources of the People's Republic of China. Available at http://www.mlr.gov.cn/

Figure 3.1 Map of China

Zhejiang province was chosen as the survey area for two main reasons. The first reason is that Zhejiang is leading the way in farmer cooperative development in China, in terms of both quantity and performance. There were 3916 farmer cooperatives with a total membership of 270,000 in Zhejiang in 2006.[21] At the end of 2010, there were 20,678 farmer cooperatives with a membership size of 768,000.[22] Of these cooperatives, more than 70% of them are planting cooperatives, while the other 30% are breeding and raising cooperatives. Fruit and vegetable cooperatives are the two most common types of planting cooperatives. Fruit cooperatives account for around 40% of planting cooperatives, while vegetable cooperatives account for around 30%. The number of cooperatives has been increasing fast and farmer cooperatives are playing an increasing role in agricultural markets in Zhejiang, and elsewhere in China.

Secondly, Zhejiang put into practice the Zhejiang Farmer Cooperative Law at the beginning of 2005. It is the first provincial and official cooperative law in China. The National Farmer Cooperative Law in China was promulgated on 1 July 2007, which was based on the Zhejiang Cooperative Law. It implies that cooperatives in Zhejiang are leading for advanced modes of farmer cooperatives in China to a large extent.

We chose 50 farmer cooperatives randomly from the documented name list of provincial pilot

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cooperatives[23], which was provided by the Zhejiang Agricultural Department. All of the cooperatives chosen are vegetable and fruit cooperatives. These 50 farmer cooperatives are distributed over different cities of the Zhejiang province. We were not able to interview members of five cooperatives that we initially chose, due to unavailability of interviewees. Therefore we interviewed members from 45 farmer cooperatives. A questionnaire was counted as valid when there were no significant inconsistencies between the information collected from members of a cooperative and no important information was missing. An example of an inconsistency of information is a substantial difference between a chairperson's capital share reported by the chairperson and that reported by others. One reason may be that a chairperson may try to hide the truth about his capital share by offering wrong information when he owned a share beyond the share ceiling required by the Law. We discarded this questionnaire when we were not able to find out the true information. Among all the cooperatives visited, data from eight of them were discarded due to missing information or informational inconsistencies. We have therefore a data base consisting of 37 cases.

3.3 Data

The data regarding the cooperatives in the survey is reported in appendix 3. Data is coded by grouping, averaging, and summing and is presented by descriptive analysis. We start by presenting the descriptive statistics of the farmer cooperatives and their chairpersons in the survey (3.3.1). The governance structure choices are presented in terms of ownership rights (3.3.2), decision rights (3.3.3), and income rights (3.3.4).

3.3.1 Cooperatives and their chairpersons

All the cooperatives in the survey are fruit and/or vegetable cooperatives founded between 2001 and 2006. The average membership size of the cooperatives is 171. The total sales value of cooperatives is 3,240,000 dollars[24] on average.

There are on average six core members in the cooperatives in the survey, accounting for 3.5% of the membership. Almost all cooperatives have three, five, or seven core members (Liang and Hendrikse, 2013). Working experiences and education levels of chairpersons are investigated due to the fact that Lin and Huang (2008) regard them as the two important factors influencing capabilities. According to the data presented in table 3.1, 75.7% of chairpersons have high school education and 21.6% have senior high school education, while the average proportion of farmers in China having high school

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[23] Pilot cooperatives are a subset of the cooperatives functioning properly (footnote 3). There are three levels of pilot cooperatives in China, i.e. the state level, the provincial level, and the city/county level. The others are ordinary cooperatives. The grading of cooperatives is done by the Agricultural Departments of corresponding levels based on a list of standards. Pilot cooperatives have the priority to receive subsidies as well as technical guidance from the government.
[24] The total sale value was 21,039,000 Chinese Yuan on average. Based on the exchange rate at the time of the survey, 1 Chinese Yuan equals to 0.154 dollar.

education is 48.1% and having senior high school education is 11.6%.[25]

In addition, two fifths (40.6%) of the cooperative chairpersons are or used to be a village head or worked in a governmental department; 29.7% of them used to do product transportation and sales; 16.2% of them used to manage a company before initiating a cooperative; and finally 13.5% of the chairpersons are or used to be a large farmer.[26]

Table 3.1 Education levels and working experiences of chairpersons

		Number of cooperatives	Proportion (%)
Total number of cooperatives		37	100
Education levels of chairpersons	Below primary school	1	2.7
	Primary school	8	21.6
	High school	20	54.1
	Senior high school	7	18.9
	College and university	1	2.7
Working experiences of chairpersons[27]	was a village head or worked in a governmental department	15	40.6%
	Did product transportation and sale	11	29.7%
	Ran a company	6	16.2%
	Was a large farmer	5	13.5%

3.3.2 Ownership rights

Members of cooperatives always have the formal right to be engaged in the decision-making process, in terms of voting, voice, and exit. According to the Law, boards of directors and supervisors make decisions by the "one member, one vote" rule, while for general assembly meetings, both the "one member, one vote" and the proportional voting rule are allowed by the Law. Of these 37 cooperatives in the survey, 23 (62.2%) of them have the "one member, one vote" rule, while 14 (37.8%) of them have the proportional voting rule, according to the bylaws of the cooperatives.

Empirically, there are usually two decision-making procedures. One is that core members proposed some decision options and all the members voted in favor of or against these decision options. A decision is approved when there are 50% or sometimes 70% of members in favor of it, depending on the rules of the cooperative. The other possibility is that decisions are made by core members without common members. Answers to question C-5 in the questionnaire (Appendix 1) show that 34 (92%) of the cooperatives surveyed use the latter decision procedure.

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[25] National Bureau of Statistics of China. Available at http://www.stats.gov.cn/
[26] A large farmer is defined as a farmer whose production area is much larger than the average production area in the local village and who needs to hire full-time workers in production.
[27] Sultan and Wolz (2012) classify them as bureaucratic entrepreneurs, agricultural entrepreneurs, business entrepreneurs, and farmers, which is consistent with our classification.

Figure 3.2 presents the formal and the real voting rules of the 37 cooperatives. Of the 23 cooperatives with the "one member, one vote" as the formal rule, decisions in 21 of them actually are made by only core members, while in two of the cooperatives decisions are made generally by the membership. Furthermore, though the "one member, one vote" is specified in the bylaws of the two cooperatives, only one of them applies the "one member, one vote" rule, whereas the other uses the proportional voting rule. Of the 14 cooperatives with the proportional voting rule, 13 of them are characterized by decisions being made by core members, while only one of them follows the bylaws that decisions are made by proportional voting of the membership.
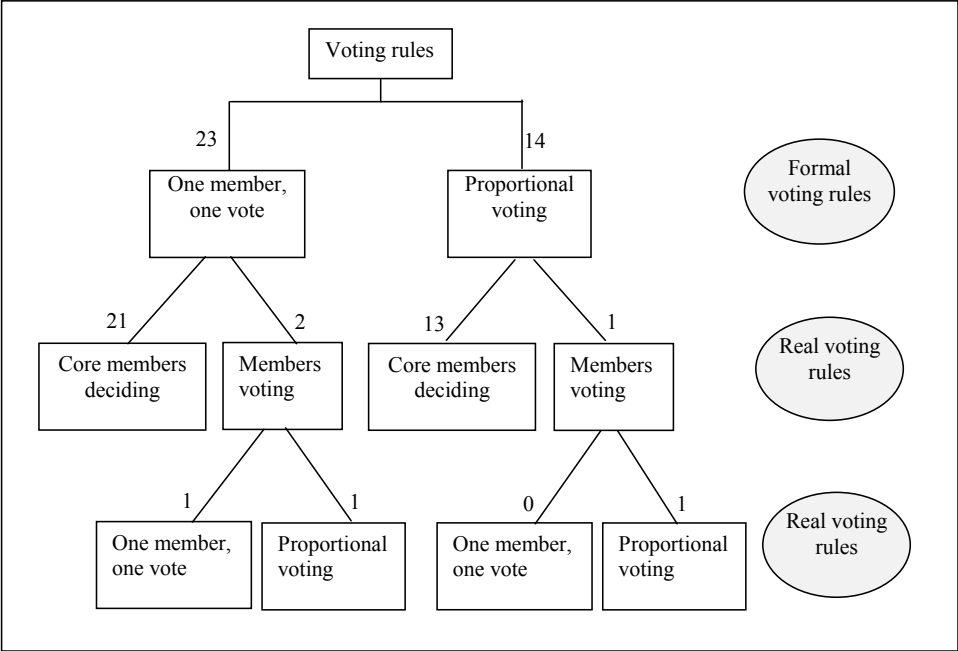
Figure 3.2 Formal and real voting rules

3.3.3 Decision rights

According to the Chinese Cooperative Law, the board of directors is a body of members who oversees activities such as 1) organising technical training and decision making through general assembly meetings, 2) presenting information about the performance of the past year as well as future challenges, and 3) working out production objectives and budget plans for the next year. The board of supervisors is regarded as a body of members that supervises the operation of the board of directors. The duties of the board of supervisors are mainly 1) ensuring the enforcement of decisions made through general assembly meetings and technical trainings, 2) supervising financial issues, 3)

monitoring the enforcement of duties of directors, and 4) recording the delivery quantity and quality of director members.

The data shows that all the cooperatives in the survey have a merged body of the management and the board (Liang and Hendrikse, 2013). The management therefore consists of both the board of directors and the board of supervisors. Members of the management team are core members.

There are on average three general assembly meetings in 2010 in each cooperative. However, most of the general meetings are held for the sake of production technical trainings, rather than decision-making or voting. Key decisions are made through board meetings. There are on average five and a half formal board meetings in 2010 in the cooperatives in the survey. According to the voting rules presented in Figure 3.3, decisions are made only by core members in 34 cooperatives. Common members participate in the other three cooperatives, but core members still dominate in decision-making, because the proportional voting rule is applied in two of the three cooperatives. Core members have more votes than common members. Figure 3 presents a distribution of members' participation in decision-making reflecting this observation. The horizontal axis stands for members ranging from core members to common members, while the vertical axis refers to the percentage of decision rights. We therefore conclude that decisions in the cooperatives are made mainly by core members, instead of the membership.
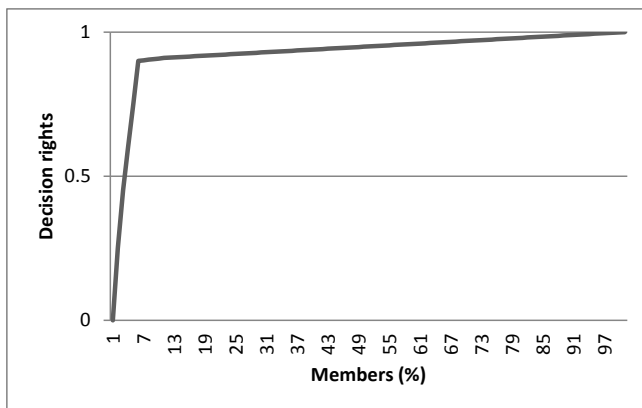
Figure 3.3 Distribution of members' participation in decision-making

3.3.4 Income rights

Income rights are addressed in terms of equity capital (3.4.4.1) and the residual payment scheme (3.4.4.2).

3.3.4.1 Equity capital

Farmers obtain the membership by buying capital shares. According to our investigation, in most cooperatives a farmer needs to buy at least one share of capital. However, in a small proportion of cooperatives, one share is bought by more than one member when they lack money.[28] One share of capital can range from 500 Chinese Yuan (77USD) to 2000 Chinese Yuan (308USD). Cooperatives therefore are usually under-financed by members. Subsidies from the government are another important source of financial support (Liang and Hendrikse, 2013; Sultan and Wolz, 2012).

Information about capital share distributions between core members and common members is presented in Table 3.2. Core members, accounting for 3.5% of the membership, hold nearly half of the equity capital. Besides, chairpersons of cooperatives are the largest shareholders among core members.

Table 3.2 Capital share distribution in cooperatives in the survey

	Number/ proportion
Average membership size	171
Average number of core members	6
Average proportion of core members out of membership (%)	3.5
Average shares that all core members hold (%)	49.1
Average shares that the chairperson holds (%)	16.0

The capital share distribution of the 37 cooperatives is presented in Figure 3.4. The horizontal axis ranges from core members to common members, while the vertical axis refers to the percentage of equity capital in the cooperative. We have only data about the capital share of the chairperson and about the capital share of all the core members jointly. We assume in Figure 3.4 that all the core members except for the chairperson are identical in capital share and all the common members are identical in capital share as well. According to the data in appendix 3, the chairperson has on average 16.0% of the capital shares, which determines the start point of the line in Figure 3.4. Core members (including the chairperson), accounting for 3.5% of the membership, have 49.1% of the capital shares, which determines the kink of the line in Figure 3.4.

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[28] We do not have the data regarding the proportion of cooperatives in which a member was required to have at least one share of capital and that of cooperatives in which one share is owned by several members.
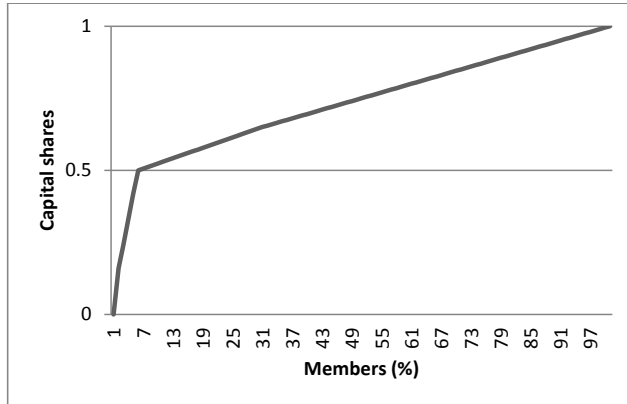
Figure 3.4 Distribution of equity capital

A member who exits the cooperative is reimbursed his initial share capital as well as the accumulated part of his capital. If a member exits the cooperative, there are two ways that he deals with his equity capital. One is that he transfers or sells his equity capital to someone else, either a member of the cooperative or a non-member farmer. The other way is that he withdraws his shares directly from the cooperative. In the latter case, total capital of the cooperative would be reduced and meanwhile shares of each current member increases.

3.3.4.2 Residual payment scheme

Total profits are firstly reserved in the cooperative for risk and future investment, and then allocated to members at the end of the production year. The allocation of profits to farmers is based on patronage, capital share, or both. As Figure 3.5 shows, 73.0% of the cooperatives in the survey distribute profits to farmers on the basis of both patronage and capital share, while 21.6% of the cooperatives distribute profits solely based on patronage and 5.4% solely based on capital share. Among the cooperatives that distribute profits according to both patronage and capital share, on average 56.1% of the profits are distributed on the basis of patronage, while 43.9% are distributed on the basis of capital share, which is almost in line with China's National Cooperative Law that at least 60% of profits distributed to members should be based on patronage.
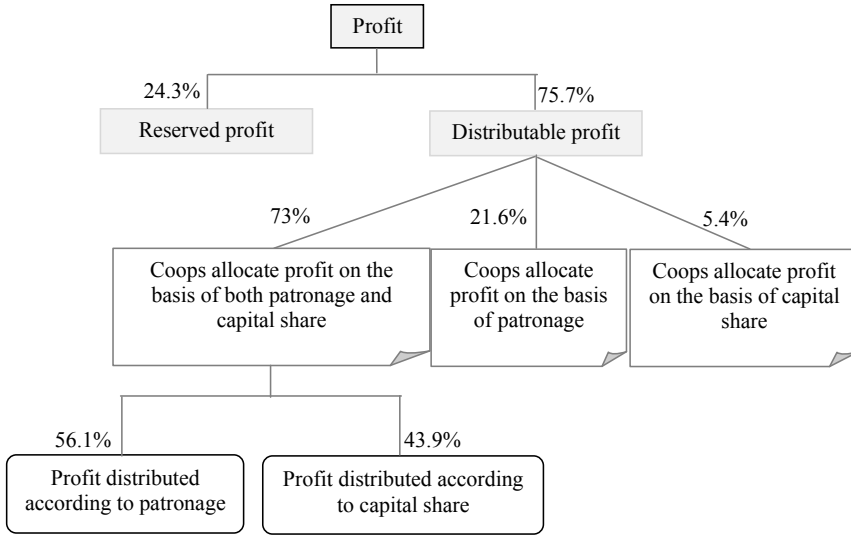
Figure 3.5 Average profit distribution of cooperatives

Data regarding the income of farmers is not available. However, Figures 3.4 and 3.5 enable us to say something about the distribution of income rights. Figure 3.5 indicates that most cooperatives allocate profits to members on the basis of both patronage and capital share. Figure 3.4 reflects that core members have significantly more equity capital shares than common members. However, table 3.1 shows that only 13.5% of the core members are large farmers, i.e. most core members do not have a larger production size than common members. The distribution of income rights is therefore less skewed than the distribution of equity capital. The distribution of profits is presented in Figure 3.6. The horizontal axis ranges from core members to common members, while the vertical axis refers to the percentage of profits allocated to farmers (based on patronage and capital share).
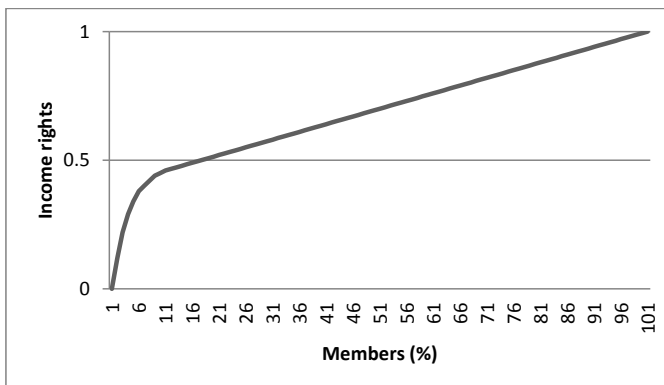
Figure 3.6 Distribution of income rights

3.4 Discussion

An appropriate choice of governance structure will direct activities in a productive way. It addresses coordination, motivation, and cognition problems. Coordination is required when the parties involved have joint interests, but they do not know each other's course of action. Motivation problems are addressed in terms of incentives and authority allocation to reduce conflicts of interests as well as opportunistic behaviors (Feng and Hendrikse, 2011). Opportunistic behavior occurs when an individual, organization, or institution takes advantage of a market or contractual setting with incomplete or asymmetric information (Bijman and Hendrikse, 2003). Harris et al. (1996) point out that member opportunism is a prominent problem in cooperatives. Cooperative members are likely to act opportunistically by either overusing their cooperative or by limiting the amount of capital they provide (Fulton, 1995). Cognition problems in organizations are due to the limited capacities of the involved parties. A governance structure channels attention and cognition, which in turn determines the benefits and costs of various parties (Feng and Hendrikse, 2011).

Ownership rights

Farmer cooperatives are owned collectively by members. Members have the formal rights over the assets (Hendrikse, 2005). Ownership rights reside also with (the majority of) the farmers in a cooperative in China. This is in line with Hart and Moore (1990) and Hendrikse and Veerman (2001). They argue that control over the assets should lie with the agent, or simple majority voting among the group of agents, when an agent or a group of agents is key to an asset.

Farmer cooperatives in China have been characterized for their noncompliance with the general cooperative principle of democratic decision making (Ma and Meng, 2008). All the members have rights to vote formally, but the number of votes differs between members. Formally, in Chinese cooperatives both "one member, one vote" and proportional voting are allowed by the Law on the one hand. The Law specifies that the ceiling regarding voting rights of a single member is 20%. The practice is that common members delegate and relinquish voting rights to core members, because core members are crucially important to the development and success of farmer cooperatives. Common members are aware that they are inferior in capabilities and have to free ride on high ability farmers. They regard that their efforts will not greatly affect the performance of the cooperative. Neither will they expect that their effort will be rewarded. The skewed distribution of ownership rights is addressed in a number of articles. Madhok (1996) shows that the network partner with higher capabilities should have a higher degree of control. Within a pyramid hierarchy, some agents specializing and others coordinating with them, is an efficient decision making structure (Hart and Moore, 2005). Similarly, Hojman and Szeidl (2008) model about network formation shows that the

core-periphery structure is the unique equilibrium architecture and there is a positive correlation between centrality and payoffs.

The fact that core members have most authority may cause opportunistic behaviors (Fulton, 1995; Harris et al., 1996; Huang, 2008). Thus, it is important to alleviate members' opportunistic behavior, which can be done in formal as well as informal ways. Firstly, members' formal exit right can prevent core members' opportunistic behavior to a large extent. Hirschman (1970) argues that exit is an important part of bargaining power. It is in accordance with Holmström's (1999) statement that those who have good market alternatives will surely be well taken care of. Notice that though core members are more important than common members in the operation of farmer cooperatives, core members need the participation of common members as well. Otherwise product quality control, quantity stability, and economies of scale are not realized. Common members' exit may therefore lead to the failure of the cooperative and sequentially curtailing of core members' ambitions. Hence, core members have to balance benefits obtained by behaving opportunistically and losses due to members' exit. However, it has to be acknowledged that 'the exit mechanism operates less effectively in markets in which the costs of switching are high and when information about alternative options is incomplete (Pencavel, 2001). Therefore a member will not easily withdraw unless he has access to alternative outlet. Besides, members have already invested in the cooperative over the years. Their shares may not easily or sufficiently be recouped by transferring or selling, which may also prevent them from exit.

Secondly, voting and voice rights are formally allocated to the whole membership, no matter whether they are used or not. According to the Cooperative Law, the general assembly meeting is the ultimate decision making body in of a cooperative. Common members have the rights to vote and voice against decisions when they are dissatisfied. The formal voting and voicing rights can effectively limit core members from being overly opportunistic. Additionally, it is formally required by the Law that the ceiling of voting rights of a single member is 15% and the ceiling of capital shares of a single member is 20%. Common members are willing to relinquish their decision rights to core members or not using the right as long as they are satisfied with the benefits derived from joining the cooperative.

Decision rights

The distinguishing feature of a cooperative is member dominance. This is reflected in democratic decision-making. However democratic processes are usually slow and costly. Democratic decision-making entails a collective action problem. When ownership is distributed among many members, owners may be less inclined to participate in decision making because (s)he regards the results of the decision as a public good (Olson, 1965). Holmström (1999) regards it infeasible to have a large

number of people directly involved in corporate decision-making.

Democratic decision-making may also elicit influence activities in the decision-making process (Milgrom and Roberts, 1992). Common members may seek to influence decisions. Common members spend time and energy to influence decisions made by core members, while core members spend time and energy to respond to these influence activities as well. Besides, common members may also behave opportunistically by shirking on quality or by delivering through alternative outlets. The cooperative therefore needs to supervise common members' behaviors, which is also costly. Influence activities in cooperatives are observed to be costly (Cook, 1995; Iliopoulos and Cook, 1999; Gripsrud et al., 2000). Efficient organizations anticipate these observations and design their information and decision processes in such a way that these activities are channelled in value creating directions.

Cooperatives may seem to be hampered by having the ownership rights allocated collectively to members, but there are many possibilities for structuring the bylaws, in terms of decision and income rights, in order to design incentives to elicit efficient behavior. One possibility is to distinguish formal and real authority. Formal authority resides with the members, whereas real authority can be either centralized or decentralized (Aghion and Tirole, 1997; Baker et al, 1999; Hendrikse, 2005). The costs of collective decision making may be reduced by delegating formal decision rights informally to another party. Enterprises assign their formal rights of control to their owners, but the decision rights are generally exercised by them in an indirect way through voting for the board of directors, who then selects the management of the firm. Real authority is therefore delegated by the members to the management. The delegation of decision rights to a few people in Chinese cooperatives is consistent with these arguments. Common members in cooperatives in China do not participate in the decision making frequently or at all. Real authority lies with the management, rather than the membership.

The members are facing control problems due to the delegation of decision responsibilities to managers. The precise agency problem depends on the type of enterprise due to differences in the available information (Feng and Hendrikse, 2012). For example, a cooperative lacks a source of information compared to an investor-owned-firm, i.e. a public listing. This makes the provision of incentives and the monitoring of the managers different than in a publicly listed investor-owned-firm (Staatz, 1987; Royer, 1999; Huang, 2008). The management in farmer cooperatives in China differs from cooperatives in other countries due to core members being owners and in the meantime in charge of the management of cooperative enterprises (Lin and Huang, 2007; Huang and Xu, 2008; Xiong and Zheng, 2008). This may be attractive for a number of reasons. Firstly, a member manager is likely to have more knowledge of production as well as the membership, whereas an outside manager is probably more professional in management and marketing (Sexton and Iskow, 1988). Chinese

cooperatives seldom have professional management or marketing. All CEOs and the chairpersons in the cooperatives in the survey were also members. Huang and Xu (2008) argue that the authority allocation structure characterized by the distinction between core and common members and core members being in charge of the management is beneficial, compared to introducing outside management. One reason is that it is not desirable to hire outside managers when cooperatives in China are short of asset capital at this stage. Another reason is that these core members, after investing a large quantity of capital in the cooperative, have interests similar to the cooperative firm. They would devote most of their resources such as asset capital, human capital, and social capital to cooperatives in order to gain more benefits for themselves and meanwhile for the cooperatives as well.

Secondly, cooperatives and investor-owned-firms differ regarding the importance of the formal owners in the decision process. The CEO in an investor-owned-firm often has a large, if not dominant voice, in selecting the board of directors, despite that the board of directors has the legal power (USDA, 2002). The CEO often has substantial control over setting, ratifying and implementing company policy. In a cooperative, the CEO usually has significantly less influence over who sits on the board. Members have a substantial number of seats in the board of directors and they are not dependent on the CEO for their position. They are sufficiently independent to question management decisions and to reject its recommendations (USDA, 2002). The CEOs in Chinese cooperatives are core members. They have sufficient and dominant influence over the management and members, because they have partially consistent interests with other members.

However, due to the merged management and board and the dominant position of the management, the board of supervisors may collude with, rather than supervise, the board of directors. Core members will favor their own benefits at the expense of common members when there are conflicts of interests (Xiong and Zheng, 2008). Core members tend to overuse their rights, including decision rights and income rights, to receive additional rents. Core members may capture rents due to having on the one hand superior information regarding market demand and subsidies from the government and on the other hand the cost for common members to supervise core members' behaviors and performance. Ma and Meng (2008) point out that common members' interests are hurt if core members behave opportunistically by hiding the true profits of cooperatives from common members. For example, the board of directors and the board of supervisors (in a cooperative in the survey) jointly rented an orchard in the name of the cooperative. Revenues from the orchard are distributed on the basis of equity capital and merely between board members, whereas costs of both renting and production of the orchard are covered by the cooperative, i.e. the membership. An effective supervising mechanism is therefore needed to constrain core members' behaviors.

Income rights

Ownership of the cooperative is important for the members, but the actual payments are often more important for them. There are many degrees of freedom to structure the income rights in a cooperative. LeVay (1983, p5) states even that '…cooperatives may behave no differently from other types of enterprise'. It turns out that the income rights in informal, repeated relationships can be structured in such a way that exactly the same distribution of power results in a cooperative as in other enterprises (Baker et al., 2002; Hendrikse, 2007b). However, the actual composition of income rights reflects often that a cooperative is collectively owned by many independent suppliers. Important issues regarding the structuring of income rights in cooperatives are geared towards the timely payment for deliveries (Royer, 1992), the quantity problem (Saitone and Sexton, 2009), dealing with the tension between pooling and member heterogeneity (Hendrikse, 2011), and the control problem (Cook and Plunkett, 2006; Hendrikse, 2011).

A core member generally holds relatively more shares of the cooperative and correspondingly has more income rights, whereas a common member is expected to patronize the cooperative but is seldom involved in operational decision-making. According to the Zhejiang Cooperative Law, a single member is not allowed to hold more than 20% of the total capital of a cooperative, which prevents too much concentration of ownership rights. In spite of the restriction that a single member can not own more-than-20% shares of the equity capital, the majority of the capital shares is still in the hands of core members. Core members in some cooperatives limit common members' equity capital by setting a ceiling amount of shares that each common member can buy, which contributes to the skewed distribution of equity capital.

Income rights have also to be determined regarding capital or investment oriented capital. There are two concerns (Dunn, 1988). Firstly, it will cause a divergence between users and the ownership structure. The distribution of earnings among members will be different than the distribution of votes among members. Secondly, return to the equity capital will place pressure on the cooperative to become investment-oriented and maximize short-run profitability. Hence, most cooperatives return profits on the basis of delivery or patronage. For example, return on capital is limited in the USA. Cook and Plunkett (2006) state that cooperative founders in the United States take three hard-core principles, "one member, one vote", service at cost, and limited return on equity capital. Most state incorporation statutes place specific limits on the rate of profit allocated based on equity capital. Baarda (1986) reports a rate of 8%. However, the income rights distribution mechanism in cooperatives in China deviates from the principle regarding profit distribution of US cooperatives. A small proportion (5.4%) of cooperatives in the survey allocates profits merely on the basis of capital.

Among the cooperatives that allocate profits on the basis of both capital and delivery, nearly half (43.9%) of the profits are distributed on the basis of equity capital, while the other 56.1% of profits are distributed based on delivery.

The proportion of the return based on equity capital versus patronage depends to a large extent on the capabilities of the core members in the cooperative. Core members have superior knowledge over common members and are able to produce more benefits for cooperatives, which needs to be complemented by higher residual income. The allocation of profits based on both patronage and capital share may be desirable. On the one hand, if all the profits are distributed on the basis of patronage, core members would be insufficiently motivated, considering their inputs of asset capital, human capital, and social capital. Sufficient motivation of core members is vital to the development of cooperatives at this start-up stage. On the other hand, if all the profits are distributed according to capital share, small farmers holding a small amount of equity capital will receive nothing except for the sales revenues and they will lack the motivation to join cooperatives. Hence, in order to balance the interests of both core and common members, China's National Cooperative Law requires that the profit distributed on the basis of patronage must be more than 60% of total distributable profit. Though it is essential that common members produce and provide products that meet the demand of consumers, yet more important is that core members use their capabilities to enhance the value of cooperative enterprises by downstream value adding activities and acquiring higher profit in markets.

3.5 Conclusion and further research

Farmers in China differ in asset capital, human resources, and social resources. Some farmers have substantial asset capital, marketing capabilities, or social relations. They are often entrepreneurial and are referred to as "elite" farmers (Huang and Xu, 2008). Examples include persons used to manage private enterprises, those who used to work in the agricultural department of the government, or persons having information about the product supply chain. Meanwhile, there are also common farmers, good at farming, but not experienced at marketing or management. Most farmers in China belong to this latter category. These differences determine different production and marketing strategies as well as objectives between alternative groups of farmers. Farmers with high capabilities seek to realize entrepreneurship in terms of capital investment and authority through the management of cooperatives, whereas common farmers are satisfied by selling their products at reasonable prices. These entrepreneurial farmers organize common farmers into farmer cooperatives. Common members are aware of their lack of knowledge in management and marketing. They delegate voting rights informally to core members. Chinese farmer cooperatives in China therefore are characterized by a skewed allocation of ownership rights, decision rights, and income rights between core and common

members. Core members hold substantial rights over common members.

There are advantages of governance featured by core members holding most power, such as lower decision costs and core members investing more effort in enterprise development. However, there are conflicts of interest in terms of the allocation of income rights between different groups of members. To limit members' opportunistic behavior, formal institutions in terms of members' exit rights, decision rights, and ownership rights specified in the Cooperative Law are important. The current structure of profit distribution is the combined result of both the interaction between heterogeneous members and government guidance. Core members hope that profits are distributed according to capital, whereas common members prefer profits being allocated on the basis of patronage. Since it is core members who are in charge of the management of cooperatives and most core members have substantial capabilities in finance and marketing, rather than production areas or output, it is expected that core members prefer to distribute revenues on the basis of capital contribution. Therefore, the Law specifies that at least 60% of distributable profits must be distributed to members according to patronage, in order to protect the benefits of common members. The data shows that 43.5% of profits are distributed based on equity capital in cooperatives allocating profits both on delivery and capital. It is probably an effective way at this stage to help farmer cooperatives in China to develop towards a direction where cooperatives are able to develop fast and different groups of members are satisfied at the same time.

It is not desirable for cooperatives in China to blindly comply with traditional cooperative principles and it is also not possible (Xu, 2005). It is important that cooperatives learn from history and experiences of developed countries and even more important to develop and adapt to the local economic and cultural environment. A vital feature of cooperatives in China is therefore that they attract key production factors (Xu, 2005). Cooperatives in China are incapable to retain good managers at this stage. Substantial authority may therefore be allocated to core members, as long as the profit distribution satisfies both core and common members, and cooperatives are developing at a relatively high speed. As farmer cooperatives in China develop and as the history of cooperatives in China becomes much longer, members as well as memberships will stabilize and cooperative enterprises' capital accumulation capability will improve; and simultaneously some degree of democracy may be realized in farmer cooperatives in China. Anyway, survival and development are the key issues at the current stage of the development of Chinese farmer cooperatives.

The current paper is devoted to a description of the governance structure of cooperatives in China. This is informative for the study of the governance structure of cooperative enterprises in transition countries. Additional empirical studies in other parts of China regarding the effects of ownership

rights structure, decision rights, and income rights distribution on the performance of farmer cooperatives are desirable. The second possible domain for future research is the effect of the State's institutional arrangements on the structure of farmer cooperatives in China. Carroll et al. (1988) show, based on an empirical study on farmer cooperatives in Hungary, that the structure of the state has significant effects on the organizational structure as well as the behavior of farmer cooperatives. This may result in another life cycle of cooperatives in China than in other parts of the world.

Chapter 4: Cooperative CEO Identity and Efficient Governance: Member or Outside CEO?[29]

Abstract

A principal-agent model is formulated to capture the efficiency of cooperatives with a member CEO and cooperatives with an employed outsider as CEO. Results of the model show that the incentive strength regarding the member CEO is stronger compared to that of the outside CEO in order to shift some effort of the member CEO from individual farming into the task of adding value to the cooperative enterprise. A cooperative with a member CEO is uniquely efficient when upstream and downstream tasks are substitutes to a certain extent, or complements. When the tasks are substitutes, the efficient CEO identity depends on the strength of the substitution effect and the difference of the marginal productivities between the two tasks. The scope of cooperatives with a member CEO being efficient becomes smaller when the substitution effect is at an intermediate level or the productivity difference between the two tasks is limited.

4.1 Introduction

The changing economic environment has led many farmer cooperatives in both developed and developing countries to undertake substantial governance structure changes. Cooperatives adopt various strategies to adapt to different environments and situations. Among these various strategies, the management of cooperatives is regarded as an important tool affecting the economic performance of cooperatives (Fama, 1980; Cook, 1994). Cooperative management differs from the management of investor-owned firms (IOFs) due to the user-owner relationship. The management of an IOF focuses on the objective to maximize the capital investment return for investors, whereas the management of a cooperative has to take into consideration members' interests. Members' interests are more complex than those of owners of IOFs. Owners or members of cooperatives may have not only monetary interests in marketing, but also expectations such as utilizing the cooperative services and finding a home for products. Another aspect of the management difference between cooperatives and IOFs is that managers in a cooperative may also be owners of the cooperative enterprise. A cooperative has therefore to choose as a manager either a member who has residual claim rights of the cooperative or an outsider who is purely employed without residual claim rights. These differences and possibilities will be reflected in the incentives facing the manager in the model presented in this article.

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Cooperatives in different countries differ in the CEO identity. The management of most cooperatives in China is executed by members (Liang & Hendrikse, 2012). Very few cooperatives in China employ outsiders as CEOs. The reverse holds for cooperatives in western countries. Most cooperatives employ outside CEOs as well as outside directors. For example, Burress and Cook (2010) identified only one cooperative with a member CEO in their sample of 1000 cooperatives. This situation is more mixed in Spain and Brazil. These countries have cooperatives with member CEOs as well as cooperatives with outside CEOs.

Member CEOs usually have substantial capabilities in physical capital, marketing, management, or social relations, etc, compared to other common members. A member CEO has multiple roles: a member or supplier of the cooperative, a member of the management, a member of the board of directors, and/or a member of the board of supervisors of the cooperative[30], while other members are mainly producers, inputs suppliers, and residual claimants of the cooperative.

The identity and composition of the management and the board can have an impact on the performance of the cooperative (Cook, 1994; Lang 2002; Dunn et al., 2002). However, little is known about the influence of cooperative CEO identity on the efficiency of the coopertive. We examine the efficient CEO identity of the cooperative. A member CEO is incentivized by ownership and residual claim rights, while an outside CEO receives a fixed salary and a payment based on measured performance. An outside CEO is incentivized to care about member interests and the value of the cooperative enterprise, whereas a member CEO, as both input supplier and an agent, is in addition concerned with the value of his or her individual farm.

This paper addresses the following questions: 1) When is it efficient for a cooperative to delegate the management of the enterprise to a member instead of an outside CEO? 2) What is the optimal incentive intensity regarding each CEO in order to maximize the value of the cooperative enterprise? and 3) What is the optimal effort devoted to tasks by each CEO?

The paper is organized as follows. Theories regarding the management in cooperatives and differences of CEOs in cooperatives and in IOFs are addressed in section 4.2. Section 4.3 is dedicated to the model. Section 4.4 presents the equilibrium results. Efficient CEO identity and task interdependencies are analyzed in section 4.5. Managerial productivity differences are highlighted in section 4.6. Section 4.7 concludes.

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[30] Besides the member CEOs who are both farmers and managers, another type of member CEOs is also observed in cooperatives in China. This latter type of member CEO discards individual farming and focuses on the management of cooperatives. We focus on the former type of member CEO in this study.

4.2 Theory

This section addresses the impact of the management and the board of an enterprise on its performance (4.2.1) and identifies the differences between CEOs in cooperatives and CEOs in IOFs (4.2.2).

4.2.1 Impact of the management and the board on performance

The impact of the management and the board on enterprise performance is addressed in various studies (Daily & Dalton, 1993; Haleblian & Finkelstein, 1993; Adams et al, 2008; Hillman et al, 2007). Board characteristics taken into account are size, composition, CEO duality, and the size of the enterprise. Jensen (1993) suggests that smaller boards have a positive impact on performance due to more effective monitoring. Haleblian and Finkelstein (1993) establish empirically that firms with a large management team perform better. Moreover, firms with dominant CEOs perform worse in a turbulent environment than in a stable environment. Board composition refers to the distinction between inside and outside directors. Studies regarding the relationship between the ratio of outside directors and firm performance vary from positive to zero, to negative. Outside directors may extract and provide important sources from the environment that are unavailable to inside directors (Daily & Dalton, 1993), while inside directors have more information about their firm operation and may perform better when their ownership stake is larger (Jensen & Meckling, 1976; Pearce, 1983). Daily and Dalton (1993) address CEO duality, i.e. the CEO is also the chairperson of the board. They examine two forms of management, i.e. entrepreneurial management and professional management, and find that most founder-managed firms or firms with entrepreneurial management are likely to be characterized by CEO duality. They establish that there is no significant relationship between CEO duality and firm performance. The size of the enterprise is also relevant. The management and the board of directors may be able to more directly influence organizational processes and outcomes in small firms than in large firms (Eisenhardt & Schoonhoven, 1990).

Attention has also been paid to specify management issues in farmer cooperatives (Cook, 1994; Lang 2002; Dunn et al., 2002; Bond, 2009, Burress et al., 2011; Burress & Cook, 2010 and so on). Examples are the role of the management, the compensation of the management, and the impact of the management on the performance of cooperative enterprise. Characteristics of the management and the board that have an effect on performance of cooperatives are size and composition of the board. Bond (2009) establishes that board size exerts a limited influence on the cooperative financial performance. Yet Lang (2002) points out that a reduction in board size can lead to greater accountability, less anonymity, and more efficient board meetings. A negative relationship between size and performance is also indicated by some empirical analyses (Burress & Cook, 2010; Burress et al., 2011).

Agricultural cooperatives are restructuring towards more entrepreneurial organizations (Bijman & Doorneweert, 2008), as the market competition between enterprises is becoming more and more fierce.

Bond (2009) argues that cooperatives' boards may suffer from more severe governance problems than their corporate counterparts like IOFs due to the identity of directors. Identity of directors refers to inside directors who are members and outside directors who are non-members. Therefore inside directors and outside directors are also called owner-directors and non-member directors respectively. Owner-directors of cooperatives are often professionals in agricultural production technique and management. However, they are not always sufficiently professional in making sound decisions and firm management. Lang (2002) observes that even capable member directors lack the range of skills needed on the board. In addition, owner-directors may use power to make decisions that benefit the individual at the expense of the cooperative enterprise (Dunn et al., 2000). The employment of full-time and professional board members therefore is recommended (Dunn et al., 2000; Bond, 2009). However, Burress and Cook (2010) think owner directors are more likely to make value-maximizing decisions because they bear the wealth effects of their actions. Besides, an active and engaged board contributes to higher performance of the cooperative. Burress et al. (2011) find no support for a relationship between board equity holdings and performance.

Ownership is an important factor in influencing job design and incentive contracting. The idea that stock ownership by management can reduce the underlying agency problem follows directly from agency theory. More stock owned by the management provides stronger motivation to work and raises the value of the firm's stock (Hermalin & Weisbach, 1991). When the agent owns the asset returns, he or she will be more motivated to pursuing the value of the asset (Holmström & Milgrom, 1991). Therefore low-powered incentives may be sufficient to motivate the agent. Holmström and Milgrom (1991) further elaborate the favorable conditions for an agent to own the assets, i.e. that the agent is not too risk averse, the variance of asset returns is low, and the variance of measurement error in other aspects of the agent's performance is low.

4.2.2 CEOs in cooperatives versus investor-owned firms

CEOs play a significant role in the performance of an organization (Thomas, 1988). CEOs' behavior, compensation, and their relationship with performance are studied frequently by applying the principal-agent model (Tosi Jr. & Gomez-Mejia, 1989; Garen, 1994; Haubrich, 1994; Wang 1997). Agency relationships exist whenever an individual or organization (the agent) acts on behalf of another (the principal) (Ortmann & King, 2007). Principal-agent problems arise because the interests of the agent are usually not the same as the interests of the principal. The agent may therefore not completely pursue the interests of the principal (Royer, 1999; Sykuta & Chaddad, 1999).

Most principal-agent studies focus on CEOs in corporations or investor-owned firms, rather than user-owned cooperatives. The relationship in cooperatives is more complex than that in IOFs (Staatz, 1987; Cook, 1994; Royer, 1999; Huang, 2008). There are various reasons, like memberships in cooperatives are more heterogeneous than shareholders in an IOF (Staatz, 1987; Royer, 1999); sometimes a CEO in a cooperative has dual identities, an agent and meanwhile a member (Huang, 2008); cooperatives have to take the interests of two stages of production into account (Feng & Hendrikse, 2012), and so on. CEOs in cooperatives and in IOFs are different in terms of several dimensions. Firstly, CEOs of a cooperative and an IOF have different objectives. CEOs in a cooperative maximize returns to patron members, while CEOs in IOFs try to maximize returns to investors (Hueth & Marcoul, 2009). Members are users and in the meantime owners of the cooperative enterprise. Members therefore have at least two sets of concerns, i.e. owner concerns and user concerns (Feng & Hendrikse, 2012). Owner concerns involve the security and overall profitability of their investments in the cooperative, while user concerns are issues of the pricing and quality of product and services. CEOs in cooperatives therefore bring the downstream enterprise to value and in the meantime serve upstream member interests.

Secondly, incentive mechanisms between the CEOs' performance in a cooperative and in an IOF are different. The distinguishing feature of a cooperative's residual rights, their restriction to the patron agents, prevents them from being publicly listed, which leads to the absence of marketable common stock in cooperatives (Staatz, 1987; Royer, 1999; Hendrikse, 2007b; Feng & Hendrikse, 2012). Therefore the value of cooperative enterprises is not easy to be measured and subsequently designing incentive contracts for a cooperative CEO seems not easy. The compensation for CEOs in cooperatives is expected to be less reliant on performance incentives (Hueth & Marcoul, 2009). Feng and Hendrikse (2012) examine the different roles of a CEO in a cooperative and a CEO in an IOF, taking into account the absence of public listing of a cooperative. They determine the circumstances where cooperatives and IOFs are respectively efficient in a multi-task principal-agent model. There are two concerns that a CEO of a cooperative cares about, bringing the downstream enterprise to value and serving upstream member interests. They consider only the case of a cooperative with an outsider as CEO. However, many cooperatives, especially in China, Spain, and Brazil, have one of the members as a CEO, rather than employing an outsider. A member CEO not only devotes attention to member interests and enterprise value, but also dedicates effort to his or her individual farm. Out model is geared towards the implication of the distinction between a member CEO and an outside CEO.

4.3 Model

A principal-agent model is formulated to capture the efficiency of cooperatives with different CEOs: a member CEO and an outside CEO. A member CEO has a dual identity in being a CEO as well as a member of the cooperative. We assume that members are on the one hand independent input suppliers and on the other hand residual claimants of the enterprise. Members therefore receive incomes of both individual farming and allocated revenue of the downstream enterprise's profits.

A cooperative either has a member CEO or an outside CEO. They are distinguished by their activities. A member CEO allocates efforts between the two tasks of individual farming and enterprise's value adding activities, while an outside CEO has no farming activities and focuses therefore only in value adding activities at the cooperative enterprise.[31] Assume that the membership size of a cooperative is n. Let n^m be the number of members not being CEO. Therefore $n^m = n - 1$ in the cooperative with a member CEO, while $n^m = n$ in the cooperative with an outside CEO. A member not being CEO devotes all his or her effort to individual farming. Both the member CEO and the outside CEO are assumed to be risk-neutral.

The production function of the CEO is

$$y^c = f_U a_U^c + f_D a_D^c,$$

where a_U^c and a_D^c are the CEO's effort in the upstream farming task and effort in the downstream value adding activities respectively, and f_U and f_D are the marginal productivities of the upstream farming activity and downstream value adding activity. Each activity is nonnegative.

A member not being CEO devotes all his or her effort to individual farming. The production function of member j is

$$y^j = f_U a_U^j,$$

where a_U^j is the upstream production activity of member j, $j = 1, 2, ..., n^m$.

Assume that the function of personal cost related to each player's activities is:

$$c(i) = \frac{\left(a_U^i\right)^2}{2} + k a_U^i a_D^i + \frac{\left(a_D^i\right)^2}{2},$$

where $-1 < k < 1$ (Dixit, 2002; Feng & Hendrikse, 2012) and $i = c, j$, $c = out, in$ and $j = 1, 2, ..., n$. The parameter k captures the interdependencies between upstream farming and downstream value adding activities. If k is positive (negative), then the two activities are substitutes (complements).

When the two activities are substitutes, more effort in one activity increases the marginal cost of the other. An example is that the more time spent on farming, the less time a CEO spends on marketing. When the two activities are complements, more effort in one activity benefits the other activity. An example is the coordination between production and processing. Production according to standardized quality may one the one hand reduce the cost of grading and on the other hand enhance value-added processing.

Assume that the wage paid to the CEO is a linear function, i.e. $w = s + b f_D a_D^c$, where s refers to the fixed salary and b captures the bonus rate based on measured performance of the CEO. The payoff (utility) function of member j consists of his or her farm payoff and the residual claim payoff, that is

$$\pi^j = f_U a_U^j + (\tfrac{1-b}{n} f_D a_D^c - \tfrac{s}{n}) - \tfrac{\left(a_U^j\right)^2}{2}.$$

The payoff (utility) function of the outside CEO is

$$\pi^{out} = s^{out} + b^{out} f_D a_D^{out} - \tfrac{\left(a_D^{out}\right)^2}{2}.$$

The payoff (utility) function of the member CEO consists of his or her income from being a member and his or her wage as CEO, that is

$$\pi^{in} = f_U a_U^{in} + (\tfrac{1-b^{in}}{n} f_D a_D^{in} - \tfrac{s^{in}}{n}) + s^{in} + b^{in} f_D a_D^{in} - \left[\tfrac{\left(a_U^{in}\right)^2}{2} + k a_U^{in} a_D^{in} + \tfrac{\left(a_D^{in}\right)^2}{2}\right].$$

The total surplus of the n^m members is

$$\pi^m = \sum_{j=1}^{n^m} \left[f_U a_U^j + \tfrac{1-b}{n} f_D a_D^c - \tfrac{s}{n} - \tfrac{\left(a_U^j\right)^2}{2} \right].$$

Total surplus, i.e. the payoff of the CEO and the common members, is

$$\pi_T = \pi^c + \pi^m,$$

where $c = out, in$. We have therefore

$$\pi_T = \sum_{j=1}^{n^m} f_U a_U^j + f_U a_U^c + f_D a_D^c - \left[\sum_{j=1}^{n^m} \tfrac{\left(a_U^j\right)^2}{2} + \tfrac{\left(a_U^c\right)^2}{2} + k a_U^c a_D^c + \tfrac{\left(a_D^c\right)^2}{2} \right].$$

The game consists of two stages. In the first stage, incentives of the CEO are determined. In the second stage, the CEO and the members choose simultaneously activities that maximize their payoff.

4.4 Equilibrium

The backward induction method is used to solve the game. Firstly, the payoff maximizing activities of

the players are decided, given the incentive strength. The equilibrium incentive strength regarding the CEOs' compensation is determined next.

Each member chooses the effort to $max_{a_U^j} \pi^j$ and simultaneously the CEO chooses his or her optimal effort by maximizing his or her payoff, i.e. $max_{a_U^c, a_D^c} \pi^c$. In the cooperative with an outsider as CEO, the payoff maximizing activity of the CEO is $a_D^{out*} = b^{out} f_D$, while in the cooperative with a member CEO, the payoff maximizing activities of the member CEO are $a_U^{in*} = \left[f_U - \frac{(1+nb^{in}-b^{in})}{n} k f_D\right]/(1-k^2)$ and $a_D^{in*} = \left[\frac{(1+nb^{in}-b^{in})}{n} f_D - k f_U\right]/(1-k^2)$. The payoff maximizing activity of member j in both the cooperative with an outside CEO and the cooperative with a member CEO is $a_U^{j*} = f_U$.

Neither the activities of the outside CEO nor the activities of each member is influenced by the membership size. However, the activities of the member CEO are affected by the membership size. The surplus produced by the member CEO's downstream task is distributed to the whole membership. The larger the membership size, the less effort the member CEO puts into the downstream task, given the level of bonus rate. However, if all the surplus from the downstream task is allocated to the member CEO, then the activities of the member CEO are independent of the membership size.

The members are the principals. They choose the bonus rate that maximizes their total payoff. Anticipating the activities of the CEO, the principals chooses a bonus rate to motivate the CEO. Suppose that b^{c*}, where c = out, in, is the bonus rate that maximizes the payoff of the membership. The identity of the principals differs between the two cooperatives. Consider firstly the cooperative with an outside CEO. The equilibrium bonus rate is $b^{out*} = 1/2$. Activities of both the CEO and each member are independent of the membership size. The bonus rate is therefore independent of the membership size as well.

In the cooperative with a member CEO, both the member CEO and members are the principals. The equilibrium bonus rate in the cooperative with a member CEO is $b^{in*} = 1$. Since the payoff of the member CEO is included as part of the total payoff of the members and the CEO has the rights to choose the bonus rate for himself as well, a stronger incentive leads to a higher surplus of the cooperative.

The incentive intensity regarding the member CEO is stronger compared to the outside CEO. This result is distinct from, but closely related to, the observation of Holmstrom and Milgrom (1991) that the incentives offered to employees in firms are lower than that offered to independent contractors. Employees in their model have no ownership rights over the asset, while contractors use and develop

their own assets and they shoulder risks of the asset. The member CEO therefore needs a higher incentive. In addition, the member CEO's farming task is regarded by the membership as an outside or private activity of the member CEO, whereas the surplus produced by the downstream task belong to the cooperative. A higher bonus rate therefore is needed to motivate the member CEO to devote effort to the downstream task over the upstream task.

The total surplus, and its composition, is determined by plugging the equilibrium value of the various activities in the surplus expression. The equilibrium payoff of the outside CEO is

$$\pi^{out} = s + \frac{f_D^2}{8}.$$

The equilibrium payoff of the members in the cooperative with an outside CEO is

$$\pi^m = \frac{n}{2} f_U^2 + \frac{f_D^2}{4} - s.$$

The total surplus when the cooperative has an outsider as CEO is

$$\pi_T^{out} = \frac{n f_U^2}{2} + \frac{3 f_D^2}{8}.$$

The equilibrium payoff of the member CEO is

$$\pi^{in} = \frac{n-1}{n} s + \frac{f_U^2 + f_D^2 - 2k f_U f_D}{2(1-k^2)}.$$

The equilibrium payoff of the members in the cooperative with a member CEO is

$$\pi^m = \frac{(n-1) f_U^2}{2} - \frac{n-1}{n} s.$$

The total surplus when the cooperative has a member CEO is

$$\pi_T^{in} = \frac{f_U^2 + f_D^2 - 2k f_U f_D}{2(1-k^2)} + \frac{(n-1) f_U^2}{2}.$$

4.5 Efficient CEO identity and task interdependencies

Let $\Delta\pi = \pi_T^{in} - \pi_T^{out}$, i.e. $\Delta\pi$ captures the difference in surplus between the cooperative with a member CEO and the cooperative with an outside CEO in equilibrium. We have therefore

$$\Delta\pi = \frac{(4 f_U^2 + 3 f_D^2)k^2 - 8k f_U f_D + f_D^2}{8(1-k^2)}.$$

If there is no interdependency between the upstream farming activity and the downstream value adding activity, i.e. $k = 0$, the payoff difference

$$\Delta\pi = \frac{f_D^2}{8} \geq 0.$$

Therefore the cooperative with a member CEO is always efficient, if there is no interdependency between the member CEO's upstream farming task and downstream value adding task. When the two tasks are complements, i.e. $-1 < k < 0$, the cooperative with a member CEO is the unique efficient governance structure, i.e. $\Delta\pi > 0$.

When the two tasks are substitutes, i.e. $0 < k < 1$, the efficient CEO identity depends on both the substitution effect between tasks and the marginal productivity of tasks. There are two reasons why a cooperative with a member CEO may become inefficient when tasks are substitutes: the size of the substitution effect and productivity differences between tasks. The first reason is a high level of k. This increases the cost level. The effort that the member CEO puts in one task will increase the cost of the other task, which is disadvantageous to the cooperative with a member CEO. The disadvantageous substitution effect is compensated for by the stronger incentive for the member CEO when k is small. In addition, the member CEO tends to put most effort in one task when k is quite large to eliminate the disadvantage caused by the substitution effect. Therefore when the two tasks are substitutes, the

cooperative with a member CEO is efficient if $0 < k < \dfrac{4f_U f_D - \sqrt{12(f_U f_D)^2 - 3f_D^4}}{4f_U^2 + 3f_D^2}$ or

$\dfrac{4f_U f_D + \sqrt{12(f_U f_D)^2 - 3f_D^4}}{4f_U^2 + 3f_D^2} < k < 1$, whereas the cooperative with an outside CEO is efficient at

intermediate levels, i.e. $k \in \left(\dfrac{4f_U f_D - \sqrt{12(f_U f_D)^2 - 3f_D^4}}{4f_U^2 + 3f_D^2}, \dfrac{4f_U f_D + \sqrt{12(f_U f_D)^2 - 3f_D^4}}{4f_U^2 + 3f_D^2}\right)$, subject to $f_D/f_U < 2$.

The second reason for the inefficiency of a cooperative with a member CEO is the productivity difference between alternative tasks. The cooperative with a member CEO may be efficient when the productivity difference between tasks is large because the CEO can devote most effort to the task with higher productivity. Besides, the stronger incentive for the member CEO creates an advantageous impact. To be more specific, if the ratio of the value adding task's marginal productivity to the farming task's marginal productivity, f_D/f_U, is larger than $\dfrac{4k + 2k\sqrt{3(1-k^2)}}{1+3k^2}$ or smaller than $\dfrac{4k - 2k\sqrt{3(1-k^2)}}{1+3k^2}$, then a cooperative with a member CEO is efficient. However, if the ratio f_D/f_U is between $\dfrac{4k - 2k\sqrt{3(1-k^2)}}{1+3k^2}$ and $\dfrac{4k + 2k\sqrt{3(1-k^2)}}{1+3k^2}$, then a cooperative with an outsider as CEO is uniquely efficient.

Efficient governances as a function of the level of the task interdependencies and the productivity differences are depicted in Figure 4.1. A cooperative with an outside CEO is efficient in the grey area, while a cooperative with a member CEO is efficient outside the gray area.
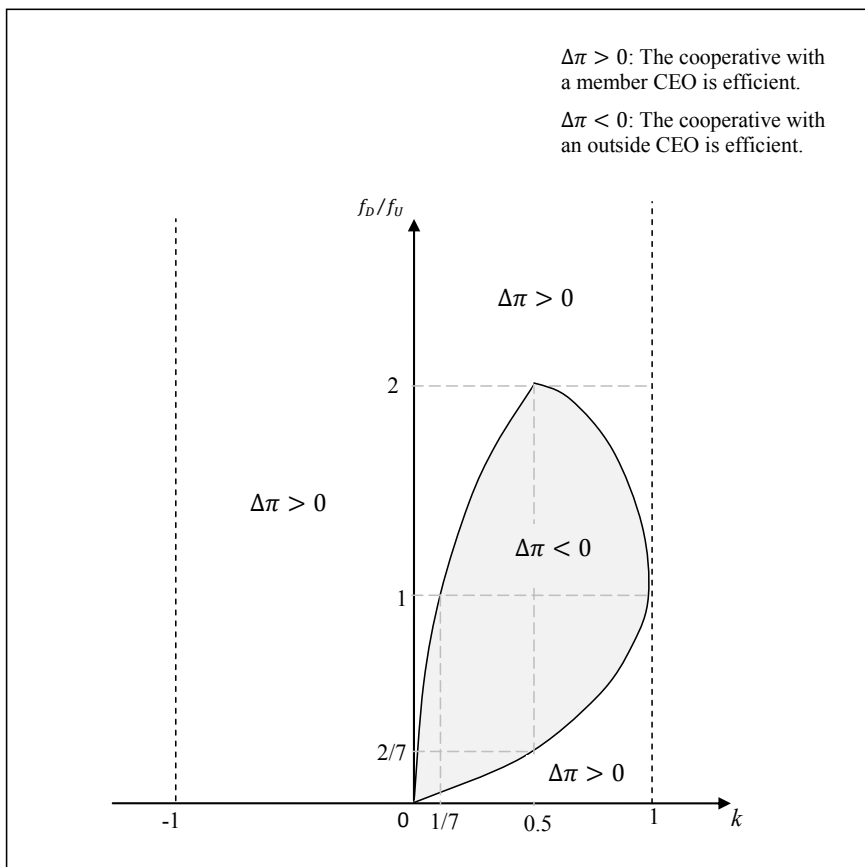
Figure 4.1 Efficient governance, task interdependencies, and marginal productivities

The complementarity between tasks provides an advantage to the cooperative with a member CEO. The effort that the member CEO devotes to one task reduces the cost of the other task, which determines the attractiveness of the cooperative with a member CEO. Cooperatives with member CEOs are therefore uniquely efficient when $k < 0$.

All the members, in both the cooperative with a member CEO and the cooperative with an outside CEO, devote the same effort f_U to their farming. The member CEO receives a stronger bonus incentive than the outside CEO. The member CEO therefore provides more effort than the outside CEO, both on the individual farming task and on the enterprise's value adding task. The cooperative with a member CEO is also efficient when $k = 0$.

The substitution effect creates additional cost of one task by devoting effort to the other task. Tasks being substitutable therefore have an unfavorable impact on the cooperative with a member CEO

since the member CEO has multiple tasks while the outside CEO focuses on one task. The cooperative with a member CEO therefore is still desirable when the substitution effect is very small because the stronger incentive effect more than compensates for the disadvantageous substitution effect. As the substitution effect increases, the cooperative with an outside CEO is likely to become an efficient governance structure due to the disadvantage in the costs of the member CEO. However, if the substitution effect increases to such an extent that the member CEO would devote most effort in one task and little or no effort in another, the cooperative with a member CEO is desirable again.

When the productivity of the downstream task is more than double the productivity of the upstream task, the cooperative with a member CEO is always efficient. There are two reasons. Firstly, the effort allocation of the member CEO would be skewed to the downstream task because of its high productivity. Secondly, the stronger incentive motivates the member CEO to devote more effort to the downstream task. However, the cooperative with a member CEO may become inefficient due to the productivity difference between alternative tasks is limited. It elicits similar levels of activity, and therefore a high level of the interaction term in the cost function. Another way of formulating this argument is that the disadvantage of the substitution effect is prevented in a cooperative with a member CEO by allocating effort to only one task, the one with the higher marginal productivity. This occurs when the difference of the marginal productivity between the two tasks is sufficiently large. For example, if the marginal productivity of the value adding business activities is much higher than that of farming, then the member CEO would devote most of his or her effort to the value adding task and little effort to the farming task. If the marginal productivity of farming is much higher than that of the downstream value adding activities, the member CEO would invest as much effort as possible in his or her individual farming task and little effort in the value adding task. As a consequence, the disadvantage derived from the two tasks being substitutable would be counterbalanced by allocating most of the effort to the task with the high marginal productivity.

4.6 Managerial productivity differences

The efficiency of enterprises with different identities of managers as well as directors of cooperatives has always been discussed. LeVay (1983) argues that farmer directors of farmer cooperatives are more production-oriented, while outside experts are more market-oriented. Outside directors have more information regarding the external market environment (Burress et al., 2011). In addition, Lind (2011) thinks that farmer directors lack knowledge regarding markets as well as product development. Therefore, we may have to consider the case when the member CEO and the outside CEO differ regarding the marginal productivity of the value-adding task. According to Hermalin and Weisbach (1991), outside directors do a better job of acting in shareholders' interests than insiders when it

comes to certain aspects of their jobs such as external information acquisition, whereas insiders are more likely to be preferred in other aspects such as information about the enterprise. Cook (1994) maintains that technical industry skills must be balanced with exceptional communication skills (such as conflict resolution, resource allocation, and information spokesperson) and the ability to develop group cohesiveness.

This section addresses how the equilibrium results and the efficient governance structure depend on productivity differences between a member CEO and an outside CEO regarding the downstream task. The current model assumes that the member CEO and the outside CEO have the same marginal product with regard to the downstream value adding activity. However, a member CEO may be not as capable as a specialized outside CEO in the value-adding task. Denote the marginal productivities of the downstream value adding activities of the member CEO and the outside CEO to be f_D^{in} and f_D^{out} respectively. Then the equilibrium total payoff of the cooperative with a member CEO is $\pi_T^{in} = \frac{f_U{}^2 + (f_D^{in})^2 - 2kf_U f_D^{in}}{2(1-k^2)} + \frac{(n-1)f_U{}^2}{2}$, while the total payoff of the cooperative with an outside CEO is $\pi_T^{out} = \frac{nf_U{}^2}{2} + \frac{3(f_D^{out})^2}{8}$. As previously defined, $\Delta\pi = \pi_T^{in} - \pi_T^{out}$. Therefore

$$\Delta\pi = \pi_T^{in} - \pi_T^{out} = \frac{(f_D^{in})^2 - 2kf_U f_D^{in} + f_U{}^2}{2(1-k^2)} - \frac{f_U{}^2}{2} - \frac{3(f_D^{out})^2}{8}.$$

We rewrite $\Delta\pi$ as

$$\Delta\pi = \frac{(f_D^{in} - kf_U)^2}{2(1-k^2)} - \frac{3(f_D^{out})^2}{8}.$$

Let $\Delta\pi = 0$. We have $\frac{(f_D^{in}-kf_U)^2}{2(1-k^2)} - \frac{3(f_D^{out})^2}{8} = 0$, i.e. $f_D^{out} = \left| \frac{2}{\sqrt{3(1-k^2)}} (f_D^{in} - kf_U) \right|$. Hence, when $f_D^{out} > \left| \frac{2}{\sqrt{3(1-k^2)}} (f_D^{in} - kf_U) \right|$, the cooperative with an outside CEO is efficient, and vice versa.

The relationship between efficient CEO identity and downstream marginal productivity differences are investigated now. Distinguish the cases no interdependency, complementarity, and substitution between the upstream and downstream tasks. Figure 4.2 depicts the relationship when tasks are independent. When $k=0$, we have $f_D^{out} = \frac{2}{\sqrt{3}} f_D^{in}$. The cooperative with an outside CEO is efficient if $f_D^{out} > \frac{2}{\sqrt{3}} f_D^{in}$, while the cooperative with a member CEO is efficient if $f_D^{out} < \frac{2}{\sqrt{3}} f_D^{in}$. A cooperative with an outside CEO is efficient if it is located in the grey area above the line $f_D^{out} = \frac{2}{\sqrt{3}} f_D^{in}$. It is located above the dotted line $f_D^{out} = f_D^{in}$. This is in line with Figure 4.1, i.e. when $k=0$ and CEOs have identical marginal productivity of the downstream task, the cooperative with a member CEO is
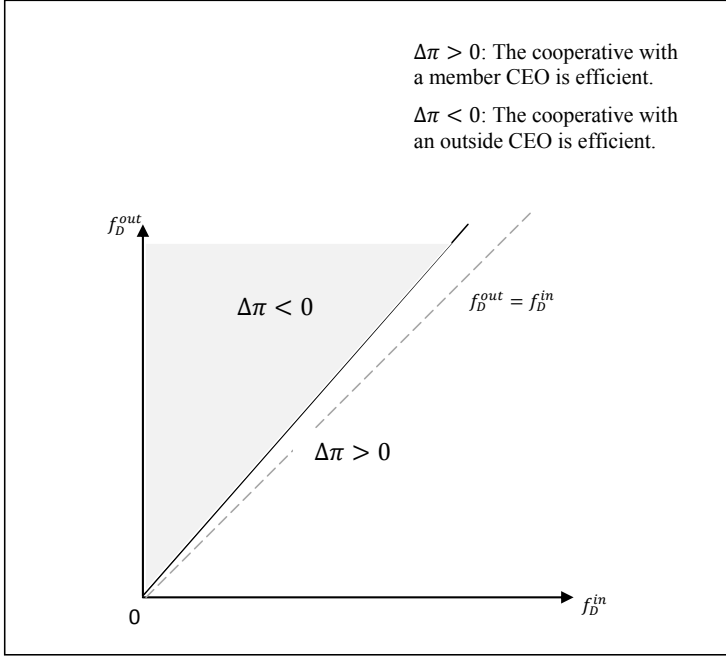
efficient.

Figure 4.2 Efficient governance structure when $k=0$

Figure 4.3 depicts the relationship when tasks are complements. When $-1<k<0$, the cooperative with an outside CEO is efficient if $f_D^{out} > \frac{2}{\sqrt{3(1-k^2)}} f_D^{in} - \frac{2kf_U}{\sqrt{3(1-k^2)}}$, i.e. if it is located in the grey area above the line $f_D^{out} = \frac{2}{\sqrt{3(1-k^2)}} f_D^{in} - \frac{2kf_U}{\sqrt{3(1-k^2)}}$. It becomes steeper as k decreases. The value of the slope is between $\left(\frac{2}{\sqrt{3}}, \infty\right)$. The line $f_D^{out} = \frac{2}{\sqrt{3(1-k^2)}} f_D^{in} - \frac{2kf_U}{\sqrt{3(1-k^2)}}$ is located above the dotted line $f_D^{out} = f_D^{in}$. This result is consistent with Figure 4.1, i.e. when $k<0$ and CEOs are identical in marginal productivity of downstream task, the cooperative with a member CEO is uniquely efficient.
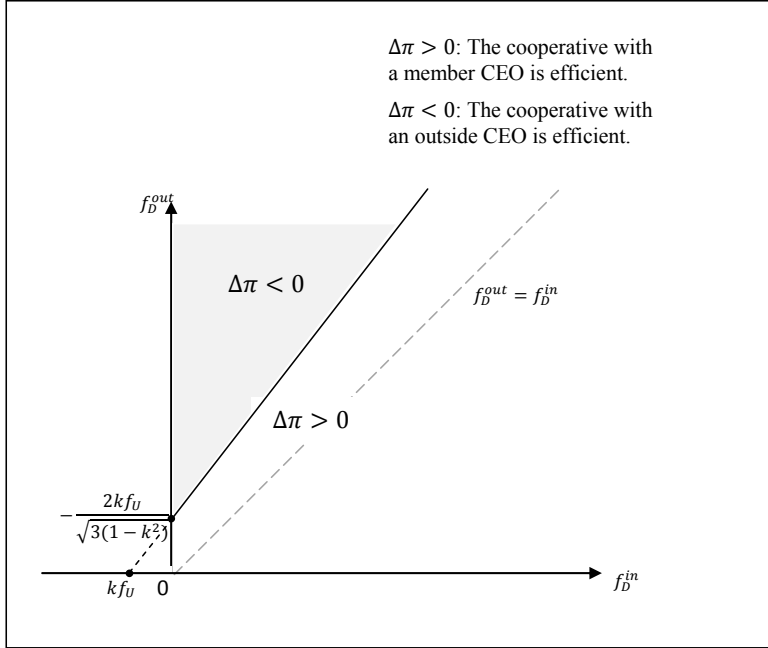
Figure 4.3 Efficient governance structure when $-1 < k < 0$

Figure 4.4 depicts the relationship when tasks are substitutes. When $0 < k < 1$, the cooperative with an outside CEO is efficient if $f_D^{out} > (kf_U - f_D^{in})\frac{2}{\sqrt{3(1-k^2)}}$ subject to $f_D^{in} < kf_U$, while the cooperative with an outside CEO is efficient if $f_D^{out} > \frac{2}{\sqrt{3(1-k^2)}}(f_D^{in} - kf_U)$ subject to $f_D^{in} > kf_U$. The cooperative with an outside CEO is therefore efficient if it is located in the grey area above the two lines. Both lines will be steeper as k increases. The intercept increases as k increases. There are two intersection points between the line $f_D^{out} = \left|\frac{2}{\sqrt{3(1-k^2)}}f_D^{in} - \frac{2kf_U}{\sqrt{3(1-k^2)}}\right|$ and the dotted line $f_D^{out} = f_D^{in}$. The intersection point A is characterized by $f_D^{out} = f_D^{in} = \frac{4k - 2k\sqrt{3(1-k^2)}}{1+3k^2}f_U$, while point B is characterized by $f_D^{out} = f_D^{in} = \frac{4k + 2k\sqrt{3(1-k^2)}}{1+3k^2}f_U$. This is in line with figure 4.1.
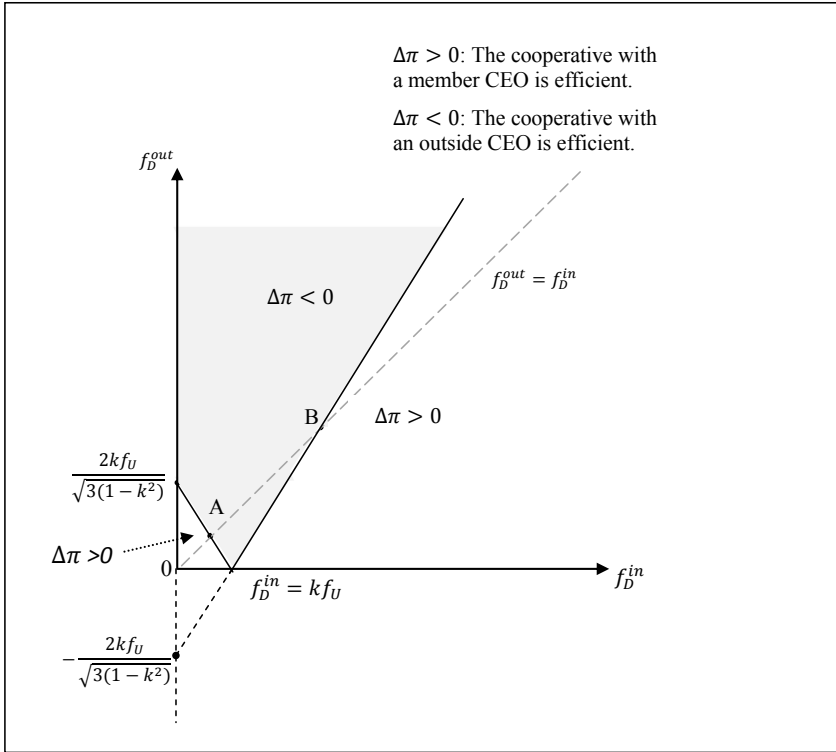
Figure 4.4 Efficient governance structure when 0<k<1

The relationship between efficient CEO identity, task interdependence, and the downstream productivity differences is summarized in Figure 4.5. The cooperative with an outside CEO is efficient when it is located in the grey area above the curve. Given f_D^{out}/f_D^{in}, there is more scope for cooperatives with member CEOs being efficient when the upstream and downstream tasks are complementary, interdependent, or when the substitution effect is small or large. Given k, there is more scope for cooperatives with member CEOs being efficient when the difference between the marginal productivities of outsiders and member CEOs is small.

When $\frac{f_D^{out}}{f_D^{in}} = 1$, the efficient governance structure depends on both k and the productivity difference between upstream and downstream tasks. If $f_D > 2f_U$, then the cooperative with a member CEO is uniquely efficient. If $f_D < 2f_U$, then the cooperative with a member CEO is efficient when k is small or large. Otherwise the cooperative with an outside CEO is efficient. This is in line with observations from Figure 4.1. Suppose that dotted line C reflects $\frac{f_D^{out}}{f_D^{in}} = 1$ when $f_D < 2f_U$, while the dotted line D

60

reflects $\frac{f_D^{out}}{f_D^{in}} = 1$ when $f_D > 2f_U$. The curve $\Delta\pi = 0$ therefore has two intersection points with the line

$\frac{f_D^{out}}{f_D^{in}} = 1$ when $f_D < 2f_U$ and has no intersection point with the line $\frac{f_D^{out}}{f_D^{in}} = 1$ when $f_D > 2f_U$.
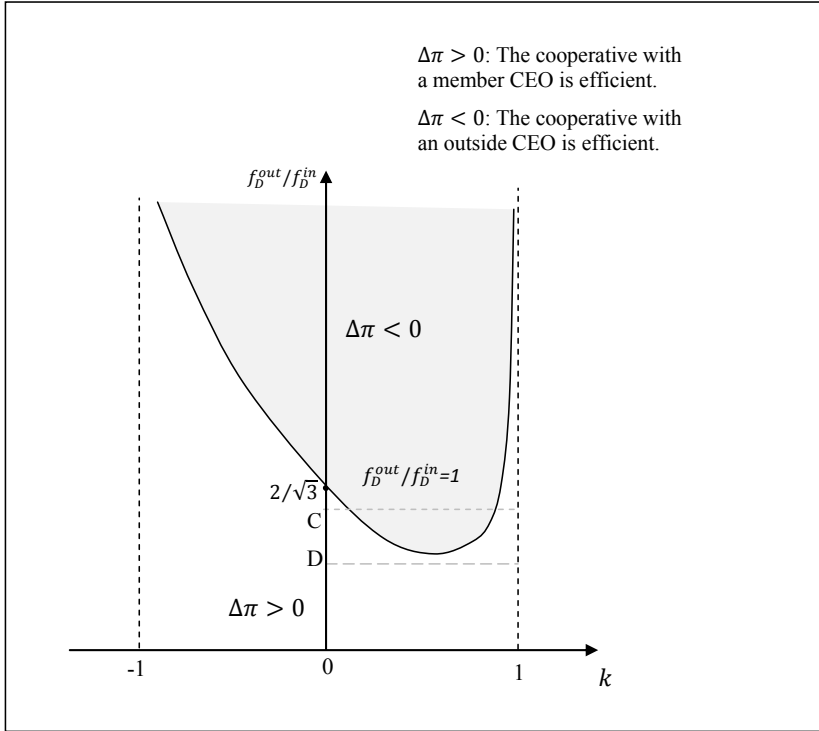
Figure 4.5 Efficient governance, task interdependence, and downstream productivity differences

Take cooperatives in China as an example to illustrate the results of the model. Cooperatives in China are generally in the start-up stage and most cooperative enterprises are characterized by small membership size and locality. Most cooperatives only have the first-stage processing such as packing rather than further processing. There is either no significant interaction, or a small negative (substitute) interdependency effect between the upstream farming and the downstream value adding activities. Cooperatives in China therefore favor member CEOs over outside CEOs. However, when cooperatives have been developing for many decades or even more than a century, they have a highly advanced and complicated value adding business. Most cooperatives in the Western world belong to this type. Given the limited time of a member CEO, the substitution effect between alternative businesses is large and a professional management therefore is necessary.

In addition, it is difficult for farmer cooperatives in China to sufficiently motivate outside

professionals due to the under-development of cooperative enterprises. Professionals with high productivity would like to choose large companies rather than farmer cooperatives. Outside professionals willing to work in cooperatives may not be characterized by high productivity. The difference in productivities between member CEOs and outside professionals is small. Hence, cooperatives in China benefit from member CEOs. Nevertheless, as cooperatives in China develop in terms of member heterogeneity and enterprise size, and as the intensity of marketing competition increases, more and more member CEOs who lack professionalized training in marketing and management feel it beyond their capabilities to take charge of the marketing or the running of cooperative enterprises. Outside CEOs may become a good choice.

4.7 Conclusions

Management behavior in cooperatives is different from that in investor-owned firms. One of the distinctive features is that the manager in a cooperative can meanwhile be a member, and therefore an owner, of the cooperative enterprise. We compare the efficiency of a cooperative with a member as CEO and a cooperative with an outsider as CEO. Results of the model show that CEO identity, either a member of the cooperative or an employed outsider, affects the economic performance of the cooperative. The condition in which a member CEO or an outside CEO is efficient depends on marginal productivities of the upstream and downstream tasks, as well as the relationship between upstream farming and downstream value adding tasks.

When the tasks are complementary and when alternative CEOs have the same marginal productivity regarding the downstream value adding activity, a cooperative with a member CEO is always efficient, compared to a cooperative with an outside CEO. The efficiency of CEO identity depends on the marginal productivities as well as the size of the substitution effect between upstream and downstream tasks. In cases where the difference of the marginal productivity between upstream and downstream tasks are sufficiently large and/or where the substitution effect of upstream and downstream tasks is sufficiently small or large, cooperatives with member CEOs are efficient. Otherwise, cooperatives with outside CEOs are efficient.

CEOs with different identities may differ in marginal productivity regarding the downstream value-adding activities. Outside CEOs tend to be more professional in management and marketing, while member CEOs are likely to be more production-oriented. Therefore, the scope for cooperatives with member CEOs being uniquely efficient becomes smaller when the marginal productivity of outside CEOs' value adding activity is larger than that of member CEOs' value adding activity, and vice versa. The interdependency between upstream and downstream tasks matters to the efficiency of alternative governance structures as well. When the two tasks are complements, as the interdependence becomes

stronger, the scope that cooperatives with member CEOs being efficient becomes larger. Yet when the effect of the substitution effect between the two tasks is small or large, the scope that cooperatives with member CEOs being efficient is relatively large.

Chapter 5: Pooling, Quality Provision, and the Yardstick Effect of Cooperatives

Abstract

Most agricultural markets show differentiated products and coexistence of cooperatives and investor-owned firms (IOFs). Some markets have low quality products provided by cooperatives, whereas other markets have high quality product provided by cooperatives. This paper investigates the relationship between product quality and governance structure. We show in a non-cooperative game between farmers and enterprises that governance structure choices of farmers producing differentiated products depend crucially on the differential treatment of members regarding quality within a cooperative. The presence of cooperatives in a market has a competitive yardstick effect. Both the market share of cooperatives and the extent of payment differentiation inside a cooperative have a positive effect on the prices received by farmers.

5.1 Introduction

The changing production methods, increased concentration in supply chains, lower world prices and more international markets are threatening to small farmers (Hazell et al. 2006). Helper (1991) indicates that buyer-supplier relationships are becoming more dependent on factors such as quality, delivery performance, flexibility in contracting, and commitment to work together, as opposed to traditional relationships based on cost. Nowadays food quality and safety have become so important that suppliers have to pay more attention to them, as well as to consumers' preferences. Given the substantial heterogeneity among consumers, there are opportunities for farmers to produce differentiated products. Farmers are potentially able to grasp these opportunities because they are heterogeneous regarding educational level, experience, geographic location, market orientation, farm size, production technique, quality, risk attitude, age, non-farm incomes, etc. (Iliopoulos and Cook, 1999; Zusman, 1992). However, the rise of supermarkets and the subsequent specialized distribution centers is a challenge to small farmers (Hu and Reardon, 2004). They can hardly deal with the private standards of these modern transaction parties, nor do they have the countervailing power to gain a reasonable share of the value added. Uncoordinated private action may result in market failure. Zusman and Rausser (1994) argue that collective action via cooperatives may resolve this in efficiency.

The market and the firm are two alternative governance structures through which transactions occur (Coase, 1937). Other governance structures observed in agri-food production and marketing are contracts, contract farming, cooperatives, franchises, and networks. Governance structure is defined as the allocation of decision rights and income rights over relevant assets (Hansmann, 1996). Decision rights in the form of authority and responsibility address the question 'Who has authority or control (regarding the use of assets)?', while income rights address the question 'How are benefits and costs allocated?'. The main distinction between an investor-owned firm (IOF) and a cooperative is that the decision rights reside formally with the investors in an IOF and with the input suppliers or buyers in an agricultural cooperative. The focus in this article is on the outlet choice of farmers for their produce, where the outlet choice is either an IOF or a cooperative. Different income rights structures are considered for the cooperative by distinguishing various degrees of pooling.

An important feature of cooperatives is the equal treatment of their owners / members (Nilsson, 1998). It entails that the allocation of revenues as well as costs may be (partially) independent of quality and/or quantity. This practice of pooling is commonly believed to place cooperatives at a competitive disadvantage in quality differentiated markets. Fulton and Sanderson (2002) argue that traditional cooperatives have disadvantages in meeting markets' demands for quality, due to several reasons. Firstly, revenue pooling generates adverse selection problems among heterogeneous farmers. Secondly, patronage-based financing leads to the horizon problem and underinvestment in long-term strategies that can enhance objective or perceived product quality. Thirdly, providing a "home" for member production is problematic both with respect to product quality and the potential to glut niche market. Finally, difficulties in dealing with "marginal" members lead to revenue inefficiencies of each member. However, pooling can also bring advantages (Saitone and Sexton, 2009, Hendrikse, 2011). It attenuates the incentive of farmers to overproduce high quality products, insures risk-averse farmers against stochastic variation in quality levels, and creates countervailing power.

Cooperatives may experience adverse selection due to a heterogeneous membership, which has an effect on the level of quality provided by cooperatives. Hart and Moore (1996) stress the member-control characteristic of cooperatives and consider the relationship between a heterogeneous membership and the choice of governance structure. A cooperative becomes relatively less efficient than an outside exchange when the variation across the membership becomes more skewed and as the transaction faces more competition. Zago (1999) highlights the rights to vote for the payment scheme. The payment scheme chosen by members reflects the preferences of the majority of farmers, which entails adverse selection of the minority. Irrespective of the remuneration scheme adopted for quality, a differentiation mechanism or a pooling mechanism, the quality level provided by the cooperative is higher than the first-best when high quality members are the majority and lower when low quality

members are majority. Some constitutional rule is needed to avoid adverse selection of the minority and enhance total welfare. Hoffmann (2005) examines the quality provision of firms with different ownership structures. Cooperatives and IOFs have different objective functions and face different costs. The IOF maximizes the profit from processing, while the cooperative maximizes the joint profits of members. The results show that the cost of quality has an impact on the choice of quality levels and on total welfare. When there is a fixed cost of quality at the primary level, IOFs generate a larger consumer surplus and produce higher qualities, while cooperatives generate a larger producer surplus. When there is a variable cost of quality at the primary level, a cooperative produces higher quality and generates larger profits, larger consumer surplus, and larger social welfare. However, ownership structures themselves are not able to realize the highest total welfare. The government therefore may help to adjust the market structure and quality levels by, for example, promoting a certain ownership structure. Cooperatives may also use an appropriate payment scheme to motivate heterogeneous members to join and stay with the cooperative. The bylaws of cooperatives have the flexibility to design an income rights structure which tailors to the heterogeneity of the membership. Some cooperatives move towards high quality provision due to an incentive payment scheme paying for quality, but the opposite occurs as well (Hendrikse, 2011).

The evidence regarding the relationship between governance structure and product quality in agricultural markets is mixed. Some markets have low quality products provided by cooperatives, whereas other markets have high quality provided by cooperatives. There are many cooperatives providing low quality products. Most wine cooperatives in Germany and in Spain are characterized by low quality due to the defense-oriented characteristics of traditional cooperatives (Frick, 2004; Theodorakopoulou and Iliopoulos, 2012). One example is that the income rights are based on patronage without incentives for quality. Pennerstorfer and Weiss (2012) report low quality of wine by cooperatives in Austria. Because members of cooperatives do not receive the full benefits of the investment in quality, and they tend to deliver low quality products due to the free-riding problem, there are many low quality wine cooperative in Italy (Bijman et al., 2012). However, there are also a few high quality wine cooperatives in Italy, like Terlan cooperative, Tramin cooperative, and Bozen cooperative. Other examples of cooperatives supplying high quality products are dairy cooperative FrieslandCampina and cheese cooperative De Producent in the Netherlands, most Tingo Maria coffee and cacao cooperatives in Peru, Jiaxing grape cooperative in Zhejiang, China, Hanguang fruit and vegetable cooperative in Taiwan, and broiler cooperatives in Brazil (Cechin, et al., 2012). It is also noteworthy that cooperatives in China have become the main adopters of food quality standards and they provide higher quality than individual farmers (Zhou and Jin, 2009). The cooperatives delivering high quality products are characterized by quality premiums.

The presence of farmer cooperatives in the market helps to avoid market failure due to the competitive yardstick effect. The competitive yardstick effect refers to the fact that the presence of cooperatives in the market forces investor-owned firms to offer higher procurement prices for farmers' products. Empirical support for the competitive yardstick is observed in the food manufacturing industry in the US (Rogers and Petraglia, 1994), the wheat market in Canada (Zhang et al., 2007), the coffee market in Chiapas, Mexico (Milford, 2012), and the European dairy industry (Hanisch et al., 2012). Helmberger (1964), Cotterill (1987), and Milford (2012) establish a competitive yardstick effect in his homogeneous product models, Sexton (1990) and Tribl (2009) show this effect in spatial models. The driving force behind the competitive yardstick effect in these models is the elimination of the double mark-up and the service-at-cost principle of cooperatives, i.e. the vertical integration feature of the cooperative eliminates a mark-up by an intermediary or an IOF processor and the zero profit feature of the cooperative is established by paying the profits of the cooperative to members by a higher transfer price. Hendrikse (2007a) establishes a competitive yardstick effect in a model with production uncertainty by a contracting externality. Production uncertainty entails that an upstream party does not produce with a certain probability. In equilibrium high reservation demand is met by cooperatives, while low reservation demand is procured in the spot market. An additional cooperative takes additional high reservation demand out of the spot market, which has a decreasing effect on the expected spot market price. However, additional formation of cooperatives entails also additional residual demand in the spot market due to the production uncertainty, which has an increasing effect on the expected spot market price. Contract and spot market prices are positively related to the percentage of cooperatives in the market due to the second effect dominating the first effect.

This article addresses the relationship between the sorting of heterogeneous members and the income rights structure of a cooperative in terms of the extent of pooling. It addresses the provision of product quality by different governance structures. Heterogeneous farmers in terms of product quality choose either an IOF or a cooperative. An IOF prices products differentially and earns the difference between input prices and output prices, while a cooperative adopts either a pooling or differential pricing policy and distributes all revenues to members. Farmers with low (high) quality products deliver to the cooperative when it adopts a complete pooling (quality premiums) price policy. The commitment of the cooperative to a (partial) pooling price policy is responsible for the competitive yardstick effect. It forces the IOF to increase procurement prices in order to attract farmers when it competes with a cooperative. Not only farmers delivering to the cooperative receive a higher surplus, but also the other farmers receive more compared to the IOF market. The competitive yardstick effect of cooperatives is therefore a public good (Staatz, 1984).

This article addresses the relationship between the sorting of heterogeneous members and the income rights structure of a cooperative in terms of the extent of pooling. It addresses the provision of product quality by different governance structures. Heterogeneous farmers in terms of product quality choose either an IOF or a cooperative, and how alternative payment schemes influence the competitive yardstick effect of the cooperative. An IOF prices products differentially and earns the difference between input prices and output prices, while a cooperative adopts either a pooling or differential pricing policy and distributes all revenues to members. Farmers with low (high) quality products deliver to the cooperative when it adopts a complete pooling (quality premiums) price policy. The commitment of the cooperative to a (partial) pooling price policy is responsible for the competitive yardstick effect because it forces the IOF to increase procurement prices in order to attract farmers when it competes with a cooperative. Not only farmers delivering to the cooperative receive a higher surplus, but also the other farmers receive more compared to the IOF market. The competitive yardstick effect of cooperatives is therefore a public goods (Staatz, 1984).

This article is organized as follows. Section 5.2 specifies the game between farmers and enterprises. Section 5.3 determines the equilibrium. We extend the model by including differential payments regarding quality within cooperatives in section 5.4. We summarize and conclude with some possibilities for future research in section 5.5.

5.2 Model

This section develops a non-cooperative game highlighting the farmers' choices of product outlet, and the pricing policies of the enterprises. The five ingredients of the game, i.e. players, choices, payoffs, information structure, and rules of the game, are specified in this section.

Players

Assume that there are three farmers, two enterprises, and three consumers. Farmer 1 (2, 3) produces low (median, high) quality product. The two enterprises act as marketing organizations that purchase products from farmers and sell to consumers.

Choices

An enterprise e (= 1, 2) chooses between two governance structures, investor-owned firm (IOF) and open-membership cooperative. An IOF chooses a differentiated markup pricing policy, whereas a cooperative chooses a pooling price policy. Each enterprise having two governance structure possibilities implies that there are three possible compositions of the market, i.e. two IOFs, an IOF and a cooperative, and two cooperatives. An open-membership cooperative entails that farmers can

join in the cooperative without limitation or any cost. An IOF can reject farmers to deliver to it, whereas a cooperative can't.

A farmer chooses where to deliver and each farmer produces either nothing or one unit of product. Let q_j^{eg} be the delivery and output choice of farmer j ($= 1, 2, 3$) to enterprise e ($= 1, 2$) with governance structure g ($= I, C$), where I (C) is an IOF (a cooperative). $q_j^{eg} = 0$ if farmer j does not produce a unit of product. $q_j^{eg} = 1(0)$ when farmer j delivers (does not deliver) to enterprise e with governance structure g. Consumer 1 (2, 3) buys either nothing or one unit of product.

Payoffs

IOFs and cooperatives are characterized by different payment schemes. The main distinction of payments between an IOF and a cooperative lies in the pricing policy and the distribution of income. An IOF prices products on the basis of quality when purchasing inputs from farmers. It earns the difference between the input price and the sales price. A cooperative pools inputs of differentiated qualities and pays farmers a pooling price. It distributes all revenues to members. Both an IOF and a cooperative price products discriminatorily when selling products in the final product market, depending on the quality of products. The pricing policy of the IOF is known as double markup or double marginalization (Spengler, 1950), where markup refers to the difference between the price and the marginal cost in each stage of production (Carlton and Perloff, 1990: p526).[32]

Define R_j as the reservation price of a consumer for product j. Consumers attach value to quality, i.e. $R_1 < R_2 < R_3$. The production costs of product j by farmer j are c_j ($j = 1, 2, 3$), where c_j is increasing in j. Production costs are zero when the farmer does not produce. Reservation prices are assumed to be larger than the production cost, i.e. $c_j < R_j$ for $j = 1, 2, 3$.

Enterprises earn the difference between the purchasing price and the sales price. Let p_{jb}^{eg} be the procurement price that enterprise e with governance structure g pays when buying (b) product j and p_{js}^{eg} be the sales price that enterprise e with governance structure g receives for selling (s) product j to a consumer. Notice that the two markups of the IOF are therefore $p_{jb}^{eI} - c_j$ and $p_{js}^{eI} - p_{jb}^{eI}$. A cooperative has only a single markup.

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[32] In a supply chain comprised of farmers, IOFs, and consumers, there are two markups. One occurs when an IOF purchases an input from a farmer, implying the procurement price being higher than the production cost of the product. The other markup occurs when a consumer buys the product with a sales price which is higher than the processing price. This double markup provides an incentive for vertical integration. A cooperative eliminates the markup between producers and processors to zero through vertical integration, i.e. a cooperative serves members at cost.

Enterprise e with governance structure g earns $\sum_{j=1}^{3} q_j^{eg} p_{js}^{eg} - \sum_{j=1}^{3} q_j^{eg} p_{jb}^{eg}$, where $\sum_{j=1}^{3} q_j^{eg} p_{js}^{eg}$ is the total revenue that enterprise e with governance structure g earns and $\sum_{j=1}^{3} q_j^{eg} p_{jb}^{eg}$ refers to what enterprise e with governance structure g pays to farmers. The revenue of farmer j is p_{jb}^{eg} when he delivers to enterprise e with governance structure g and zero if he does not produce. Assume that members of a cooperative shoulder production costs individually. Farmer j earns $\sum_e \sum_g q_j^{eg} (p_{jb}^{eg} - c_j)$.

Denote the payoff of enterprise e with governance structure α, competing with an enterprise with governance structure β, as $\pi_e^{\alpha\beta}$. Define the payoff of farmer j in an enterprise with governance structure α competing with an enterprise with governance structure β as $F_j^{\alpha\beta}$.

Information structure

Product quality, product production cost, consumers' reservation prices, and the enterprises' pricing policy and income rights distribution strategy are common knowledge.

Sequence of decisions

The game consists of four stages. At stage one, each enterprise chooses its governance structure to be an IOF or a cooperative, and therefore its price policy. Governance structure choices are made simultaneously.[33] At stage two, farmers choose the outlet of their products. The three farmers act simultaneously. At stage three, farmers decide about their level of output, i.e. to produce one unit of product or not to produce. Consumers decide to buy or not to buy one unit in the final stage.

5.3 Equilibrium

The game will be solved by the method of backward induction. Consumers will buy in the final stage of the game when the price of the product is not higher than the reservation price. Next, farmers' production decisions and product outlet choices are considered, given the governance structure choices in the first stage of the game. Finally, the price of each product in each governance structure is determined, anticipating the choices of farmers, and governance structures are chosen. Section 5.3.1 presents the production and outlet choices. The equilibrium governance structure choices in the first stage of the game are presented in 5.3.2.

5.3.1 Production and outlet choices

The production and outlet choices are determined based on the choice of governance structure in the first stage of the game. Three cases have to be distinguished, i.e. an IOF market (5.3.1.1), a mixed duopoly market (5.3.1.2), and a cooperative market (5.3.1.3). The relationship between the price paid

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[33] The equilibrium results when the two enterprises move sequentially are the same with that when the two enterprises move simultaneously. We therefore only present the case when the two enterprises move simultaneously.

to farmers and the market share of cooperatives, i.e. the competitive yardstick effect, is determined in section 5.3.1.4.

5.3.1.1 IOF market

Suppose that there are two IOFs in the market and that they decide prices simultaneously. Since producers are assumed to know the preferences of each consumer, all the consumer surpluses will be extracted away by the enterprises (Grossman, 1981). Prices that the IOFs charge consumers are $p_{js}^{eI} = R_j$. There is price competition between the two IOFs to attract farmers. One IOF would always try to choose an input price for each product which is a little bit higher than that of the other IOF as long as it earns a non-negative payoff. Input prices of the two IOFs tend to $p_{jb}^{eI} = R_j - \varepsilon$, where ε is a small positive number. Both IOFs will hardly have any profit. If there is a positive sunk cost for entering the market (Sutton, 1991), then there will be a monopolistic market due to the IOFs anticipating the consequences of a contestable market. Assume that enterprise 1 is the monopolist. The monopolist will maximize its payoff by pricing inputs at marginal costs, i.e. $p_{jb}^{1I} = c_j + \varepsilon$, and selling the outputs at $p_{js}^{1I} = R_j$. Equilibrium price policies, outlet choices, and production decisions in the IOF market are presented in table 5.1.

Table 5.1 Equilibrium in the IOF market

j	p_{jb}^{1I}	p_{js}^{1I}	q_j^{1I}	q_j^{2I}
1	$c_1 + \varepsilon$	R_1	1	0
2	$c_2 + \varepsilon$	R_2	1	0
3	$c_3 + \varepsilon$	R_3	1	0

Revenues of the market participants are presented in table 5.2. The payoff of the IOF is $\pi^I = \sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_j - 3\varepsilon$ and each farmer earns ε.

Table 5.2 Payoffs in the IOF market

	Payoffs
Enterprise	$\pi_1^{II} = \sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_1 - 3\varepsilon$
	$\pi_2^{II} = 0$
Farmers	$F_1^{II} = \varepsilon$
	$F_2^{II} = \varepsilon$
	$F_3^{II} = \varepsilon$
Total surplus	$\sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_j$

Proposition 1: *All farmers deliver to one IOF and earn almost nothing in a market with only IOFs.*

5.3.1.2 Mixed duopoly

A cooperative distributes its revenues equally among its producer members. It entails that a cooperative has zero profits. Farmer j delivering to the cooperative therefore earns

$$p_{jb}^{eC} = \frac{\sum_{j=1}^{3} q_j^{eC} p_{js}^{eC}}{\sum_{j=1}^{3} q_j^{eC}}.$$

There are two markups for product j ($j = 1, 2, 3$) delivered by the IOF. One markup arises when the IOF buys from farmer j. The other markup arises when the IOF sells product j to a consumer. Thus the IOF chooses two sets of prices, i.e. the procurement prices and the sales prices. The IOF earns the difference between the procurement price and the sales price.

Equilibrium price policies, outlet choices, and production decisions are presented in table 5.3. The cooperative is not able to attract high quality farmers due to the collective pooling price. The IOF tailors its pricing policy to individual farmers. The IOF chooses a procurement price which is a little lower than the reservation price, $p_{jb}^{1I} = R_1 - \varepsilon$, to deter farmer 1 from delivering to the IOF. If the IOF chooses $p_{jb}^{1I} = R_1$, then farmer 1 is indifferent in delivering to the IOF and the cooperative. The IOF sequentially has to choose $p_{2b}^{1I} = R_2$ and $p_{3b}^{1I} = R_3$ in order to attract farmer 2 and farmer 3 when $p_{jb}^{1I} = R_1$. The IOF therefore chooses a lower procurement price for the low quality product in order to establish lower opportunity costs for farmer 2 and farmer 3. The IOF chooses $p_{jb}^{1I} = R_1 - \varepsilon$. It chooses $p_{2b}^{1I} = \frac{R_1 + R_2}{2} + \varepsilon$ in order to prevent that farmer 2 goes to the cooperative. It chooses $p_{3b}^{1I} = \frac{R_1 + R_3}{2} + \varepsilon$ to prevent that farmer 3 goes to the cooperative. Farmer 1 delivers to the cooperative. The

pooling price policy of the cooperative causes adverse selection of farmer 2 and farmer 3. They choose to deliver to the IOF. Each farmer produces one unit of product.

Table 5.3 Equilibrium in the mixed duopoly

j	p_{jb}^{1I}	p_{js}^{1I}	p_b^{2C}	p_s^{2C}	q_j^{1I}	q_j^{2C}
1	$R_1 - \varepsilon$	R_1	R_1	R_1	0	1
2	$\frac{R_1+R_2}{2} + \varepsilon$	R_2	R_1	R_2	1	0
3	$\frac{R_1+R_3}{2} + \varepsilon$	R_3	R_1	R_3	1	0

Payoffs of the players are presented in table 5.4. Farmer 1 earns $R_1 - c_1$ by delivering to the cooperative. Farmer 2 receives $\frac{R_1+R_2}{2} + \varepsilon$ from the IOF and earns $\frac{R_1+R_2}{2} - c_2 + \varepsilon$. The IOF earns $\frac{R_2-R_1}{2} - \varepsilon$ from the marketing of the medium quality product. Farmer 3 receives $\frac{R_1+R_3}{2} + \varepsilon$ from the IOF and earns $\frac{R_1+R_3}{2} - c_3 + \varepsilon$. The IOF earns $\frac{R_3-R_1}{2} - \varepsilon$ from the marketing of the high quality product. All farmers earn more in the mixed duopoly than in the IOF market.

Table 5.4 Payoffs in the mixed duopoly

	Payoffs
Enterprises	$\pi_1^{IC} = \frac{R_3+R_2-2R_1}{2} - 2\varepsilon$
	$\pi_2^{CI} = 0$
Farmers	$F_1^{CI} = R_1 - c_1$
	$F_2^{IC} = \frac{R_1+R_2}{2} - c_2 + \varepsilon$
	$F_3^{IC} = \frac{R_1+R_3}{2} - c_3 + \varepsilon$
Total surplus	$\sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_j$

Proposition 2 states that the pooling function of a cooperative discourages farmers with high quality products from joining the cooperative. It entails adverse selection, which is a widely recognized problem regarding cooperatives (Fulton and Sanderson, 2002; Saitone and Sexton, 2009). Farmers providing low quality products are willing to deliver to the cooperative because they benefit from the elimination of the double markup. The IOF is in the high reservation price market niches.

Proposition 2. *The low quality farmer delivers to the cooperative whereas the farmers producing medium and high quality products deliver to the IOF.*

5.3.1.3 Cooperative market

Cooperatives are characterized by a price policy based on pooling. There is no Nash equilibrium in pure strategies in a market with only cooperatives. Low quality farmers like to deliver to the cooperative where high quality farmers deliver, in order to benefit from pooling. However, high quality farmers leave the cooperative where low quality farmers deliver and join the other cooperative. The choices of farmers therefore result in a mixed strategy equilibrium. Suppose that parameter values are such that all three farmers produce one unit of product. The equilibrium mixed strategy of each farmer is to choose enterprise 1(2) with probability 0.5(0.5). The equilibrium payoffs are presented in table 5.5.

Table 5.5 Payoffs in the cooperative market

	Payoffs of each player
Enterprises	$\pi_1^{CC} = 0$
	$\pi_2^{CC} = 0$
Farmers	$F_1^{CC} = \frac{14R_1 + 5R_2 + 5R_3}{24} - c_1$
	$F_2^{CC} = \frac{5R_1 + 14R_2 + 5R_3}{24} - c_2$
	$F_3^{CC} = \frac{5R_1 + 5R_2 + 14R_3}{24} - c_3$
Total surplus	$\sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_j$

All farmers produce one unit of product when $\frac{R_1+R_2}{2} > c_2$, $\frac{R_1+R_2+R_3}{3} > c_3$, and $\frac{R_1+R_3}{2} > c_3$. The equilibrium mixed strategy changes when at least one farmer does not produce. Farmer 2 will not produce when $\frac{R_1+R_2}{2} < c_2$, while farmer 3 will not produce when $\frac{R_1+R_2+R_3}{3} < c_3$ or $\frac{R_1+R_3}{2} < c_3$. The equilibrium mixed strategy of each farmer is to choose enterprise 1(2) with probability 0.5(0.5) and choose to produce when his expected payoff is positive while not produce otherwise. It is therefore not efficient when a farmer does not produce.

5.3.1.4 Yardstick effect

All the three markets are efficient regarding total welfare when all farmers produce. However, equilibrium farmer payoffs differ substantially between markets. Table 5.6 summarizes the price

received by each farmer in each market. Denote the equilibrium input price for product j in market structure k to be p_j^k, where $k = I, M, C$ with I referring to the IOF market, M to the mixed duopoly, and C to the cooperative market.

Table 5.6 Market structure and input prices

	IOF market	Mixed duopoly	Cooperative market
Farmer 1	$p_1^I = \varepsilon$	$p_1^M = R_1$	$p_1^C = \frac{14R_1 + 5R_2 + 5R_3}{24}$
Farmer 2	$p_2^I = \varepsilon$	$p_2^M = \frac{R_1 + R_2}{2} + \varepsilon$	$p_2^C = \frac{5R_1 + 14R_2 + 5R_3}{24}$
Farmer 3	$p_3^I = \varepsilon$	$p_3^M = \frac{R_1 + R_3}{2} + \varepsilon$	$p_3^C = \frac{5R_1 + 5R_2 + 14R_3}{24}$

In the IOF market all the farmers deliver to one IOF. The IOF prices inputs at marginal costs. Each farmer earns a small profit. In the mixed duopoly market, the pooling policy of the cooperative results in adverse selection. Only farmers producing the lowest quality products deliver to the cooperative, whereas the other farmers deliver to the IOF. However, the prices received by farmers are much higher. The commitment of the cooperative to a pooling price policy forces the IOF to pay higher prices to farmers. In the cooperative market, there is a mixed strategy equilibrium. Farmers are indifferent in choosing either cooperative.

Define the yardstick effect as the difference between procurement price paid to farmers in the market when cooperatives are present and the price when there is no cooperative. Denote the size of the yardstick effect to be δ_j^k for product j in the market structure k. We obtain $\delta_1^M = R_1 - \varepsilon$, $\delta_2^M = \frac{R_1 + R_2}{2}$, and $\delta_3^M = \frac{R_1 + R_3}{2}$. The presence of a cooperative in the mixed duopoly has a comparative yardstick effect. Not only farmers delivering to the cooperative are better off, but also farmers delivering to the IOF earn more revenues than those in a pure IOF market.

The sizes of the yardstick effect in the cooperative market are $\delta_1^C = \frac{14R_1 + 5R_2 + 5R_3}{24} - \varepsilon$, $\delta_2^C = \frac{5R_1 + 14R_2 + 5R_3}{24} - \varepsilon$, and $\delta_3^C = \frac{5R_1 + 5R_2 + 14R_3}{24} - \varepsilon$. Let $\Delta\delta_j$ be the difference in the yardstick effect of product j between the cooperative market and the mixed duopoly. Then $\Delta\delta_1 = \frac{5R_2 + 5R_3 - 10R_1}{24} > 0$, $\Delta\delta_2 = \frac{2R_2 + 5R_3 - 7R_1}{24} - \varepsilon > 0$, and $\Delta\delta_3 = \frac{2R_3 + 5R_2 - 7R_1}{24} - \varepsilon > 0$. All the farmers are better off in the cooperative market than the mixed market. The yardstick effect of each product in the cooperative market is stronger than that in the mixed duopoly. This result is summarized in proposition 3.

Proposition 3. *The presence of cooperatives in the market has a yardstick effect and the effect gets stronger as the market share of cooperatives increases.*

Procurement prices in both the mixed duopoly and the cooperative market are higher than in the IOF market. If cooperatives provide better prices to farmers than IOFs do, IOFs would lose market share to cooperatives. Due to the cooperatives' pooling price policy, IOFs also have to pay a pooling price. When the market shares of the cooperative increase from one third (only the low quality farmer delivers to the cooperative) to one, the size of the yardstick effect for each product becomes larger. Given farmers' heterogeneity, the more farmers join the cooperative, the smaller market niche the IOF has. It therefore has to pay higher prices to compete for market share. The yardstick effect of each product for various market shares of the cooperative(s), ranging from zero, to one third, to one, is presented in figure 5.1.
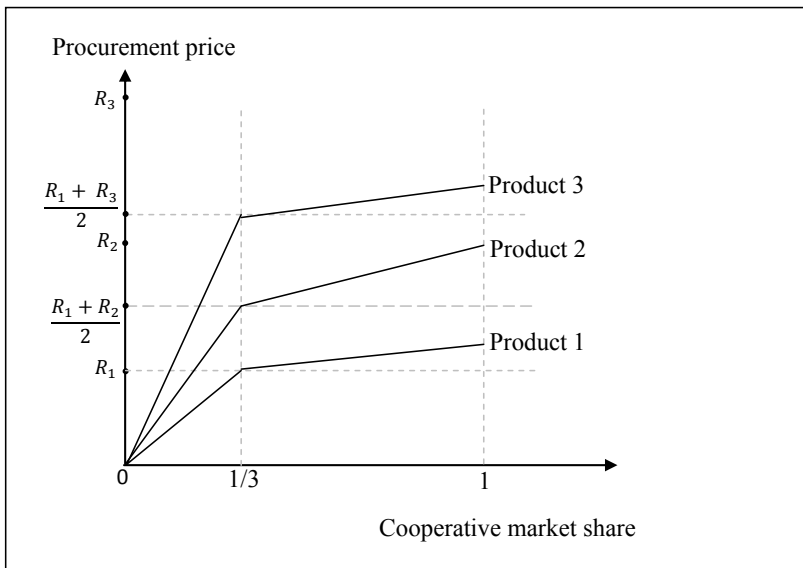
Figure 5.1 Yardstick effect

The competition between established firms and potential entrants is similar to the practice of limit pricing. Limit pricing entails setting a high output level, or a low price, to deter new firms from entering industries (Milgrom and Roberts, 1982; Sexton and Sexton, 1987). The potential entrants expect existing firms to maintain their pre-entry output or price after entry. This makes it less attractive for potential firms to enter the market. Our model shows the reverse effect in an intermediate product market. The presence of cooperatives in the market increases the price(s) at

which farmers are able to sell their products. The yardstick effect of cooperatives is to increase the procurement prices paid to farmers. The next section determines the equilibrium industry structure.

5.3.2 Governance structure choice

Equilibrium results of farmer and enterprise payoffs in alternative markets are presented in table 5.7. In each cell of the table, a vector $\left(\left[\left(F_1^{\alpha\beta}, F_2^{\alpha\beta}, F_3^{\alpha\beta}\right); \pi_1^{\alpha\beta}\right], \left[\left(F_1^{\beta\alpha}, F_2^{\beta\alpha}, F_3^{\beta\alpha}\right); \pi_2^{\beta\alpha}\right]\right)$ is listed. It reflects the payoff of farmer j in enterprise e with governance structure α facing competition of an enterprise with governance structure β, as well as the payoff of the enterprises.

In an IOF duopoly, the IOF prices inputs at marginal costs of production. Farmers therefore receive hardly any payoff. They will respond by starting a cooperative. A mixed IOF-cooperative duopoly market is also not stable. In the mixed duopoly market, the pooling policy of the cooperative leads to adverse selection. Only farmers producing the lowest quality level products deliver to the cooperative, whereas higher quality farmers deliver to the IOF. The presence of a cooperative has a competitive yardstick effect. Not only farmers delivering to the cooperative are better off, but also farmers delivering to the IOF earn more revenues than those in the IOF market. The IOF earns a positive payoff due to the double markup. Farmers earn even more when they leave the IOF and start a second cooperative. A cooperative market is the equilibrium industry composition. All the value-added product is obtained by farmers.

Table 5.7 Market structure and farmer payoffs

$e = 2$ / $e = 1$	IOF	Coop
IOF	$\left(\left[(\varepsilon,\varepsilon,\varepsilon); \sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_1 - 3\varepsilon\right],\right.$ $\left.[(0,0,0); 0]\right)$	$\left(\left[\left(0, \frac{R_1+R_2}{2} - c_2 + \varepsilon, \frac{R_1+R_3}{2} - c_3 + \varepsilon\right); \frac{R_3+R_2-2R_1}{2} - 2\varepsilon\right],\right.$ $\left.[(R_1-c_1,0,0); 0]\right)$
Coop	$\left(\left[(R_1-c_1,0,0); 0\right],\right.$ $\left.\left[\left(0, \frac{R_1+R_2}{2} - c_2 + \varepsilon, \frac{R_1+R_3}{2} - c_3 + \varepsilon\right); \frac{R_3+R_2-2R_1}{2} - 2\varepsilon\right]\right)$	$\left(\left[\left(\frac{14R_1+5R_2+5R_3}{24} - c_1, \frac{5R_1+14R_2+5R_3}{24} - c_2, \frac{5R_1+5R_2+14R_3}{24} - c_3\right); 0\right],\right.$ $\left.\left[\left(\frac{14R_1+5R_2+5R_3}{24} - c_1, \frac{5R_1+14R_2+5R_3}{24} - c_2, \frac{5R_1+5R_2+14R_3}{24} - c_3\right); 0\right]\right)$

5.4 Partial pooling

Although equal distribution of revenues in terms of quality used to be the basic principle of cooperatives, many cooperatives nowadays choose alternative payment schemes due to changed market conditions. Differential pricing is important for a cooperative's stability and optimal production decisions when member heterogeneity is increasing (Sexton, 1986; Staatz, 1984). Take for example the Dutch cooperative Coforta (Hendrikse, 2011). High quality members left the cooperative due to the pooling strategy. However, high quality farmers returned to the cooperative when policies were more tailored to the high quality members. Other examples are provided in the introduction

section. Many cooperatives therefore grade members' products and pay differential prices based on quality. We therefore extend the model by relaxing the assumption of complete pooling. The interactions between farmers' outlet choice and partial pooling based on sales price (5.4.1) and partial pooling based on sales price and quality premium (5.4.2) are examined.

5.4.1 Partial pooling based on sales price

Define the payment differentiation parameter θ as the extent of differentiation regarding the distribution of revenues in terms of sales prices. $\theta = 0$ entails complete pooling, or the equality principle regarding the distribution of revenues, while $\theta = 1$ entails no pooling, or distribution of revenues based entirely on sales prices. Suppose farmer j delivering to a cooperative receives a payment comprised of the pooling price and a differential price based on the sales price, i.e.

$$p_{jb}^{ec} = (1 - \theta)\frac{\sum_{j=1}^{3} p_{js}^{ec} q_j^{ec}}{\sum_{j=1}^{3} q_j^{ec}} + \theta p_{js}^{ec}.$$

Consider firstly the mixed duopoly market. When $0 \leq \theta < 1$, the outlet choices of farmers and the governance structure choices are the same as in the case of complete pooling. Farmer 1 delivers to the cooperative, whereas farmer 2 and farmer 3 deliver to the IOF. Though the payment differentiation regarding quality in the cooperative offers an incentive to farmer 2 and farmer 3 to join the cooperative, the IOF is able to attract farmer 2 and farmer 3 by increasing the procurement price. The procurement prices that various farmers receive are $p_1^M = R_1$, $p_2^M = (1 - \theta)\frac{R_1 + R_2}{2} + \theta R_2 + \varepsilon$, and $p_3^M = (1 - \theta)\frac{R_1 + R_3}{2} + \theta R_3 + \varepsilon$. As θ increases, the IOF facing competition from the cooperative has to increase the procurement prices to attract farmers. The procurement prices paid to medium and high quality farmers therefore increase as well. When $\theta = 1$, the prices paid by the cooperative are $p_1^M = R_1$, $p_2^M = R_2$, and $p_3^M = R_3$. The IOF will earn nothing if it pays farmers the same prices as the cooperative does. It therefore is not able to attract farmers. All the farmers deliver to the cooperative rather than the IOF in the mixed duopoly market.

Assume that the equilibrium θ is determined by majority voting of the membership of the cooperative. Farmer 3 prefers a high differentiation parameter and votes for $\theta = 1$. Farmer 2 is aware that farmer 3 delivers to the cooperative only when $\theta = 1$. He would then choose $\theta = 1$ to escape from the pooling with low quality farmer. Farmer 1 is indifferent in any value of θ, because he realizes that neither farmer 3 nor farmer 2 will deliver to the cooperative when θ is smaller than 1. The equilibrium in the mixed duopoly is that the cooperative sets $\theta = 1$ and all farmers join the cooperative. Each farmer earns the sales price of his product.

Although partial pooling based on sales price does not result in different outlet choices of farmers, it affects the yardstick effect of the cooperative. The procurement prices for both farmer 2 and farmer 3 delivering to the IOF increase as the price differentiation parameter θ increases. There are more incentives for high quality farmers to join the cooperative when θ increases. As the differentiation in the cooperative' pricing policy for differentiated qualities increases, the procurement prices that the IOF has to pay to farmer 2 and farmer 3 are increasing as well in order to prevent them from leaving. This drives the procurement price in the markets towards the sales prices. The yardstick effect therefore increases. All the farmers deliver to the cooperative. This result is summarized in proposition 4 and depicted in figure 5.2. When the cooperative adopts complete differentiation, i.e. $\theta = 1$, the IOF is not able to compete in any market niche any more.

Proposition 4. *There is a positive relationship between the degree of payment differentiation regarding product quality within a cooperative and the yardstick effect.*
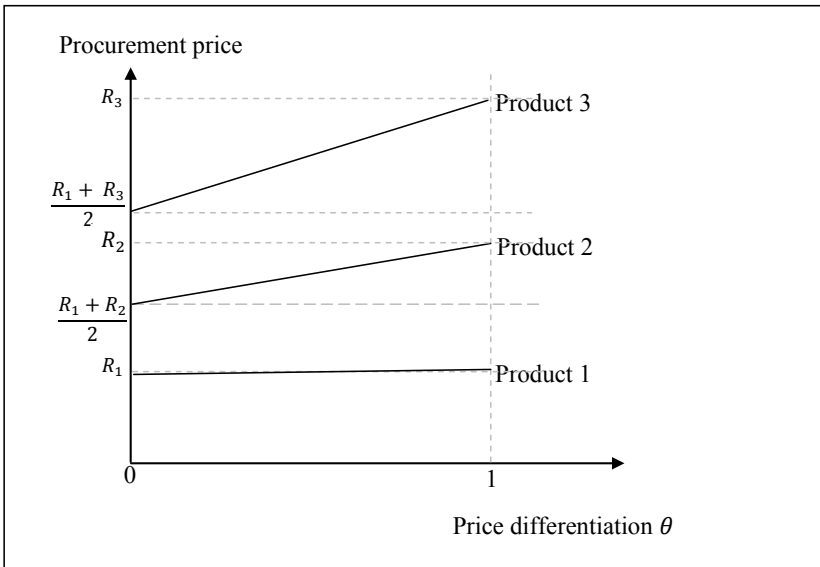
Figure 5.2 Yardstick effect when partial pooling is based on sales price

In the cooperative market, farmers' outlet choices are dependent on the degree of differentiation of the two cooperatives. Assume that the two cooperatives are identical regarding θ. There is a no Nash equilibrium in pure strategies. Farmer chooses cooperative 1(2) with probability 0.5(0.5). Farmer j

earns $\dfrac{5\theta(3R_j - \sum_{j=1}^{3} R_j)}{24} + \dfrac{9R_j + 5\sum_{j=1}^{3} R_j}{24}$.

Consider again the choice of θ by the membership. Farmer 3 votes for $\theta = 1$, while farmer 1 will vote for $\theta = 0$. Farmer 2's choice regarding θ depends on the value of R_2 and $\frac{R_1 + R_3}{2}$. If $R_2 > \frac{R_1 + R_3}{2}$, farmer 2 votes for $\theta = 1$. Otherwise farmer 2 votes for $\theta = 0$. When $R_2 > \frac{R_1 + R_3}{2}$, cooperatives choose $\theta = 1$ and each farmer receives a price equal to the sales price of his product. When $R_2 < \frac{R_1 + R_3}{2}$, cooperatives set $\theta = 0$ and the expected price, due to the mixed strategy equilibrium, of farmer 1 (2, 3) is $\frac{14R_1 + 5R_2 + 5R_3}{24}$ $\left(\frac{5R_1 + 14R_2 + 5R_3}{24}, \frac{5R_1 + 5R_2 + 14R_3}{24}\right)$.

In the IOF market all the farmers deliver to one IOF. The IOF prices inputs at marginal costs. Each farmer earns a small profit.

Equilibrium farmer payoffs in different markets when $R_2 > \frac{R_1 + R_3}{2}$ are summarized in table 5.8. In each cell of the table, a vector $\left(\left[\left(F_1^{\alpha\beta}, F_2^{\alpha\beta}, F_3^{\alpha\beta}\right); \pi_1^{\alpha\beta}\right], \left[\left(F_1^{\beta\alpha}, F_2^{\beta\alpha}, F_3^{\beta\alpha}\right); \pi_2^{\beta\alpha}\right]\right)$ is listed. In the mixed duopoly market, the cooperative chooses a complete differentiation pricing policy to attract farmers. All the farmers deliver to the cooperative. In the cooperative market, there is mixed strategy equilibrium. Cooperatives choose the complete differentiation pricing policy and farmers are indifferent in choosing either cooperative. Only the IOF market is not an equilibrium market structure. The equilibrium is either a mixed market with all farmers in one cooperative, or a cooperative market. All the value-added is obtained by farmers, i.e. farmer j receives a payoff of $R_j - c_j$ in these market structures.

Table 5.8 Market structure and farmer payoffs when partial pooling is based on sales price and $R_2 > \frac{R_1 + R_3}{2}$

$e = 1$ \ $e = 2$	IOF		Coop	
IOF	$\left(\left[(\varepsilon, \varepsilon, \varepsilon); \sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_j - 3\varepsilon\right]\right.$,	$\left.[(0, 0, 0); 0]\right).$	$([(0,0,0); 0]$,	$[(R_1 - c_1, R_2 - c_2, R_3 - c_3); 0])$.
Coop	$([(R_1 - c_1, R_2 - c_2, R_3 - c_3); 0]$,	$[(0,0,0); 0])$.	$([(R_1 - c_1, R_2 - c_2, R_3 - c_3); 0]$,	$[(R_1 - c_1, R_2 - c_2, R_3 - c_3); 0])$.

Equilibrium farmer payoffs in the different markets when $R_2 < \frac{R_1 + R_3}{2}$ are summarized in table 5.9. In the mixed duopoly market, the cooperative chooses a complete differentiation pricing policy to attract farmers. All the farmers deliver to the cooperative. In the cooperative market, there is mixed strategy equilibrium. Cooperatives choose the complete pooling pricing policy and farmers are indifferent in

choosing either cooperative. Since $R_2 < \frac{R_1 + R_3}{2}$, the mixed market comprised of one cooperative (and an empty IOF) is the equilibrium outcome.

Table 5.9 Market structure and farmer payoffs when partial pooling is based on sales price and $R_2 < \frac{R_1 + R_3}{2}$

$e = 2$ / $e = 1$	IOF		Coop	
IOF	$\left(\left[(\varepsilon, \varepsilon, \varepsilon); \sum_{j=1}^{3} R_j - \sum_{j=1}^{3} c_1 - 3\varepsilon\right],\right.$	$\left.[(0,0,0); 0]\right).$	$([(0,0,0); 0],$	$[(R_1 - c_1, R_2 - c_2, R_3 - c_3); 0]).$
Coop	$([(R_1 - c_1, R_2 - c_2, R_3 - c_3); \ 0],$	$[(0,0,0); 0]]).$	$\left(\left[\left(\frac{14R_1 + 5R_2 + 5R_3}{24} - c_1, \frac{5R_1 + 14R_2 + 5R_3}{24} - c_2, \frac{5R_1 + 5R_2 + 14R_3}{24} - c_3\right); 0\right],\right.$	$\left.\left[\left(\frac{14R_1 + 5R_2 + 5R_3}{24} - c_1, \frac{5R_1 + 14R_2 + 5R_3}{24} - c_2, \frac{5R_1 + 5R_2 + 14R_3}{24} - c_3\right); 0\right]\right).$

5.4.2 Partial pooling based on sales price and quality premium

A cooperative adopting a partial pooling scheme based on only sales prices is not able to discourage low quality farmers from joining the membership. The effect of an additional parameter, quality premium, will therefore be investigated. Define γ_j as the quality premium paid to farmer j. Farmer j delivering to the cooperative receives a differential price comprised of the pooling price and a quality premium, i.e.

$$p_{jb}^{ec} = (1 - \theta) \frac{\sum_{j=1}^{3} q_j^{eC} p_{js}^{eC}}{\sum_{j=1}^{3} q_j^{eC}} + \theta \gamma_j.$$

Consider firstly the mixed duopoly market. The case $\theta = 0$, i.e. there is complete pooling, has been analyzed in the previous section. When $\theta = 1$, i.e. there is no pooling, or complete differentiation, then $p_{1b}^{2c} = \gamma_1$, $p_{2b}^{2c} = \gamma_2$, and $p_{3b}^{2c} = \gamma_3$, subject to $\sum_{j=1}^{3} \gamma_j q_j^{2c} = \sum_{j=1}^{3} R_j q_j^{2c}$. The outlet choice of each farmer depends on the size of the quality premium. Farmer j delivers to the cooperative when the quality premium for product j is no less than the reservation price, i.e. $\gamma_j \geq R_j$. Otherwise the IOF will choose a procurement price larger than γ_j to attract farmer j.

Proposition 5: *If quality premiums are part of the transfer pricing scheme in the cooperative, then any membership composition of the cooperative in the mixed market can be sustained as an equilibrium outcome by choosing the quality premium of the farmers outside the membership sufficiently low. Each member of the cooperative receives the consumer reservation price, while farmers outside the cooperative receive less than the consumer reservation price.*

All three farmers deliver to the cooperative is an equilibrium when $\gamma_j = R_j$. However, also $\gamma_1 = 0$, $\gamma_2 = R_2$, and $\gamma_3 = R_3$ is an equilibrium. This is a high quality cooperative. Farmer 1 will earn ε in the IOF. Similarly, $\gamma_1 = R_1$, $\gamma_2 = R_2$, and $\gamma_3 = 0$ is also an equilibrium with a low quality cooperative.

A payment scheme comprised of a quality premium can be set to include or exclude any farmer from the cooperative in the mixed market. This result entails an indeterminateness of the equilibrium composition of the membership of the cooperative in the mixed market. A cooperative can consist of a high quality membership, but a cooperative consisting of a low quality membership can also be sustained as an equilibrium membership composition. This raises the question how the quality premiums are determined. This question will not be addressed in this article.

Quality premiums in the cooperative market will be set such that each farmer earns the consumer reservation price. Every composition of the membership of the cooperatives is an equilibrium outcome. Farmers earn hardly anything in the IOF market. The equilibrium market structure is now straightforward to determine. The cooperative market is the unique market structure when not all farmers are in the cooperative in the mixed market. Otherwise the mixed market with all farmers in the cooperative and the cooperative market, are equilibrium market structures.

Research regarding quality provision and the role of cooperatives considers frequently the effect of membership policy (Sexton, 1990; Karantininis and Zago, 2001). The distinction between an open and closed membership policy is considered to be crucial. Both Helmberger (1964) and Sexton (1990) argue that the yardstick effect of cooperatives depends on the assumption of an open membership policy. Challenging this result, Karantininis and Zago (2001) point out that the relative advantage of the cooperative vanishes if it applies an open membership policy. LeVay (1983) maintains that an open-membership cooperative overproduces beyond the social optimum. However, we show that cooperatives determine their membership composition by their payment scheme, rather than via the membership policy. A cooperative may exclude low quality farmers by paying them a low quality premium. They choose voluntarily not to become a member. Similarly, a high extent of pooling discourages high quality farmers to become a member of the cooperative.

5.5 Conclusion and further research

This article examines farmers' outlet and production choices in a differentiated product market. Enterprises in the market choose to adopt either an IOF or a cooperative governance structure. An IOF prices products differentially and earns the difference between input prices and output prices. A cooperative adopts either a pooling or differential pricing policy and distributes all revenues to members. The market consisting of cooperatives is an equilibrium. Farmers' outlet choices in the mixed duopoly depend on the pricing policy of the cooperative. In the market where cooperatives

adopt a complete pooling price policy, farmers with low quality products deliver to the cooperative, whereas farmers with high quality products deliver to the IOF. The structure of quality premiums in a cooperative may reverse this result.

The presence of the cooperative in the market has a competitive yardstick effect. An IOF is forced to increase the procurement prices in order to attract farmers when it competes with a cooperative. The commitment of the cooperative to a (partial) pooling price policy is responsible for this effect. Not only farmers delivering to the cooperative receive a higher surplus, but also the other farmers receive more compared to the IOF market. The competitive yardstick effect of cooperatives is therefore a public goods (Staatz, 1984). There is a positive relationship between the market share of cooperatives and the prices received by farmers. The yardstick effect becomes stronger when the cooperative adopts a more differentiated price policy. The differentiation in pricing provides incentives for high quality farmers to join the cooperative. The IOF has to respond with paying higher procurement prices to attract farmers. It therefore forces the market towards higher procurement prices.

There are various possibilities for further research. One possibility is to consider other aspects of the governance structure of cooperatives. We have highlighted the structure of income rights in terms of the price being paid for each quality level, which determines the quality of products provided by cooperatives, and the role of ownership rights in terms of a constitutional rule consisting of majority voting. Issues regarding efficiency and equity have to be addressed. The role of decision rights has not been addressed. This may turn out to be important for the provision of quality by cooperatives because the distinction in a cooperative between ownership of the members and control by managers is important for the viability of the cooperative due to their diverging focus and interests.

Another direction of research is the relationship between the market share of cooperatives and the procurement prices paid to farmers. We investigated this relationship by comparing two market structures which are not equilibrium outcomes with a market structure which is an equilibrium outcome. A positive relationship is established in a model where the equilibrium market structure consists of only cooperatives. However, most agricultural markets are characterized by the coexistence of IOFs and cooperatives. The question arises therefore whether the positive relationship between the market share of cooperatives and procurement prices paid to farmers continues to hold in a model where the equilibrium is characterized by coexistence of cooperatives and IOFs.

Chapter 6: Summary and Conclusion

There are various governance structures in an agricultural supply chain, such as spot markets, contracting, cooperatives, investor-owned firms, and so on. Governance structure is defined as the allocation of ownership rights, decision rights and income rights over relevant assets (Hansmann, 1996). Ownership rights specify the formal rights regarding the residual control of assets, like the property rights regarding the assets and the distribution of voting rights over the membership. Decision rights in the form of authority and responsibility address the question 'Who has authority or control (regarding the use of assets)?'. Income rights address the question 'How are benefits and costs allocated?'. A cooperative is characterized by member control and member benefit. A farmer cooperative is collectively owned to help farmers enter the markets. The focus of this thesis is mainly on income rights, but ownership rights and decision rights are considered as well.

A summary of the chapters, as well as main findings, is presented in this final chapter. This thesis has addressed issues on the genesis, the governance structure, the CEO identity, and the quality of products of farmer cooperatives. A cooperative is characterized by user ownership, user control, and user benefits. Special attention is placed on various aspects of farmer cooperatives in China in the first three chapters, while chapter 4 and 5 apply to cooperatives in general. Firstly, it provides an overview of farmer cooperatives in China in terms of the history, the governance modes, and organization characteristics (chapter 1). Secondly, it describes the genesis of Chinese farmer cooperatives (chapter 2). Thirdly, it delineates the governance structure of Chinese farmer cooperatives in terms of the allocation of ownership rights, decision rights, and income rights between heterogeneous members (chapter 3). Fourth, it compares the efficiency of cooperatives with member CEOs and with outside CEOs (chapter 4). Fifth, it examines the outlet choices (between cooperatives and investor-owned firms) of farmers producing different quality products and the impact of cooperatives' presence in the market on the welfare of various stakeholders (chapter 5).

An overall introduction of the thesis, including the background and motivation of the research, a picture regarding farmer cooperatives in China, research objectives and questions, and the outline of the thesis, is presented in **Chapter 1**. The agricultural supply chain in China is diversified at present and undergoing transformation in both structure and management. It includes not only the traditional production-supply-marketing system constituting of small farm households, peddlers, processing enterprises, wholesalers, and retailers, but also new retailers such as comprehensive supermarkets, specialized fruit supermarkets, and chain stores. Small farmers are incapable of negotiating effectively with other parties in the supply chain due to the scarcity of market information and their small

production scales. Collective action via farmer cooperatives is one of the most important institutional innovations serving farmers' purposes.

Farmer cooperation in China dates back to the early 1950s and was characterized by collective ownership by the State or the government. Farmer cooperatives, characterized by farmer ownership and farmer control and benefits, began to emerge in the 1980s. Chinese farmer cooperatives come in various forms, like farmer specialized cooperative, farmer specialized association, cooperative union, and rural credit cooperative. We gear attention to the farmer specialized cooperatives which are referred to as cooperatives or farmer cooperatives in this thesis.

Chapter 2 charts the genesis of cooperatives in China by a survey from the perspective of main actors, as well as the organizational characteristics pertained to the environmental constraints. We find the genesis of cooperatives in China is incited by the entrepreneurs' economic ambitions and the government's economic and political objectives, rather than the small farmers' collective actions. Examples of entrepreneurs are those who used to be a village head, who used to work in the governmental department, who used to do transportation and sales of agri-products, who used to run a company, and who used to be a large farmer. The genesis of organizations is imprinted by the environmental conditions (Carroll and Hannan, 1989). The heterogeneity of farmers in rural China, the distinguished capability of a few entrepreneurial farmers and the limited capability of most small farmers, determines the alternative roles of farmers. In addition, Chinese governments, both central and local, have been promoting the genesis and development of farmer cooperatives through various ways such as promulgation of the Cooperative Law, direct guidance and training during foundation, tax exemption, funding, and so on.

In **Chapter 3** the governance structure characteristics of 37 farmer cooperatives in Zhejiang province, China is delineated in terms of ownership rights, decision rights, and income rights. The factors that contribute to the genesis of an organization continue to affect the patterns of the organization later (Hannan and Freeman, 1984). In line with the characteristics of the genesis of cooperatives in the previous chapter, these entrepreneurial farmers, referred to as core members, dominate in the allocation of ownership rights, control rights, and income rights within farmer cooperatives. Core members usually have substantial asset capital, marketing capabilities, and/or social relations, while common members are good at farming but not experienced at marketing or management. The allocation of ownership rights, decision rights, and income rights is therefore quite skewed towards core members.

Ownership rights reside with (the majority of) the membership in a cooperative in China. All the members have rights to vote formally, but the number of votes differs between members. Control

rights over an asset should lie with those who can make best use of the asset or who can generate the most surpluses from using the asset (Hart and Moore, 1996). Common members are aware that they are inferior in capabilities and have to free ride on high ability farmers. They regard that their efforts will not greatly affect the performance of the cooperative. Neither will they expect their effort getting paid. Hence, common members delegate and relinquish voting rights to core members.

Cooperatives may seem to be hampered by having the ownership rights allocated collectively among members, but there are many possibilities for structuring the bylaws, in terms of decision and income rights. One possibility is to distinguish formal and real authority. Formal authority resides with the members, whereas real authority can be either centralized or decentralized (Hendrikse, 2005). Real authority is therefore delegated by the members to the management. The management in Chinese cooperatives is comprised of core members. They then have sufficient and dominant influence over the management and operation of cooperatives in China.

There are many degrees of freedom to structure the income rights in a cooperative. Most cooperatives in the Western countries return profits on the basis of delivery or patronage. Return on equity capital is limited (Dunn, 1988; Cook and Plunkett, 2006). However, the income rights distribution mechanism in cooperatives in China deviates from the principle of US cooperatives regarding the distribution of benefits. The proportion of the return based on equity capital versus patronage depends to a large extent on the capabilities of the core members in the cooperative. Core members have superior knowledge over common members and are able to produce more benefits for cooperatives, which needs to be complemented by a higher residual income. The allocation of income rights is therefore skewed towards core members. In order to protect common members and to maintain the cooperative principle of member benefits, the Law requires that the profit distributed on the basis of patronage must be at least 60% of total distributable profit.

In **Chapter 4**, the efficiency of different CEO identities of cooperatives is investigated. CEO identity varies in different countries and different stages of cooperative development. Most cooperatives in China nowadays have member CEOs rather than professional outside CEOs. The reverse holds for cooperatives in Western countries. This situation is more mixed in Spain and Brazil. A member CEO puts efforts in both the upstream farming activities and downstream value-adding activities, whereas an outside CEO only devotes time to downstream value-adding activities.

A principal-agent model is developed to address the CEO incentive problem and to compare the efficiencies of a cooperative with a member CEO and a cooperative with an outside CEO. Results show that whether a member CEO or an outside CEO is efficient depends on the marginal productivities of, and interactions between, upstream farming and downstream value adding tasks.

When there is a complementary relation between the two tasks and when alternative CEOs have the same marginal productivity regarding the downstream value adding activity, a cooperative with a member CEO is always efficient, compared to that with an outside CEO. The efficiency of CEO identity depends on the size of the substitution effect as well as the marginal productivities when upstream and downstream tasks are substitutes. In cases where the substitution effect of upstream and downstream tasks is sufficiently small or large and/or where the difference of the marginal productivity between upstream and downstream tasks are sufficiently large, cooperatives with member CEOs are efficient. Otherwise, cooperatives with outside CEOs are efficient.

CEOs with different identities may differ in marginal productivity regarding the downstream value-adding activities. Outside CEOs tend to be more professional in management and marketing, while member CEOs are likely to be more production-oriented. Therefore, the scope for cooperatives with member CEOs being uniquely efficient becomes smaller when the marginal productivity of outside CEOs' value adding activity is larger than that of member CEOs' value adding activity, and vice versa. The interdependency between upstream and downstream tasks matters to the efficiency of alternative governance structures as well. When the two tasks are complements, as the interdependence becomes stronger, the scope that cooperatives with member CEOs being efficient becomes larger. Yet when the effect of the substitution effect between the two tasks is small or large, the scope that cooperatives with member CEOs being efficient is relatively large.

In **Chapter 5**, the outlet choices of farmers with different quality products are examined. Most agricultural markets show differentiated products and coexistence of cooperatives and IOFs. Some markets have low quality products provided by cooperatives and high quality products by IOFs. However, the opposite is also observed. We examine how farmers producing differentiated products choose different governance structures in a non-cooperative game with farmers and enterprises. Farmers producing low quality products tend to deliver to cooperatives whereas farmers producing high quality products would like to deliver to IOFs when cooperatives apply a pooling strategy in pricing. Yet differential payments regarding quality in cooperatives provide incentives for high quality farmers to join cooperatives. Henceforce, farmers' outlet choices depend crucially on the payment treatment of members regarding quality within the cooperatives.

The presence of cooperatives in a food market has a competitive yardstick effect, i.e. there is a positive relationship between the market share of cooperatives and the price received by farmers. The practice of pooling prices is responsible for this positive relationship in the model. If the membership increases, and therefore the average quality of products provided by members, then the pooling price increases. IOFs have to match the pooling price in order to compete with cooperatives. The yardstick

effect gets stronger as the degree of price differentiation within a cooperative increases. The differential quality treatment of cooperatives provides an incentive for high quality farmers to join cooperatives. IOFs therefore have to increase the procurement prices paid to farmers when the market share of cooperatives increases.

Reference

Adams, R., B. Hermalin, and M. Weisbach, 2008. The role of boards of directors in corporate governance: A conceptual framework and survey. National Bureau of Economic Research Cambridge, Mass., USA.

Aghion, P. and Tirole, J., 1997. Formal and real authority in organizations. *Journal of Political Economy*, 105(1): 1-29.

Baarda, J.R. 1982. State incorporation statutes for farmer cooperatives. Washington, D.C.: USDA ACS Coop. Info. Rep. 30, Oct.

Baker, G., R. Gibbons, and K. Murphy, 1999. Information authority in organization. *Journal of Law, Economics, and Organization*, 15(1): 56-73.

Baker, G., R. Gibbons, and K. Murphy, 2002. Relational contracts and the theory of the firm. *Quarterly Journal of Economics*, 117(1): 39-84.

Baker, G., R. Gibbons, and K. Murphy, 2008. Strategic alliances: Bridges between "islands of conscious power". *Journal of the Japanese and International Economics*, 22(2): 146-163.

Bijman, J. and B. Doorneweert, 2008. Entrepreneurship, Collective Entrepreneurship and the Producer-Owned Firm. Paper presented at the 12th Congress of the European Association of Agricultural Economists, Ghent, Belgium, August 26-29.

Bijman, J, and G.W.J. Hendrikse, 2003. Co-operatives in chains: Institutional restructuring in the Dutch fruit and vegetable industry. *Journal on Chain and Network Science*, 3(2): 95-107.

Bijman, J., C. Iliopoulos, K.J. Poppe, C. Gijselinckx, K. Hagendorn, M. Hanisch, G.W.J. Hendrikse, R. Kuhl, P. Ollila, P. Pyykkonen, and G. van der Sangen, 2012. Support for farmers' Cooperatives, Final report, Wageningen UR.

Bolton, P., 1995. Privatization and the separation of ownership and control: Lessons from Chinese enterprise reform. *Economics of Transition*, 3(1): 1-12.

Bond, J.K., 2009. Cooperative financial performance and board of director characteristics: A quantitative investigation. *Journal of Cooperatives*, 22: 22-44.

Burress, M.J. and M.L. Cook, 2010. Director development and board-CEO relations: Do recommendations from corporate governance apply to the agribusiness cooperative? Working paper, Missouri University.

Burress, M.J., M.L. Cook, and D.J. O Brien, 2011. Governing agribusiness: The impact of board

structure and process on performance of producer-owned agribusinesses. Working paper, Missouri University.

Carlton, D.W. and J.M. Perloff, 1990. Modern Industrial Organization. Scott, Foresman/Little, Brown High Education.

Carroll, G.R., J. Goodstein, and A. Gyenes, 1988. Organizations and the states: Effects of the institutional environment on agricultural cooperatives in Hungary. *Administrative Science Quarterly,* 33(2): 233-256.

Carroll, G.R. and M.T. Hannan, 1989. Density delay in the evolution of organizational populations: A model and five empirical tests. *Administrative Science Quarterly*, 34: 411-430.

Cechin, A., J. Bijman, S. Pascucci, D. Zylbersztajn, and O. Omta, 2012. Quality provision in Cooperatives versus Investor Owned Firms: The case of broiler production in Brazil. Forthcoming in *Managerial and Decision Economics*.

Cervantes, C.R. and M. Fernándes, 2008. Cooperativism in Portugal and Spain from the Dictatorships to European Integration, 1940-2006. Paper presented at the *Spanish Association of Economic History Congress*, Murcia. Available at http://www.um.es/ixcongresoaehe/pdfB11/cooperativisim.pdf

Clark, E., 1952. Farmer cooperatives and economic welfare. *Journal of Farm Economics*, 34(1): 35-51.

Coase, R.H., 1937. The nature of the firm. *Economica*, 4(16): 386-405.

Cook, M.L., 1994. The role of management behaviour in agricultural cooperatives. *Journal of Agricultural Cooperation*, 9: 42-58.

Cook, M.L., 1995. The future of US agricultural cooperatives: A neo-institutional approach. *American Journal of Agricultural Economics,* 77(5): 1153-1159.

Cook, M.L. and B. Plunkett, 2006. Collective entrepreneurship: An emerging phenomenon in producer-owned organizations. *Journal of Agricultural and Applied Economics,* 38(2): 421-428.

Cotterill, R.W., 1987. Agricultural cooperatives: A unified theory of pricing, finance and investment. In J.S. Royer (ed.) Cooperative Theory: New approaches, Agricultural Co-operative Service (ACS Service Report 18), U.S. Department of Agriculture: Washington D.C.: 171-258.

Daily, C.M. and D.R. Dalton, 1993. Board of directors leadership and structure: Control and performance implications. *Entrepreneurship Theory and Practice*, 17: 65-65.

Dixit, A., 2002. Incentives and organizations in the public sector: An interpretative review. *Journal of Human Resources*, 37(4): 696-727.

Dunn, J.R. 1988. Basic cooperative principles and their relationship to selected practices. *Journal of Agricultural Cooperation,* 3: 83-93.

Dunn, J.R., 2002. Agricultural cooperatives in the 21st century. Report, US Dept. of Agriculture, Rural Business--Cooperative Service.

Eisenhardt, K.M. and C.B. Schoonhoven, 1990. Organizational growth: Linking founding tem, strategy, environment, and growth among U.S. semiconductor ventures, 1978-1988. *Administrative Science Quarterly*, 35(3): 504-529.

Fama, E.F., 1980. Agency Problems and the theory of the firm. The Journal of Political Economy, 88(2): 288-307.

Feng, L. 2011. Motivation, Coordination and Cognition in Cooperatives. ERIM PhD series in Erasmus University Rotterdam, EPS-2010-220-ORG, ISBN 978-90-5892-261-8.

Feng, L. and G.W.J. Hendrikse, 2011. Coordination and governance: The case of cooperatives versus IOFs. Paper presented at the EAAE 2011 Congress "Change and Uncertainty: Challenges for Agriculture, Food and Natural Resources", Zurich, Switzerland, Aug. 30 – Sep. 2.

Feng, L. and G.W.J. Hendrikse. 2012. Chain interdependencies, measurement problems and efficient governance structure: Cooperatives versus publicly listed firms. *European Review of Agricultural Economics*, 39(2): 241-255.

Frick, B., 2004. Does ownership matter? Empirical evidence from the German wine industry. *Kyklos*, 57: 357-386.

Fulton, M., 1995. The future of Canadian agricultural cooperatives: A property rights approach. *American Journal of Agricultural Economics* 77(5): 1144-1152.

Fulton, M. and K. Sanderson, 2002. Co-Operatives and farmers in the new agriculture. Working paper, Centre for the Study of Co-operatives, University of Saskatchewan.

Gardner, B. and Z. Lerman, 2006. Agricultural cooperative enterprise in the transition from socialist collective farming. *Journal of Rural Cooperation,* 34(1): 1-18.

Garen, J.E., 1994. Executive compensation and principal-agent theory. *Journal of Political Economy*, 102(6): 1175-1199.

Giagnocavo, C., 2010. Modern Agriculture, Sustainable Innovation and Cooperative Banks: The Development of Almería (1963-2010). Available at http://www.euricse.eu/it/node/694

Golovina, S. and J. Nilsson, 2009. Russian agricultural producers' views of top-down organized

cooperatives. *Journal of Rural Cooperation,* 37(2), 225-241.

Gripsrud, G., G.H. Lenvik, and N.V. Olsen, 2000. Influence activities in agricultural cooperatives: The impact of heterogeneity. Paper submitted to the conference "The Food Sector in Transition– Nordic Research", Oslo, Norway, Jun. 14-15.

Grossman, S.J., 1981. The informational role of warranties and private disclosure about product quality. *Journal of Law and Economics*, 24(3): 461-483.

Guo, H. and W. Jiang, 2004. Analysis on the influencing factors of farmers' joining into cooperatives. *Economic Research Reference*, 63: 10-16, 30.

Haleblian, J. and S. Finkelstein, 1993. Top management term size, CEO dominance, and firm performance: The moderating roles of environmental turbulence and discretion. *The Academy of Management Journal*, 36(4): 844-863.

Hanisch, M., J. Rommel, and M. Müller, 2012. Variation in farm gate milk prices and the cooperative yardstick revisited – Panel evidence from the European dairy sectors. A report for the project "Support for Farmers' Cooperatives".

Hannan, M.T. and J.H. Freeman, 1984. Structural inertia and organizational change. *American Sociological Review*, 49: 149-164.

Hansmann, H., 1996. The ownership of enterprise, Harvard University Press.

Harris, A., B. Stefanson, and M. Fulton, 1996. New generation cooperatives and cooperative theory. *Journal of Cooperatives,* 11: 15-28.

Hart, O. and J. Moore, 1990. Property rights and the nature of the firm. *Journal of political economy,* 98(6): 1119-1158.

Hart, O. and J. Moore, 1996. The governance of exchanges: Members' cooperatives versus outside ownership. *Oxford Review of Economic Policy*, 12 (4): 63-69.

Hart, O. and J. Moore, 2005. On the design of hierarchies: Coordination versus specialization. *Journal of Political Economy,* 113(4): 675-702.

Haubrich, J.G., 1994. Risk aversion, performance pay, and principal-agent problem. *Journal of Political Economy*, 102(2): 258-276.

Hazell, P., C. Poulton, S. Wiggins, and A. Dorward, 2006. The future of small farms: synthesis paper. Based on Research Workshop organized by IFPRI, ODI and Imperial College, Wye.

Helmberger, P.G., 1964. Cooperative enterprise as a structural dimension of farm markets. *Journal of Farm Economics*, 46(3): 603-617.

Helper, S., 1991. How much has really changed between U.S. manufactures and their suppliers? *Sloan Management Review*, 32(4): 15-28.

Hendrikse, G.W.J., 2005. Boards in agricultural cooperatives: Competence, authority, and incentives. Working paper, Rotterdam School of Management, Erasmus University, ERS-2005-042-ORG.

Hendrikse, G.W.J, 2007a. On the co-existence of spot and contract markets: The delivery requirement as contract externality. *European Review of Agricultural Economics*, 34(2): 257-282.

Hendrikse, G.W.J., 2007b. Two vignettes regarding boards in cooperatives versus corporations: Irrelevance and incentives. In K. Karantininis and J. Nilsson (eds.) Vertical Markets and Cooperative Hierarchies, Dordrecht: Springer; 137-150.

Hendrikse, G.W.J., 2011. Pooling, access, and countervailing power in channel governance. *Management Science,* 57(9): 1692-2002.

Hendriksem G.W.J. and C,P. Veerman, 2001. Marketing co-operatives: An incomplete contracting perspective. *Journal of Agricultural Economics*, 52(1): 53-64.

Hermalin, B.E. and M.S. Weisbach, 1991. The effects of board composition and direct incentives on firm performance. *Financial Management*, 20 (4): 101-112.

Hillman, A.J., C. Shropshire, and A.A. Cannella, 2007. Organizational predictors of women on corporate boards. *The Academy of Management Journal*, 50(4): 941-952.

Hirschman, A.O., 1970. Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States. Harvard University Press Cambridge, MA.,

Hoffmann, R., 2005. Ownership Structure and Endogenous Quality Choice: Cooperatives versus Investor-Owned Firms. *Journal of Agricultural & Food Industrial Organization*, 3(8): 1-24

Holjman, D.A. and A. Szeidl, 2008. Core and periphery in networks. *Journal of Economic Theory,* 139(1): 295-309.

Holmström, B., 1999. Future of cooperatives: A corporate perspective. *The Finnish Journal of Business Economics,* 4: 404–417.

Holmstrom, B. and P. Milgrom, 1991. Multitask principal-agent analyses: incentive contracts, asset ownership, and job design. *Journal of Law, Economics, and organization*: 7 (special issue): 24-52.

Hu, D., T. Reardon, and S. Rozelle, 2004. The emergence of supermarkets with Chinese characteristics: Challenges and opportunities for China's agricultural development. *Development Policy Review*, 22(5): 557-586.

Huang, S., 2008. Analysis on the Behavior of Farmer Cooperatives in Transforming Time in China. Zhejiang University Press: Hangzhou.

Huang, Y., 2012. How did China take off? *Journal of Economic Perspectives*, 26(4): 147-170.

Huang, Z. and Q. Liang, 2009. The efficiency of alternative organizations in pear supply chain and its influence on farmers: Based on an empirical study in Zhejiang. *Journal of Northwest Agriculture and Forestry University*, 1: 36-40.

Huang, S. and X. Xu, 2006. The cooperative governance based on capabilities and relations. *Zhejiang Social Sciences,* 1: 60-66.

Huang, S. and X. Xu, 2008. Analysis on member heterogeneity and organizational structure of farmer cooperatives. *Journal of Nanjing Agricultural University (Social Science Version),* 8(3): 1-7 and 43.

Hueth, B. and P. Marcoul, 2009. Incentive pay for CEOs in cooperative firms. *American Journal of Agricultural Economics*, 91(5): 1218-1223.

Iliopoulos, C. and M.L. Cook, 1999. The efficiency of internal resource allocation decisions in customer-owned firms: The influence costs problem. Paper presented at the 3rd Annual Conference "The International Society for New Institutional Economics", Washington D.C., Sep. 16-18.

Iliopoulos, C. and V. Valentinov, 2012. Opportunism in agricultural cooperatives in Greece. *Outlook on Agriculture,* 41(1): 15-19.

Internationaal Cooperatief Centrum, 2012. Available at www.icc-kasteelgemert.nl/icc

Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. *Journal of Finance*, 48(3): 831-880.

Jensen, M.C. and W.H. Meckling, 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, 3(4): 305-360.

Karantinis, K. and A. Zago, 2001. Endogenous membership in mixed duopsonies. *American Journal of Agricultural Economics*, 83(5), 1266-1272.

Küble, D. and W. Müller, 2002. Simultaneous and Sequential price competition in heterogeneous duopoly markets: Experimental evidence. *International Journal of Industrial Organization*, 20: 1437-1460.

Kuilman, J.G., I. Vermeulen, and J. Li, 2009. The consequents of organizer ecologies: A logical formalization. *Academy of Management Review*, 34(2): 253-272.

Lang, M.G., 2002. Strengthening agricultural cooperatives: An inquiry into expert beliefs. Report, Center for Cooperatives, University of California.

Landgard. June 29, 2012. Available at https://www.landgard.de

LeVay, C., 1983. Agricultural co-operative theory: A review. *Journal of Agricultural Economics*, 34(1): 1-44.

Liang, Q. and W.J.G. Hendrikse, 2013. Core and common members in the genesis of farmer cooperatives in China. *Managerial and Decision Economics,* forthcoming.

Lin, J. and S. Huang, 2007. Member heterogeneity and ownership rights in farmer cooperatives. *Agricultural Economy Issue,* 10: 12-17.

Lin, J. and Y. Ma, 2006. The boundary between farmer cooperatives and IOFs: From the perspective of transaction cost and organizational cost. *Agricultural Economics Issue*, 3: 16-20.

Lind, L.W., 2011. The demutualization of a cooperative - Swedish Meats. Paper presented at the EAAE (European Association of Agricultural Economists) Congress.

Ma, Y. and C. Meng, 2008. The dual-agency relations in farmer cooperatives in China: The problem and improvement ideas. *Agricultural Economic Issue,* 5: 55-60.

Madhok, A., 1996. The organization of Economic Activity: Transaction Costs, Firm capabilities, and the Nature of Governance. *Organization Science,* 7(5): 577-590.

Milford, A., 2004. Coffee, cooperatives and competition: The impact of fair trade. CMI Report, Chr. Michelsen Institute, Bergen, Norway.

Milgrom, P.R. and J. Roberts, 1982. Limit pricing and entry under incomplete information: An equilibrium analysis. *Econometrica: Journal of the Econometric Society*, 50(2): 443-459.

Milgrom, P.R. and J. Roberts, 1992. Economics, Organization and Management. Prentice-Hall Englewood Cliffs, USA.

Moselland. June 29, 2012. Available at www.moselland.de

Nilsson, J., 1998. The emergence of new organizational models for agricultural cooperatives. *Swedish Journal of Agricultural Research*, 28(1): 39-47.

Núñez-Nickel, M. and J. Moyano-Fuentes, 2004. Ownership Structure of Cooperatives as an Environmental Buffer. *Journal of Management Studies,* 41: 1131–1152.

Olson, M., 1965. The Logic of Collective Action. Harvard University Press: Cambridge & Massachusetts.

Ortmann, G.F. and R.P. King, 2007. Agricultural cooperatives I: History, theory and problems. *Agrekon*, 46(1): 40-68.

Pearce, J.A., 1983. The relationship of internal versus external orientations to financial measures of strategic performance. *Strategic Management Journal*, 4(4): 297-306.

Pencavel, J., 2001. Worker Participation: Lessons from the Worker Co-ops of the Pacific Northwest. Russell Sage Foundation Publications.

Pennerstorfer, D. and C.R. Weiss, 2012. Product quality in the agri-food chain: Do cooperatives offer high-quality wine? *European Review of Agricultural Economics*, 1: 1-20.

Rogers, R.T. and L.M. Petraglia, 1994. Agricultural cooperatives and market performance in food manufacturing: Implications for Market Performance. *Journal of Agricultural Cooperation*, 9: 1-12.

Royer, J.S., 1992. Cooperative principles and equity financing: A critical discussion. *Journal of Agricultural cooperation,* 7: 79-98.

Royer, J.S., 1999. Co-operative organizational strategies: A neo-institutional digest. *Journal of Cooperatives*, 14(1): 44-67.

Saitone, T.L. and R.J. Sexton, 2009. Optimal cooperative pooling in a quality-differentiated market. Paper presented at International Conference Rural Cooperative in the 21st Century: Lessons from the Past, Pathways to the Future, 14-17, June, The Hebrew University of Jerusalem, Israel.

Sexton, R.J., 1986. The formation of cooperatives: A game-theoretic approach with implications for cooperatives. Giannini Foundation Information Series No. 88-3, University of California.

Sexton, R.J., 1990. Imperfect competition in agricultural markets and the role of cooperatives: a spatial analysis. *American Journal of Agricultural Economics*, 72(3), 709-720.

Sexton, R.J. and J. Iskow, 1988. Factors critical to the success or failure of emerging agricultural cooperatives. Working paper, Giannini Foundation Information Series No. 88-3.

Sexton, R.J. and N. Lavoie, 2001. Food processing and distribution: An industrial organization approach. In B. Gardner and G. Rausser (eds.) Handbook of Agricultural Economics, Elsevier: Amsterdam; 863-932.

Sexton, R.J. and T.A. Sexton, 1987. Cooperatives as an entrant. *The RAND Journal of Economics*, 18(4): 581-595.

Shaffer, J.D., 1982. Notes for a more comprehensive theory of farmer owned cooperative system. Cooperative Theory Working Paper, Department of Agricultural Economics, Michigan State University.

Spengler, J.J., 1950. Vertical integration and antitrust policy. *Journal of Political Economy*, 58(4): 347-352.

Staatz, J.M. 1984. A Theoretical Perspective on the Behavior of Farmers' Cooperatives. Ph.D. Dissertation, Department of Agricultural Economics, Michigan State University, USA.

Staatz, J.M., 1987. The structural characteristics of farmer cooperatives and their behavioral consequences. In J.S. Royer (ed.) Cooperative Theory: New approaches, Agricultural Co-operative Service (ACS Service Report 18), U.S. Department of Agriculture: Washington D.C.; 33-60.

Staatz, J.M., 1987. A game-theoretic analysis of decision-making in farmer cooperatives. In J.S. Royer (ed.), Cooperative Theory: New Approaches (ACS Service Report 18), U.S. Department of Agriculture: Washington, D.C.; 117-147.

Staatz, J.M., 1987. Farmers' incentive to take collective action via cooperatives: a transaction cost approach. In J.S. Royer (ed.), Cooperative Theory: New Approaches (ACS Service Report 18), U.S. Department of Agriculture: Washington DC; 87-107.

Stichcombe, A.L., 1965. Social structure and organization. In J. March (ed.) Handbook of Organizations, Rand McNally: Chicago; 142-193.

Sultan, T. and A. Wolz, 2012. Agricultural cooperative development in China and Vietnam since decollectivization. Paper presented the 2nd eRNAC Conference on Agricultural Cooperatives: Cooperative Values in Internationalized Operations, Helsinki, Finland, June 14-16.

Sun, Y., 2006. The Study on New Style Farmer Cooperative Development. Social Science Academic Press: Beijing.

Sutton, J., 1991. Sunk Costs and Market Structure. The MIT Press Cambridge, Massachusetts: London, England.

Sykuta, M.E. and M.L. Cook, 2001. A new institutional economics approach to contracts and cooperatives. *American Journal of Agricultural Economics*, 83 (5): 1273-1279.

Sykuta, M.E. and F.R. Chaddad, 1999. Putting theories of the firm in their place: A supplemental digest of the new institutional economics. *Journal of Cooperatives*, 14: 68-76.

Theodorakopoulou, I. and C. Iliopoulos, 2012. Support for farmers' cooperatives: Sector report wine. Wageningen: Wageningen UR.

Thomas, A., 1988. Does leadership make a difference to organizational performance? *Administrative Science Quarterly*, 33(3): 388-400.

Tosi Jr., H.L. and L.R. Gomez-Mejia, 1989. The decoupling of CEO pay and performance: An agency theory perspective. *Administrative Science Quarterly*, 34(2): 169-189.

Tribl, C., 2009. Spatial competition of food processing cooperatives in a mixed market–the case of uniform delivered pricing. Working paper, Federal Institute of Agricultural Economics, Austria.

USDA. 2002. Agricultural cooperatives in the 21st century. Washington: Rural Business-Cooperative Service, Cooperative Information Report 60.

Valentinov, V., 2007. Why are cooperatives important in agriculture? An organizational economics perspective. *Journal of institutional Economics*, 3 (1): 55-69.

Wang, A., 1997. Incentives, CEO compensation, and shareholder wealth in a dynamic agency model. *Journal of Economic Theory*, 76(1): 72-105.

Wang, J., 2010. Enlightened localism in contemporary China: Political change in property-rights institutions of township and village enterprises. *Comparative Sociology*, 9: 631-662.

Williamson, O.E., 1996. The Mechanisms of Governance. Oxford University Press: New York.

Wu, B. and X. Xu, 2009. The anti-poverty mechanism of farmer cooperatives. *Journal of Rural Economy,* 3: 115-117.

Xiong, J. and Y. Zheng, 2008. Analysis on agency cost in famer cooperatives controlled by minority members in China. *Agricultural Economy,* 11: 76-78.

Xu, X. 2005. Institutional Analysis on Farmer Specialized Cooperatives in China. The Publishing House of Economic Science.

Xu, X. and B. Wu, 2011. The poor benefit characteristic and mechanism of farmer cooperatives. Working paper, Zhejiang University.

Yu, J., 2009. Quality provision and farmer inclusion of agricultural cooperatives. Paper presented at the 27th International Association of Agricultural Economics (IAAE) Conference, August 16-22.

Zago, A.M., 1999. Quality and self-regulation in agricultural markets: How do producer organizations make the rules? *European Review of Agricultural Economics*, 26(2): 199-218.

Zhang, J., E. Goddard, and M. Lerohl, 2007. Estimating pricing games in the Wheat-handling market in Saskatchewan: The role of a major cooperative. In S. Novkovic and V. Dena (eds.) Cooperative Firms in Global Markets, Emerald Group Publishing Limited: 151-182.

Zhao, X., R. Tong, J. Gu, F. Ying, and J. Xu, 2011. The report of propelling the innovation of operating mechanism in farmer cooperatives in Zhejiang province (1). *China Farmer Cooperatives,* 5: 43-47.

Zhou, J. and S. Jin, 2009. Adoption of food safety and quality standards by China's agricultural cooperatives: A way out of monitoring production practices of numerous small-scale farmers? Paper presented at the 27th International Association of Agricultural Economics (IAAE) Conference, Beijing, China, August 16-22.

Zusman, P., 1992. Constitutional selection of collective-choice rules in a cooperative enterprise. *Journal of Economic Behavior and Organization*, 17: 353-362.

Zusman, P. and G.C. Rausser, 1994. Interorganizational influence and optimality of collective action. *Journal of Economic Behavior and Organization*, 24: 1-17.

Appendix 1: Questionnaire

A Basic information of the cooperative

1 Name of the cooperative;

2 The name of the city that the cooperative is located;

3 The year of the establishment of the cooperative;

4 Membership size of the cooperative when being established;

5 Current membership size of the cooperative;

6 Fixed capital of the cooperative when being established;

7 Current fixed capital of the cooperative;

8 Share capital of the cooperative when being established;

9 Current share capital of the cooperative;

10 Total shares of the cooperative;

11 Main products of the cooperative;

12 Total production areas;

13 The brand of the cooperative's products;

14 Total sale volume of the cooperative last production year;

15 Total sale value of the cooperative last production year.

B Membership of the cooperative

1 Geographical scope of the membership;

Within local village;
Within local town;
Within local city;
Within local province;
Nationwide.
International area.

2 Geographical scope of members' production basis;

Within local village;
Within local town;

Within local city;

Within local province;

Nationwide;

International area.

3 What is the basic membership rule of the cooperative?

   (1) Open; (2) Limited; (3) Closed.

4 If there is an open membership rule, then please specify the reasons why the cooperative chooses this rule;

5 If there is a limited membership rule, then please specify the requirements that a farmer has to meet to entry the cooperative;

6 If there is a closed membership rule, then please specify the reasons why the cooperative chooses this rule;

7 Please describe the exit rule of the cooperative.

C Board members

1 Number of members in the board of directors of the cooperative;

2 Are all the directors farmer members?

Yes; (2) No.

 If no, then the number of non-members;

3 The total capital shares of directors (%);

4 Number of members in the board of supervisors of the cooperative;

5 Are all the supervisors farmer members/

Yes; (2) No.

 If no, then the number of non-members;

6 The total capital shares of supervisors (%);

D Decision making

1 The yearly frequency of members' general meeting;

2 The purpose of the general meeting;

Technology trainings;

Decisions regarding technology innovation;

Decisions regarding business strategy;

Decisions regarding the board's personnel issues;

Others. Please specify.

3 The yearly frequency of core member meeting;

4 The purpose of the core member meeting;

Technology trainings;

Decisions regarding technology innovation;

Decisions regarding business strategy;

Decisions regarding the board's personnel issues;

Others. Please specify.

5 Please specify the general decision-making process in the cooperative.

E Income/profit allocation

1 Describe the cooperative's payment strategy of product procurement;

Average market price;

Higher than market price;

Lower than market price.

2 The share of profit that is retained as accumulation fund (%);

3 The share of distributable profit that is allocated based on equity capital (%);

4 The share of distributable profit that is allocated based on patronage (%).

F Information of the chairperson

1 Name of the chairperson;

2 Age of the chairperson;

3 Gender of the chairperson;

4 Telephone number of the chairperson;

5 The education level of the chairperson;

Lower than primary school;

Primary school;

High school;

Senior high school;

College and university;

Others.

6 The equity capital shares of the chairperson (%);

7 Other jobs that the chairperson is engaged in currently;

Being a technician of some governmental department;

Being a member of another cooperative;

Being a village head;

Selling agricultural input materials;

Working in a company;

Running a company or being a manager of some company;

Others. Please specify.

8 What had the chairperson ever done before being a cooperative member?

Farming;

Worked in some governmental department;

Been a village head;

Sold agricultural input materials;

Procured and sold agricultural products;

worked in a company;

Ran a company or been a manager of a company;

Others. Please specify.

9 The technological level of the chairperson;

Very bad;

Worse than average;

Medium;

Better than average;

Excellent.

Questionnaire in Chinese

A 基本信息：

1 合作社名称：

2 合作社所在县市：

3 合作社成立年份：

4 合作社成立时的社员数：

5 合作社当前社员数：

6 合作社成立时的固定资产：

7 合作社当前固定资产：

8 合作社成立时的股金总额：

9 合作社当前股金总额：

10 合作社当前总股份数：

11 合作社主营产品：

12 合作社生产总面积

13 合作社产品品牌：

14 合作社上一年度的总交易量：

15 合作社上一年度的总交易额：

B 合作社社员的社员资格

1 社员主要来自于：

（1）本村；（2）本镇；（3）本县；（4）本市；（5）本省；（6）全国各地

2 社员的生产基地主要分布在：

（1）本村；（2）本镇；（3）本县；（4）本市；（5）本省；（6）全国各地；（7）拥有国外基地

3 合作社的入社条件：

（1）开放性社员资格；

（2）限制性社员资格；

（3）封闭性社员资格。

4 若合作社采取开放性社员资格，采取这个政策的原因是：

5 若合作社采取限制性社员资格，那么农户入社需满足什么条件：

6 若合作社采取封闭性社员资格，采取这个政策的原因是：

7 请描述合作社社员的退社条件和程序（是否允许退社，退社条件，退社的返还股份计算等）。

C 理事会和监事会成员

1 理事会成员的人数：

2 理事会成员是否都为农户社员：（1）是；（2）否。

　　若否，则非社员的理事会成员人数是：

3 理事会成员所拥有的股份（%）：

4 监事会成员的人数：

5 监事会成员是否都为农户社员：（1）是；（2）否。

　　若否，则非社员的监事会成员人数是：

6 监事会成员所拥有的股份（%）：

D 决策机制和过程

1 合作社上一年度的社员大会次数：

2 合作社举行社员大会的目的：

（1）技术培训；

（2）关于技术创新的决策；

（3）关于市场策略的决策

（4）关于理事会和监事会成员人事变动的决策

（5）其他。请说明。

3 合作社上一年度的理事会次数：

4 合作社举行理事会的目的：

（1）技术培训；

（2）关于技术创新的决策；

（3）关于市场策略的决策

（4）关于理事会和监事会成员人事变动的决策

（5）其他。请说明。

5 请描述合作社所采取的基本决策程序。

E 利益分配机制

1 合作社对农户产品的定价原则：

（1）按市场价格支付；

（2）高于市场价格一定比例；

（3）低于市场价格收购。

2 合作社提取的公积金和公益金份额（%）：

3 合作社的可分配利润中按照股金分配的比例（%）：

4 合作社的可分配利润中按照交易量或交易额分配的比例（%）：

F 合作社社长/理事长信息

1 社长名字：

2 社长年龄：

3 社长性别：

4 社长电话：

5 社长教育程度：

（1）小学以下；

（2）小学毕业；

（3）初中毕业；

（4）高中毕业；

（5）大专或本科以上。

6 社长股金占合作社总股金的比例（%）：

7 社长目前所从事的其他工作：

（1）某些政府部门的技术人员；

（2）村长/村支书等村级干部；

（3）除了该合作社以外的其他合作社的成员；

（4）经营农资公司或商店；

（5）其他公司的普通员工；

（6）经营公司或是公司的管理人员；

（7）其他。请说明。

8 社长在成为社长之前的工作经历：

（1）从事农业生产；

（2）政府部门工作；

（3）村长/村支书等村级干部；

（4）经营农资公司或商店；

（5）从事农产品返销；

（6）其他公司的普通员工；

（7）经营公司或是公司的管理人员；

（8）其他。请说明。

9 社长的农业生产技术水平就全体社员来说，处于：

（1）很差；（2）中下；（3）中等；（4）中上；（5）前茅。

Appendix 2: Data (chapter 2)
Table A2-1. Genesis, main products, and geographical scope

Coops	Genesis	Main products	Geographical scope of members' production bases
1	2003	1	1
2	2003	1	2
3	2002	1	6
4	2003	1	6
5	2004	1	2
6	2004	1	3
7	2004	1,2	3
8	2003	1	2
9	2003	2	3
10	2002	1	3
11	2002	1,2	3
12	2002	1	2
13	2006	2	6
14	2002	1	4
15	2002	2	5
16	2003	1	3
17	2003	1	2
18	2002	1	2
19	2001	1	7
20	2005	1	2
21	2005	1	2
22	2005	1	3
23	2005	1	2
24	2002	1	1
25	2002	2	2
26	2003	2	1
27	2003	1	2
28	2004	1	3
29	2005	1	3
30	2004	1	2
31	2002	1	6
32	2003	2	3
33	2003	2	2
34	2005	1	3
35	2005	1	2
36	2006	1	1
37	2004	1	2

Notes: **Main products:** 1 fruits; 2 vegetables. **Geographical scope of members' production bases:** 1 within a local village; 2 within a local town; 3 within a local county; 4 within a local city; 5 within a local province; 6 nationwide; 7 international.

Table A2-2. Membership size and composition

Coops	Membership size	Geographical scope of the membership	No. of core members	Education level of chairpersons	Working experiences of chairpersons
1	132	1	5	3	2
2	46	2	3	3	3
3	173	3	9	3	2
4	250	2	5	3	4
5	108	2	8	2	1
6	103	3	4	3	2
7	135	3	3	4	4
8	103	2	3	2	4
9	103	2	3	2	1
10	705	3	5	5	3
11	100	2	5	4	1
12	108	1	4	3	2
13	120	2	3	3	3
14	132	2	5	4	2
15	1321	3	5	2	3
16	125	2	3	3	2
17	102	2	7	3	1
18	109	2	4	2	2
19	328	6	40	1	1
20	50	2	5	3	2
21	68	2	3	2	1
22	78	1	3	4	2
23	135	1	7	2	1
24	128	1	5	3	1
25	47	2	7	4	1
26	31	1	7	3	1
27	120	2	5	3	4
28	109	2	2	4	1
29	120	2	3	3	1
30	287	2	3	3	1
31	158	4	5	3	3
32	120	3	5	3	3
33	152	2	3	4	2
34	86	3	5	3	2
35	137	2	8	2	1
36	103	1	5	3	1
37	102	1	6	3	4

Notes: Geographical scope of the membership: 1 within a local village; 2 within a local town; 3 within a local county; 4 within a local city; 5 within a local province; 6 nationwide; 7 international. **Education level of chairpersons:** 1 below primary school; 2 primary school; 3 high school; 4 senior high school; 5 college and university; 6 others. **Working experiences of chairpersons:** 1 used to be a village head or worked in a governmental department; 2 did product transportation and sale; 3 ran a company; 4 a large farmer.

Appendix 3: Data (chapter 3)

Coops	Year of foundation	No. of members	No. of core members	No. of general membership meeting	No. of core members' meeting	Capital shares of core members	Capital shares of the chairperson	Voting rule[34]	Decision-making procedure	Percentage of retained profit	Profit distribution strategy	
1	2003	132	5	1	3	53	14	1	2	18	3	
2	2003	46	3	2	6	43	19	2	2	4	3	
3	2002	173	9	2	6	50	9.5	2	2	30	3	
4	2003	250	5	3	12	65.8	18.2	2	2	30	3	
5	2004	108	8	2	6	97.45	18	1	1	30	3	
6	2004	103	4	3	4	65	19.8	2	2	30	3	
7	2004	135	3	4	8	20	10	1	2	30	3	
8	2003	103	3	3	8	60	19.8	2	2	30	3	
9	2003	103	3	4	6	30	15	1	2	30	1	
10	2002	705	5	1	2	29.48	13.9	2	2	30	3	
11	2002	100	5	2	4	30	15	2	2	30	3	
12	2002	108	4	2	4	40	10	1	2	30	3	
13	2006	120	3	3	7	51.6	19	1	2	30	3	
14	2002	132	5	2	10	48.2	16.67	1	2	30	3	
15	2002	1321	5	3	3	66	14	1	2	11	3	
16	2003	125	3	2	6	30	10	1	2	30	3	
17	2003	102	7	1	2	50	20	1	2	13	1	
18	2002	109	4	2	3	41	17.7	1	2	20	1	
19	2001	328	40	8	2	60	2	2	2	6	2	
20	2005	50	5	2	4	49	2	2	2	30	2	
21	2005	68	3	1	2	60	20	1	2	0	1	
22	2005	78	3	3	5	30	7.6	1	2	30	3	
23	2005	135	7	3	8	70	16	1	1	30	1	
24	2002	128	5	2	4	42	19	1	2	25	3	
25	2002	47	7	2	5	21	5	1	2	25	1	
26	2003	31	7	1	4	45	19	1	2	30	1	
27	2003	120	5	3	5	50	20	1	2	30	3	

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[34] Here the voting rule refers to the voting rule of general membership meetings.

Coops	Year of foundation	No. of members	No. of core members	No. of general membership meeting	No. of core members' meeting	Capital shares of core members	Capital shares of the chairperson	Voting rule[34]	Decision-making procedure	Percentage of retained profit	Profit distribution strategy	
28	2004	109	2	1	3	26.9	20	1	2	30	3	
29	2005	120	3	5	3	50	20	2	2	30	3	
30	2004	287	3	4	3	45	20	1	2	30	3	
31	2002	158	5	1	4	57	19	1	2	30	3	
32	2003	120	5	2	5	53.1	16	1	2	25	1	
33	2003	152	3	10	10	35	19	1	2	30	3	
34	2005	86	5	2	4	38	12	2	2	23	3	
35	2005	137	8	12	12	80	20	2	2	30	3	
36	2006	103	5	6	5	95	19	2	2	10	3	
37	2004	102	6	3	10	40	20	2	1	0	3	

Notes:

Geographical scope of the membership: 1 within a local village; 2 within a local town; 3 within a local county; 4 within a loca nationwide.

Geographical scope of members' production bases: 1 within a local village; 2 within a local town; 3 within a local county; 4 w province; 6 nationwide; 7 international.

Voting rule of the general membership meetings: 1 one member, one vote; 2 proportional voting.

Decision-making procedure: 1 membership voting; 2 core members decide.

Experiences of chairpersons: 1 used to be a village head or worked in a governmental department; 2 did product transportatio large farmer.

Education level of chairpersons: 1 under primary school; 2 primary school; 3 high school; 4 senior high school; 5 college and un

Profit distribution strategy: 1 based on patronage; 2 based on equity capital; 3 based on both patronage and equity capital.

Abstract (English)

Governance structure specifies the allocation of ownership rights, decision rights, and income rights. A cooperative is characterized by user ownership, user control, and user benefits. The focus of this thesis is on various governance structure characteristics and the efficiency of farmer cooperatives. Special attention is dedicated to cooperatives in China.

The thesis consists of six chapters. **Chapter 1** outlines the structure of the thesis and provides an overview of farmer cooperatives in China, especially in terms of the history, the modes, and organization characteristics. The genesis of farmer cooperatives in China is described in **chapter 2**. **Chapter 3** delineates the governance structure of Chinese farmer cooperatives in terms of the allocation of ownership rights, decision rights, and income rights within the membership. A principal-agent model is developed in **chapter 4** to explore the efficiency of cooperatives with different CEO identities, member CEO or outside CEO. **Chapter 5** examines how farmers producing differentiated quality products choose different governance structures in a non-cooperative game. Besides, the impact of the cooperatives' presence in the market on the welfare of various stakeholders is analyzed. We conclude in **chapter 6**.

The main conclusions are as follows. **Firstly**, the genesis of farmer cooperatives in China is mainly due to entrepreneurial farmers and the government rather than a bottom-up, collective action process of many small farmers in the West. **Secondly**, the allocation of ownership rights, decision rights, and income rights is quite skewed towards core members in cooperatives in China. These cooperatives may seem to be hampered by their skewed allocation of ownership rights, but there are many possibilities for structuring the bylaws, in terms of decision and income rights, in order to protect common members. **Thirdly**, the efficiency of cooperatives with different CEO identities depends on the interaction between the upstream farming task and the downstream value-adding task as well as the productivity difference between the two tasks. A cooperative with a member as CEO is uniquely efficient when upstream and downstream tasks are substitutes to a certain extent, or complements. The scope of a cooperative with a member CEO being efficient becomes smaller when the substitution effect is at an intermediate level or the productivity difference between the two tasks is limited. **Fourth**, the quality provision of cooperatives depends on the payment for quality. There is a positive relationship between the market share of cooperatives and the price received by farmers. In addition, a larger degree of differentiation regarding the cooperative's payment has a stronger yardstick effect.

Abstract (Dutch)

Een beheersstructuur specificeert de toewijzing van eigendomsrechten, beslissingsrechten en inkomstenrechten. In land- en tuinbouwcoöperaties zijn deze rechten toegewezen aan de toeleverancier of de afnemer. Dit proefschrift is gericht op diverse beheersstructuur karakteristieken van land- en tuinbouwcoöperaties en de efficiëntie van deze ondernemingen. Bijzondere aandacht gaat uit naar coöperaties in China.

Het proefschrift bestaat uit zes hoofdstukken. Hoofdstuk 1 schetst de structuur van het proefschrift en geeft een overzicht van land- en tuinbouwcoöperaties in China, in het bijzonder de geschiedenis, de verschijningsvormen, en de organisatiekenmerken. Het ontstaan van vele nieuwe land- en tuinbouwcoöperaties in China in de laatste 10 jaar wordt beschreven in hoofdstuk 2. Hoofdstuk 3 gaat in op de beheersstructuur van Chinese land- en tuinbouwcoöperaties. Een principaal-agent model is ontwikkeld in hoofdstuk 4 om de efficiëntie te bepalen van coöperaties met een lid als CEO en coöperaties met een buitenstaander als CEO. Hoofdstuk 5 onderzoekt hoe boeren met producten van verschillende kwaliteit verschillende beheersstructuren kiezen. Bovendien wordt het effect van de aanwezigheid van coöperaties in de markt op het welzijn van de diverse partijen in de markt geanalyseerd. Hoofdstuk 6 sluit af.

De belangrijkste conclusies zijn als volgt. Ten eerste is het ontstaan van boerencoöperaties in China vooral toe te schrijven aan ondernemende boeren en de overheid. In Westerse landen is veeleer sprake geweest van vele kleine boeren die zich gezamenlijk organiseerden. Ten tweede is de toewijzing van eigendomsrechten, beslissingsrechten en inkomstenrechten erg scheef verdeelt ten gunste van kernleden in coöperaties in China. Hierdoor zouden deze coöperaties gehinderd kunnen worden in hun ontwikkeling. Er zijn echter vele mogelijkheden voor het structureren van de statuten, op het gebied van besluitvorming en inkomensrechten, om alle leden te beschermen. Ten derde, de doeltreffendheid van een coöperatie met een specifieke CEO identiteit hangt af van de interactie tussen de activiteiten op het boerenbedrijf en de activiteiten in de coöperatieve onderneming, en het productiviteitsverschil tussen deze activiteiten. Een coöperatie met een lid als CEO is efficiënt wanneer de activiteiten tot op zekere hoogte substituten zijn, of elkaar aanvullen. De mogelijkheden voor een coöperatie met een lid als CEO om efficiënt te zijn worden kleiner naarmate het substitutie effect zich op een tussenliggend niveau bevindt of het productiviteitsverschil tussen de twee activiteiten beperkt is. Ten vierde, de kwaliteit van de geleverde producten door de coöperatie is afhankelijk van de betaling voor kwaliteit. Er bestaat een positieve relatie

tussen het marktaandeel van coöperaties en de prijs die de boeren ontvangen. Daarnaast zijn de prijzen in de markt hoger wanneer er sprake is van meer differentiatie in de betaling voor kwaliteit in de coöperatie.

Abstract (Chinese)

治理结构阐述了关于所有权、决策权和收益权结构的分配。合作社是一种社员所有、社员控制和社员受益的治理结构。该论文主要分析了合作社的发生机制、内部治理、组织效率和质量供给等问题，其中中国合作社是本文的关注点之一。

本论文由六章构成。第一章介绍了本论文的结构，并简要介绍了中国农民合作社，包括其发展历史、发展模式和治理特点等；第二章基于中国浙江省 37 家果蔬合作社的一手资料，描述中国农民合作社产生过程中各利益相关者的行为，解读中国合作社的发生机制；第三章利用中国浙江省 37 家果蔬合作社的数据，从所有权、决策权和收益权结构的角度阐述了中国农民合作社的治理结构特点；第四章建立了一个委托-代理模型，探索不同的 CEO 身份（社员 CEO 和外聘 CEO）是否会影响合作社的效率；第五章通过一个博弈模型分析了产品质量差异化的农户对治理结构（合作社和投资者所有企业）的选择，并衡量了合作社在市场中的存在是否对农户及其他市场主体的福利产生影响以及影响程度；第六章对全文进行总结。

本论文的主要结论总结如下。首先，就利益相关者行为来说，中国合作社的产生主要归功于农民/合作社企业家的创业精神和政府的推动，大体上有异于西方合作社的由下而上的集体行动过程。其次，中国合作社中的所有权、决策权和收益权分配具有明显的核心社员占主体的倾向；尽管合作社具有全体社员集体所有的特性，但是仍能够通过决策权和收益权结构的自由度实现组织效率。第三，CEO 身份对合作社效率的影响主要取决于上游生产活动和下游增值活动之间的相互作用及其边际效益的差别。当上下游活动之间 1）存在互补性或 2）替代性为中等水平，同时生产和增值活动的边际效益差别较小时，外部 CEO 是有效的；反之，社员 CEO 更加有效。第四，生产者对治理结构的选择主要取决于合作社的价格机制。当合作社采取完全混合制，即对质量差异性社员支付相同价格时，只有产品质量最低的生产者选择合作社，其他高质量产品的生产者更倾向于选择投资者所有企业；合作社对社员产品的差异化定价将会激励高质量生产者的加入；模型证实了合作社在市场中的存在能够产生市场竞争标尺效应；随着合作社采取的定价差异化程度的提高，合作社的市场竞争标尺效应的也相应提高；此外，随着合作社市场份额的提高，这种竞争标尺效应也会随之增加。

Academic Curriculum Vitae

Qiao Liang was born in March, 1983 in Zhejiang, China. She received her bachelor and PhD degrees from School of Management, Zhejiang University. She finished the PhD in Zhejiang University in March 2011.

In November, 2008, Qiao Liang started working as a PhD candidate with George Hendrikse in the Department of Organization and Personnel Management, Rotterdam School of Management, Erasmus University. Now she is also a post doctor working in School of Economics, Zhejiang University, China.

Her research interests are agricultural chains and organizations, with a special interest in cooperatives. Her work has been published in *Managerial and Decision Economics* and *Agribusiness*, and also in books and first-class Chinese Journals, such as Economist and Agricultural Economics Issue. She has presented her work at various international conferences and seminars, such as the EAAE (European Association of Agricultural Economics) seminar, EMNet (Economics and Management of Networks) Conference, eRNAC (e-Research Network for Agricultural Cooperatives) Conference, and so on.

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GOVERNANCE, CEO IDENTITY, AND QUALITY PROVISION OF FARMER COOPERATIVES

Governance structure specifies the allocation of ownership rights, decision rights, and income rights. A cooperative is characterized by collective ownership, democratic control, and member benefits. This thesis empirically delineates the genesis and the governance structure characteristics of farmer cooperatives in China and theoretically examines the efficiency of cooperatives with different CEO identities and quality provision of cooperatives.

The main conclusions are as follows. *First*, the genesis of farmer cooperatives in China is mainly due to entrepreneurial farmers and the government rather than a bottom-up, collective action process of many small farmers. *Second*, the allocation of ownership rights, decision rights, and income rights is quite skewed towards core members in cooperatives in China. *Third*, the efficiency of cooperatives with different CEO identities depends on the interaction between upstream farming task and downstream value-adding task as well as the productivity difference between the two tasks. *Fourth*, the quality provision of cooperatives is dependent crucially on the payment treatment of members regarding quality within the cooperatives. The presence of cooperatives in food market has a competitive yardstick. A larger degree of differentiation in the payment and a larger market share of a cooperative indicate stronger yardstick effect.

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