

**Value added efficiency and governance structure:
Evidence from the pear industry in China's Zhejiang province**

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Abstract

A traditional farmer cooperative, a new generation farmer cooperative, and an investor-owned firm (IOF), are compared regarding their value added efficiency. The results of the case analysis regarding the pear supply chain in Zhejiang province in China indicate that the IOF has a higher value added efficiency than those of the farmer cooperatives. New generation cooperatives gain a larger share of the value added than traditional cooperatives. However, farmer cooperatives have several advantages over general firms in helping farmers.

Key words: Farmer cooperatives, Investor-owned firm, Value added.

1. Introduction

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Due to intensified market competition and the rising of supermarkets in the supply chain, it is becoming more difficult for small farmers to in China negotiate with others (Hu and Reardon, 2004). Farmers often gain a limited share of the value added of the entire chain. There are imbalances between sellers and buyers regarding the distribution of benefits and risk sharing in the product value chain. Farmers receive hardly a reasonable share compared to the risk they shoulder, due to their weak bargaining position. Responding to the perceived imbalance, organizations with different governance structures were established to support small farmers. Stockbridge (2003) proposes that a farmer organization is an obvious candidate for solving the problems that farmers are faced with.

There is a substantial literature about the benefits and necessities of the development of organizations that help farmers to face large markets. Following the World Development Report (2002), “producers’ organizations amplify the political voice of smallholder producers, reduce the costs of marketing of input and outputs, and...create opportunities for producers to get more involved in value-adding activities”. Zusman and Rausser (1994) point out that under market failure, collective action yields efficiency improvements over uncoordinated private action. However, Stockbridge (2003) concludes that the transaction costs of doing business with third parties are replaced in part by the transaction costs of organizing themselves together. Jonathan (1999) observes that farmer cooperatives, farmer associations and contracts with private agri-business companies all provide farmers with access to markets.

Farmer cooperatives and investor-owned firms are the two most common

organizations that closely relate to farmers. This paper focuses on the objectives and the residual claims of the two organizations. An investor-owned firm is characterized by the objective of pursuing benefits maximization of the shareholders or investors holding the residual claims, while a cooperative is defined as an association of persons joining together to achieve a common objective (both profit related and non-profit related), and have both a transaction and ownership relationship with the organization.

There is a lot of literature regarding the comparison between these two forms of governance structures. Albaek and Scholtz (1998) develop a model of competition between a cooperative and an IOF, and show that the members of the cooperative will earn more than the vertically integrated profit per farmer generated in the IOF. Hendrikse (1998) constructs a screening model to determine the conditions and circumstances under which the cooperatives or the IOFs will be preferred or coexist. Karantininis and Zago (2001) model the decision of farmers to join the cooperative versus the IOF. One of their conclusions is that inefficient producers tend to choose the cooperative instead of the IOF. Lacking from all these analyses is a value added efficiency differential between cooperatives and IOFs. All the above mentioned researches are prone to explain how farmers decide or choose between the alternative organizations and/or under different conditions. What we are interested to exploit is if there are endogenous differences in value added efficiency due to different governance structures.

As a governance structure is formed to help farmers in markets, one of the most

important prerequisites should be that it can gain a larger share of value in the chain. A strong connection between the value added efficiency and the existence or development of governance structure is seen, due to farmers' decision to join a cooperative or transact with an IOF must be based mainly on economic terms (Karantininis and Zago 2001).

We investigate the claim that there are significant differences in the value added efficiencies of products between these different structures, as well as the shares of the benefits that farmers gain. The main objectives of the study are to

- 1) identify the differences in the value added efficiencies between IOF, traditional cooperative and new generation cooperative.
- 2) determine the key factors helping farmers to decide to participate in a cooperative while there are alternative organizations.
- 3) address what can be done to help farmers to gain a larger share of the value added in the chain.

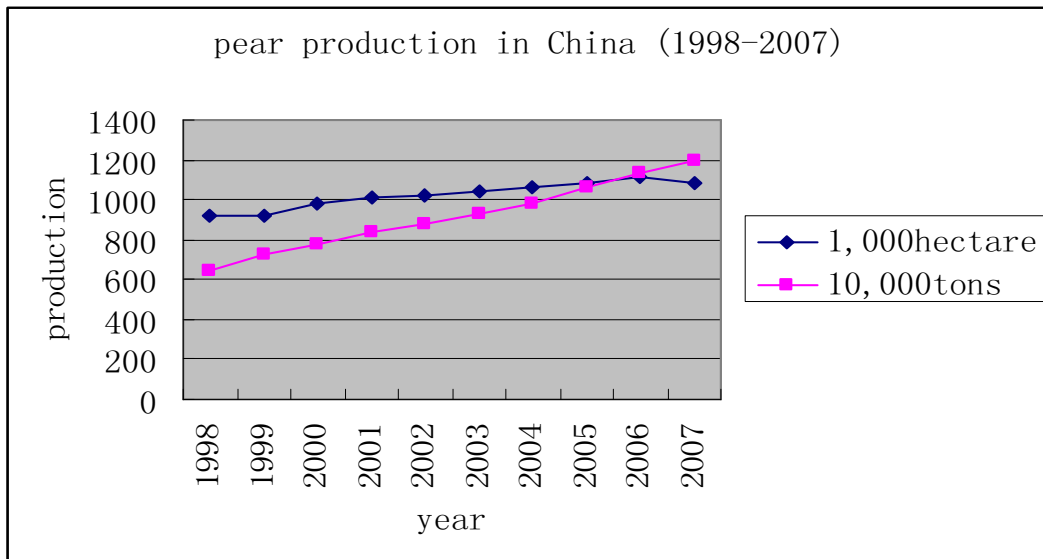
The article is organized as follows. Section 2 describes the pear production in China. Section 3 reviews the literature, compares the three governance structures, and formulates propositions. Section 4 is dedicated to methodology. Cases and data are described and analyzed in detail in section 5. Finally, conclusions and recommendations for further research are formulated in section 6.

2 Pear productions in China

In order to control for differences in production cost, marketing cost and prices, one product market is selected. Pear is selected as a case product. Pear is a main fruit

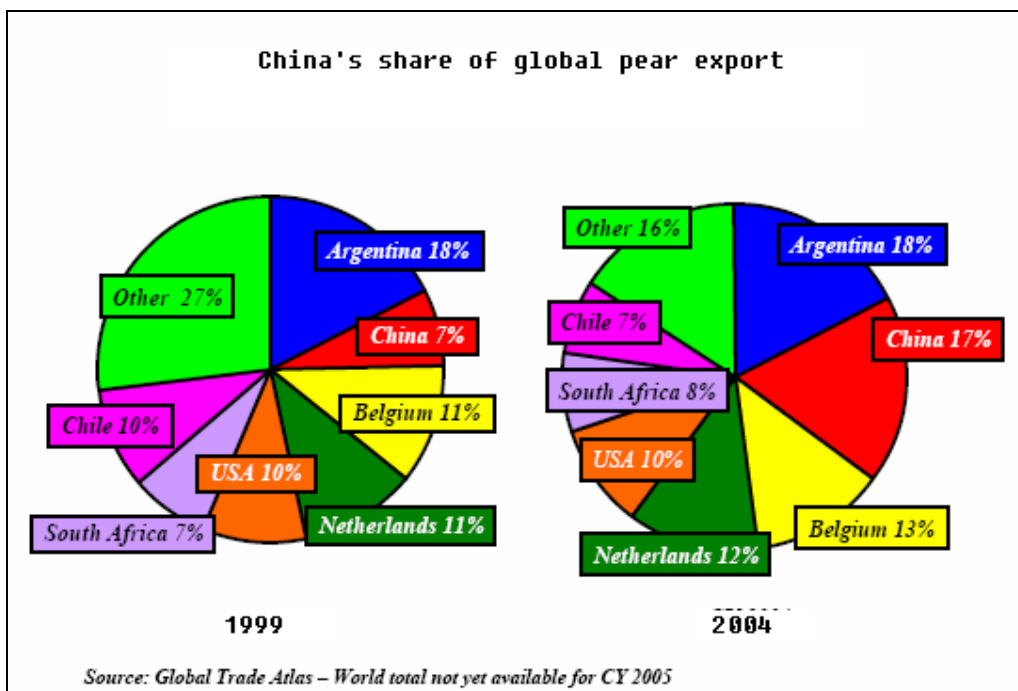
in China, whose production is ranked third following apple and citrus (Gemma, 2002). Pears for fresh consumption in China account for more than 90% of the national production, while those for processing account for less than 10% (Saito, 2005). China is the largest pear producer in the world. Expansion in pear production is due to a combination of high profitability, increasing consumer demand, and improvement in technology (Gemma, 2002). We can see fast growth in pear production in China from Figure 1 and markets share expansion in global pear export in Figure 2.

Figure 1. Pear production in China from 1998 to 2007



Data source: China Agriculture Statistical Yearbook (1999-2008)

Figure 2. Shares of global pear export in 1999 and 2004



Zhejiang province was selected as the case province mainly due to two reasons. The first is that Zhejiang is one of the main provinces of pear production. Zhejiang province is not famous for the big yield of pear (see the yields and areas of pear production of Zhejiang in table 1), but for the relative advantage on variety, technique and market. Zhejiang has a pear variety of high quality and high technique level. Besides, Zhejiang is one of the provinces with most developed markets as well as economy.

Table 1. Pear production in Zhejiang province from 2003 to 2007

Item/year	2003	2004	2005	2006	2007
Area (1,000 hectare)	22.1	24.1	25.7	26.6	26.5
Yield (ton)	202,200	244,454	285,751	310,375	329,753

Data source: China Agriculture Statistical Yearbook (2004-2008)

The second reason is that Zhejiang province is leading in China regarding the development of both farmer cooperatives and other agricultural organizations such as

investor owned firms. It is the province with the largest quantity and the most developed level of farmer organizations. The coexistence of the two governance structures provides the possibility for a comparison between these organizations, in order to determine which governance structure obtains the larger share of the value added in the pear value chain, i.e. which organization form has a higher efficiency relating to cost added and value added of pears. Additionally, are there any specific factors that affect farmers' choices to participate or not while there are alternative organizations?

3 Theoretical framework

Some concepts used in this article (value chain, governance structures, and two types of farmer cooperatives) are explained in this section and a proposition is formulated based on a review.

The value chain is a model that describes a series of value-adding activities (Rayport and Sviokla, 1996). The value of the product, as well as the cost, is being accumulated in the process of production, transporting, packaging, processing, marketing and consumption. We define the cost added as the expense that one (either an individual or an organization) spends in the process from material (product) purchasing to product sale. In the same sense, value added is recognized as the added value in the process from material (product) purchasing to product sale. For instance, the cost added of a purely marketing (without production or processing) IOF is the expense related to all the material input cost and labor input cost of purchasing, packing, storing, transportation, marketing, negotiation and taxes, etc. In contrast, the

value added of such a purely marketing IOF is the value differential between purchasing price and sale price.

Each stage of the chain, starting from farmers to different channels such as wholesalers, retail stores, cooperatives, investor-owned firms and supermarkets, etc, places different costs added and captures a different value added. Various articles point out that the development of organizational governance structures may help farmers to capture a larger share of the value added (Liu, 2004; Huang, 2005).

A governance structure specifies on the one hand who formally holds the decisions rights and on the other hand the way in which revenues and costs are distributed in terms of income rights (Hansmann, 1996). In other words, an organization is characterized by authority and residual claims. Nowadays in China, there are two forms of governance structures closely related to product marketing in rural areas, namely a farmer cooperative and an agricultural firm (investor-owned firm). The shareholders are the owners of an investor-owned firm, while all the members are the owners of a cooperative. The distinction between a shareholder and a member is that a shareholder provides only capital to the enterprise, whereas a member provides capital as well as inputs to the enterprise.

The issue of economy effectiveness or value added efficiency regarding various governance structures or different ownership structures is studied by Albaek and Scholtz (1998), Hendrikse (1998), Chaddad and Cook (2002), and Cook and Chaddad (2004), etc.

Chaddad and Cook (2002) propose a typology of organizational models, in

which the traditional cooperative structure and the IOF are characterized as polar forms, and the new generation cooperative is deemed as a structure in between. They define the ownership rights as being comprised of residual claims and residual control rights. Herein residual claims are defined as the rights to the net income generated by the firm. Residual control rights are defined as the rights to make any decisions regarding an asset's use that are not explicitly attenuated by law or contract (Grossman and Hart, 1986). Characteristics of the residual claim rights distinguish organizational forms from one another (Fama and Jensen, 1983a, b). Shareholders of a firm hold the residual claim rights, while all the members of a cooperative are in charge of the residual claim rights.

Farmer cooperatives can be distinguished into two main types: traditional cooperatives and new generation cooperatives. Cook and Iliopoulos (1999) characterize a traditional agricultural cooperative by open membership, growth capital primarily generated from patronage, illiquid ownership rights, residual claims between active and inactive members, and a one member one vote principle. Katz and Boland (2002) characterize a new generation cooperative by closed membership and a delivery requirement (which must be delivered under threat of sanctioning if members do not fulfill their obligation).

This classification matches well with the realities in China. Nowadays in China there are both traditional ones and new generation ones. In this research, a traditional cooperative is associated with one organizing farmers to produce and market in a relatively loose way, while a new generation cooperative organizes farmers in a much

tighter way, such as contract purchasing.

According to Chaddad and Cook (2002) argument, ownership structure has an effect on organizational efficiency. The characteristics of a traditional cooperative, described as open membership, vaguely defined ownership rights, defensive purposes and residual right of control based on one member, one vote, lead to underinvestment and inefficiency (Cook and Iliopoulos, 2000). The open membership leads to the free-rider problem and the horizon problem, i.e. members can capture benefits from their investment only over the horizons of their expected membership, which causes short-term investment and/or underinvestment (Valentinov, 2007). If property rights are not clearly defined or not secure, then owners will not invest great amounts in assets that they may lose with no compensation (Milgrom and Roberts, 1992). Cooperatives are firstly found to act collectively for defensive purposes - to depressed prices and/or market failure (Cook and Iliopoulos, 2000), which implies a passive attitude towards investment.

Alternatively, a new generation cooperative is organized due to a more offensive attitude towards adding value to their assets (Cook and Chaddad, 2004). Cook and Iliopoulos (2000) consider new generation cooperatives as being more interested in extracting rents from value added activities up- and down-stream in the food chain. They also predict that the clearly defined membership cooperatives with transferable and appreciable residual claims enhance members' incentives to invest and return on investment, which probably brings about higher product quality and higher product prices.

Here we conclude with the first proposition.

Proposition 1: Members of traditional cooperatives tend to under-invest in production and marketing activities, compared with those of new generation cooperatives.

Chaddad and Cook (2002) consider IOF to be the most efficient form of organization, taking into consideration the difficulty in assets valuation. They deemed IOF as a demutualized form of cooperatives. As a result of demutualization, residual claim and control rights are reassigned among the firm's stakeholders. This reassignment brings high efficiency due to focused assets shares and focused achieving goals. Herbst and Prufer (2007) argue that cooperatives will be preferable when the cost of collectively decision making is sufficiently low, while firms are optimal when there is tough competition as well as higher costs of collective decision making. Porter and Scully (1987) employ the frontier production function to assess scale, price, and technical efficiency differences between farmer cooperatives and non-cooperative firms and find that the non-cooperative firms dominate in efficiencies over cooperatives. Whereas the model of Herbst and Prufer (2008) argue that the efficiency of different organizations depends on the competitive environment and the decision making cost. Their model shows that a cooperative usually is the most efficient form when there is sufficiently low cost of collective decision making. Yet, firms are preferable to cooperatives as soon as decision making cost rises to an extent. In conclusion, they consider IOF to be an optimal organizational response to tougher competition and more costly internal decision-making process. Following these

former statements, a higher efficiency of IOF is predicted due to the heightened competition in markets.

Conclude from these above stated research, an increment of economic efficiency is implied, ranging from traditional cooperative, new generation cooperative, to investor-owned firm, which forms the second proposition.

Proposition 2: There is an increment in value added efficiency of organizations of different governance structures, ranging from traditional cooperative, new generation cooperative, to investor-owned firm.

4. Methods

This section introduces measurement and establishes a model of data analysis (4.1). Then research strategy (4.2) and methods of cases selection and data collection (4.3) are addressed. Subsequently, hypotheses are formulated based on propositions and measurement (4.4). Finally, cases or instances chosen are described (4.5).

4.1 Measurement and a value added model

The purchase prices of products are viewed as the original value of products. Costs added of products occur when there are activities like transportation, packing, processing and marketing. Value added is greater than zero if the sale price is higher than the purchase price or production cost.

Assume that there are three types of governance structures of farmers' product outlet in markets, namely a traditional cooperative, a new generation cooperative, and an investor-owned firm, being referred to as coop1, coop 2, and the IOF from now on.

Buyers are assumed to have no preference in choosing transaction parties, which implies a perfectly competitive market. Define profit function of the three organizations as π_1 , π_2 , π_3 respectively. c_i ($i=1, 2, 3$) denotes the raw material product cost, a_i ($i=1, 2, 3$) denotes the cost added before sale, and p_i ($i=1, 2, 3$) denotes the marketing or sale price of processed product of the three organizations, ranging as coop1, coop2, and the IOF. Suppose that there is no deep processing in either of the organization, except for first-stage process like grading and packing, which is the actual situation of pear investigated. For the IOF, p_3 is the sale price and c_3 is the purchasing price offered to farmers. As a cooperative is viewed as an organization owned by farmers, the costs and profits of a cooperative are regarded as the joint costs and profits of all the members. Thus for the two cooperatives, p_i ($i=1, 2$) is the sale price and c_i ($i=1, 2$) is the production cost of members' products. The profit function of each product will be:

$$\pi_i = p_i - c_i - a_i, i=1, 2, 3.$$

Let v_i^s and ρ_i^s be the general value added and general value added efficiency, while v_i^n and ρ_i^n be the net value added and value added efficiency.

$$\text{Then } \rho_i^s = \frac{p_i - c_i}{c_i}$$

$$\text{And } \rho_i^n = \frac{\pi_i}{c_i} = \frac{p_i - c_i - a_i}{c_i}$$

4.2 Research strategy

Case study research is considered as a useful research strategy when there is not a lot of related theory available or when it is used with exploratory aims (Dul and

Hark, 2008; Voss, 2002). It is actually a survey of small population. We try to test the proposition in an exploratory way by investigating relatively detailed aspects of cases. According to the assumption that the cases should be representative of the population, there are three kinds of sampling, namely random sampling, stratified sampling and theoretical sampling (Voss, 2002). Stratified sampling is more preferable if there is a limited number of cases and if there are specific types of populations. In our research the stratified sampling method was adopted to select the cooperatives and the firm.

4.3 Case selection

As introduced in section 2, we focus population of the study on organizations of various governance structures related to pear production and/marketing in Zhejiang province, China. There are two rounds of case selection, in order to ensure the representativeness of selected cases. Firstly, four pear farmer cooperatives and two investor-owned firms were recommended by Provincial Agricultural Department of Zhejiang based on consideration of types and representativeness, choosing from the present organizations at Annual Pear Quality Appraisal in 2007 which was hosted by the government of Zhejiang province. Semi-structure interviews were conducted, using a questionnaire that covered all the basic information, such as data regarding costs, prices and sale channels of the case organizations. Semi-structure interview is chosen out of structured, semi-structured and unstructured interview because of its advantages in enabling interviewees to probe deeply, to solicit expansive responses, and thereby uncover previously hidden detail (Burgess, 1982). Subsequently, based on the different developing histories, scales, and modes, etc, an IOF (DFD company), a

traditional cooperative (ZS cooperative) and a new generation cooperative (NNS cooperative) were chosen out of the four cooperatives and two IOFs as our target cases. All the three organizations can well reflect and stand for real situations and types of existing farmer related organizations. Finally, several random unstructured interviews were done with farmers who deliver products through or to the three selected case organizations, to ensure or test the information authenticity of first-hand data related to the case organizations.

4.4 Hypotheses

Based on the first proposition that members of traditional cooperatives tend to under-invest in production and marketing activities, compared with those of new generation cooperatives, and measurements, hypotheses are formulated.

Hypothesis 1: The traditional pear cooperative (coop1) tends to under-invest in production, compared with the new generation cooperative (coop2), i.e. $c_1 < c_2$.

Hypothesis 2: The traditional pear cooperative (coop1) tends to under-invest in processing, compared with the new generation cooperative (coop2), i.e. $a_1 < a_2$.

As to the second proposition, i.e. there is an increment in value added efficiency of organizations of different governance structures, ranging from traditional cooperative, new generation cooperative, to investor-owned firm, hypotheses are explicit.

Hypothesis 3: The investor-owned firm has highest value added efficiency, followed by the new generation cooperative, and the traditional cooperative is of the lowest value added efficiency, i.e. $v_3^g > v_2^g > v_1^g$ or $v_3^n > v_2^n > v_1^n$.

4.5 Case description and data presentation

Details of the three organizations are presented case by case in this part.

(1) ZS pear specialized cooperative (traditional cooperative)

Interviewee: Manager Chen

ZS pear cooperative was established in 2002 by 10 pear farmers, with a registered capital of RMB 500,000 and set assets of RMB 1,200,000. The number of its members reached 104 in 2007. ZS cooperative supplies inputs for all the members at wholesale prices. The cooperative purchases pears of all the local farmers, but with a priority to members. The cooperative graded pears and those not meeting the grading standard would be rejected. ZS cooperative sold pears in four channels, namely group consumption, supermarkets, wholesale market and peddlers coming to the cooperative. The sale proportions of the above-mentioned channels were 60%, 8%, 10% and 22% separately. The cooperative's total purchasing volume of pears from farmers was 1000 tons at an average price of RMB1.5 per kg. The data is summarized in Table 3.

Table 2. Costs and values of coop 1 (For particular lists, see Appendix 1)

Items	Production Cost	Cost added	Sale price	Net profit	General value added rate	Net value added rate
	c_1	a_1	p_1	π_i	$v_1^g = \frac{p_1 - c_1}{c_1}$	$v_1^n = \frac{\pi_1}{c_1}$
Value	1.328	0.202	1.5	-0.030 ⁴	0.130	-0.023

(2) NNS pear specialized cooperative (new generation cooperative)

⁴ Although the net profit is minus, farmers still gain some profits because labor costs of farmers themselves are included in the production costs.

Interviewee: Manager Zhou

NNS cooperative was established by 10 farmers or shareholders in 2004 with a registered capital of RMB 520,000. Now it has 13 core members and 108 common members. Farmers who want to join the cooperative have to pay for the shares. NNS cooperative carried out production standards according to which all the pears of members were produced. The cooperative also purchased inputs for members at relatively lower prices. Besides, technique instructions and trainings were provided to members by technique able men or specialist from government departments or universities invited by the cooperative. NNS cooperative signs purchasing and sale contracts with members before harvest time. 60,000kg pears were contracted. Set production standards, prices, brands and packages were contained in the contracts.

Table 3. Costs and values of coop 2 (For particular lists, see Appendix 2)

Items	Production Cost	Cost added	Sale price	Net profit	General value added rate	Net value added rate
	c_2	a_2	p_2	π_2	$v_2^g = \frac{p_2 - c_2}{c_2}$	$v_2^n = \frac{\pi_2}{c_2}$
Value	3.838	1.313	7.6	2.449	0.980	0.638

(3) DFD firm (IOF)

Interviewee: General Manager Xu

DFD firm was established in April, 2003 by five shareholders, with a registered capital of RMB 3,000,000 and permanent assets of RMB 8,700,000. Now DFD has an pear orchard of 4 hectare. Besides, the firm purchases pears from farmers of Local County in June, July and August. The pear yield of DFD in 2007 was 225 tons while

the purchase volume is 650 tons, which means that the total sale volume in 2007 was 875 tons. The sale channels were described as: group consumption (80%), and supermarkets (20%). All the costs and benefits of pear production, purchasing and sale are listed in Table 4.

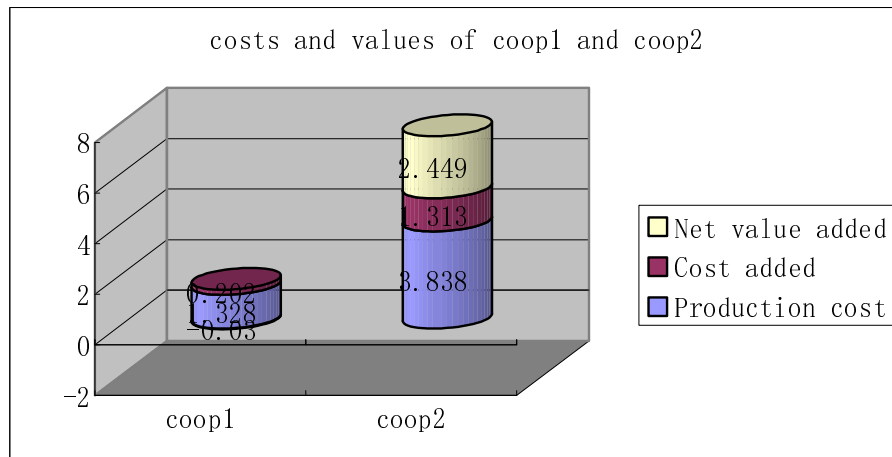
Table 4: Costs and values of the IOF

Items	Production Cost	Cost added	Sale price	Net profit	General value added rate	Net value added rate
	c_3	a_3	p_3	π_3	$v_3^g = \frac{p_3 - c_3}{c_3}$	$v_3^n = \frac{\pi_3}{c_3}$
Value	2.142	1.558	6.960	3.260	2.249	1.522

5. Results

Comparisons between the production investments, marketing investments, and net values added of the two cooperatives are displayed in Figure 3.

Figure 3. Production costs, costs added, and values added of the two coops



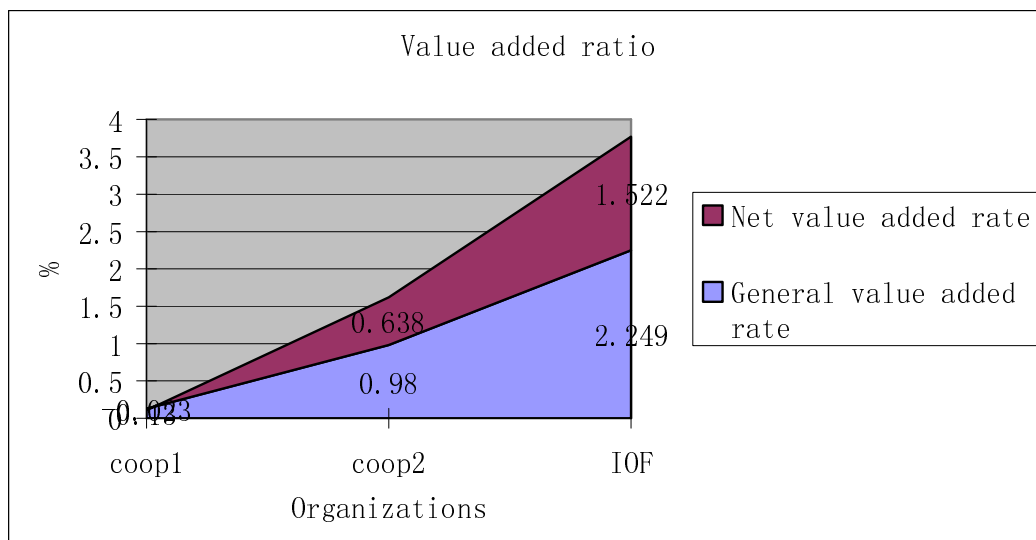
We see clearly from Figure 3 that coop2 (new generation cooperative) has obviously higher level production investment and marketing investment than coop1

(traditional cooperative). Pears of the two cooperatives are of different qualities and packages, which imply the different investment levels of production and marketing between the two types of cooperatives. The big differences in investments lead to pear quality differentia and sequentially to the totally different levels of value added. Pears of coop2 are produced strictly according to specific standards in the supervision of the cooperative, while pears of coop1 are produced in common standards without especially strict supervision from the cooperative. Coop2 signs contracts with members with fixed items of product standards, prices and delivery volume.

Now we can conclude that the first and second hypotheses are confirmed, i.e. the traditional cooperative tends to under-investment in both production and marketing, while the new generation cooperative contributes more to the quality of pear product to gain higher prices or value added.

Figure 4 denotes to the value added, both general and net, of the three types of organizations.

Figure 4. Value added of the three organizations



The ascending in both general value added rate and net value added rate ranging from coop1, coop2, to the IOF, strongly confirmed the third hypothesis that the investor-owned firm and the traditional cooperative rank at the top spectrum and bottom spectrum respectively, and the new generation in the middle, with respect to value added efficiency. The value added of pears has a lot to do with the sale channels. As far as we know from the interviews, pears supplied to group consumption are generally of higher prices than those sold to either wholesaler or retailing stores. Another factor that contributes to the higher value added of the IOF should be the scale effect coming from diversification. The IOF grows and markets other fruits like oranges, plums and peaches, apart from pears. These different kinds of fruits share the same sale channels and also promote sale channels of each other. But cooperatives are more prone to focus on one fruit.

Figure 5, 6, and 7 are about values and percentages of cost and value composition of the three governance structures.

Figure 5. Cost and value composition of coop1

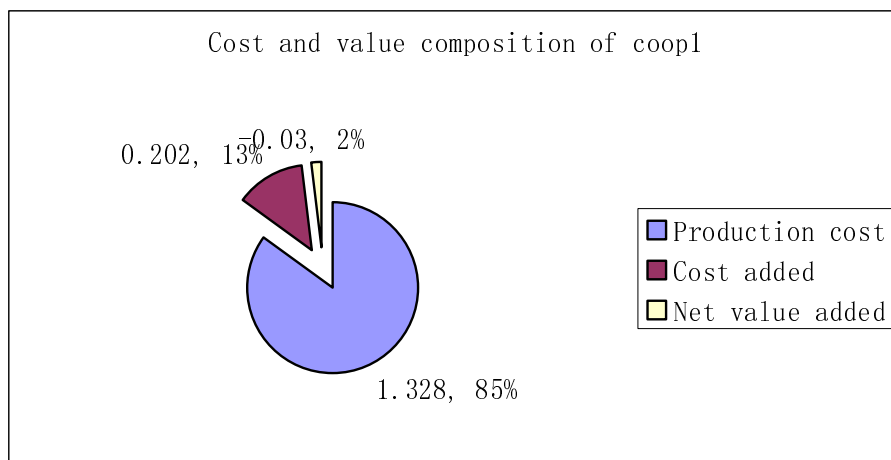


Figure 6. Cost and value composition of coop2

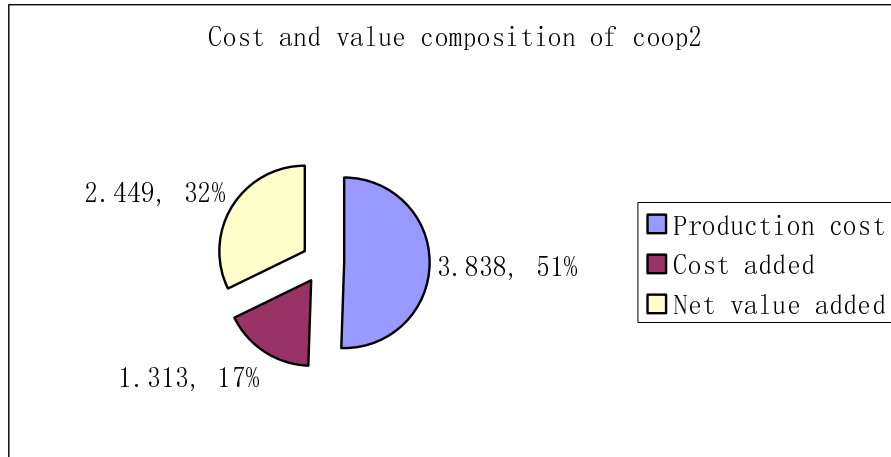
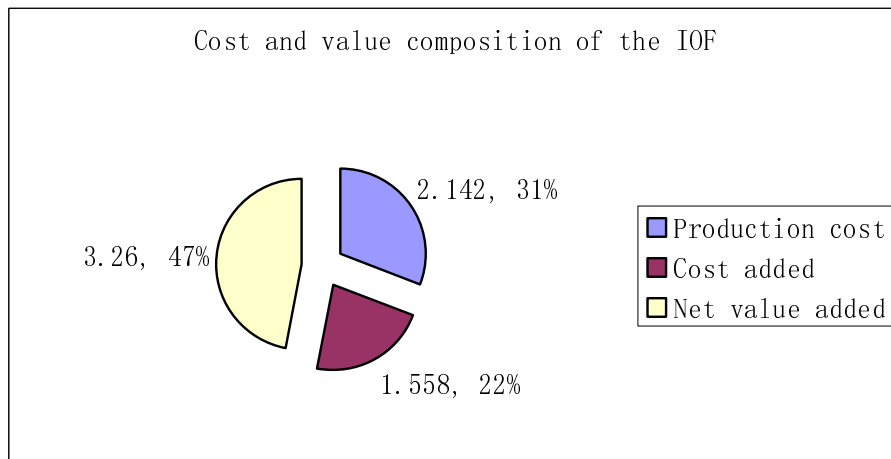


Figure 7. cost and value composition of the IOF



Besides the ascending in value added, there is also an increment in cost added or marketing cost, listed as the order from coop1, coop2, to the firm. The high cost added in the IOF is mainly due to the high labor cost. Cooperatives' characteristic of member owned and member used brings an advantage with respect to the cost of labor use efficiency. For instance, the IOF has to pay for the labor costs of purchasing and transportation, while the cooperatives don't.

6. Discussions and further researches

Discussions concerning the implications of the testing results are addressed (6.1),

and some further research questions are raised (6.2).

6.1 Discussion

The case analysis tests the proposition that traditional cooperatives are prone to under-invest, while new generation cooperatives are more interested in investment and investment return. And IOFs are likely to have higher value added efficiency than cooperative. The result provides support for the perceived theories (Cook and Iliopoulos, 2000; Valentinov, 2007) that cooperatives of open membership, vaguely defined ownership rights, and defensive purpose are likely to have under-investment problem and low economy efficiency, and explicitly defined ownership contributes to higher economy efficiency.

One of the main predictions that we can obtain from the data of our case study is that an IOF usually has a significant higher efficiency of value added than a cooperative. It is therefore puzzling from the perspective that farmer cooperatives are gaining speed in agro-food market while there are less agricultural firms in the domain of fresh product marketing. This phenomenon seems to contradict with standard economics theory that organization of low efficiency would be replaced by that of high efficiency. An explanation may be that farmer cooperatives have a lot of advantages over IOF, taking into consideration of farmers' benefits.

Firstly, the objectives of a cooperative and an IOF are different. An investor owned firm aims for interest maximization of shareholders while a farmer cooperative pursues to maximize the benefits of all the members. Despite of the DFD firm's higher investment ratio, farmers can not gain a piece from the cake of the firm's profit.

In contrast, gains of cooperative will be distributed to members at the end of production year.

Secondly, one of the key attributes of an organization is the decision making system. More active participation of members in decision making is expected in cooperatives due to the substantial financial stake in the cooperative by the members (Hendrikse and Veerman, 2001). This voice in decision making gives farmers preference over transaction with other organization forms.

Thirdly, cost externalization may be one of the factors that relates to the development of farmer cooperatives. Nowadays, farmer cooperatives in China are still at a take-off stage, which determines the developing mode of low investments and low profits. The government allows cooperatives to externalize part of their expenses by subsidies and preferential tax treatment.

Last but not least, a cooperative is an organization owned and used by farmers. As far as we know, a sense of belonging is a necessity in our daily life, which is even reinforced because of farmers' limited knowledge and communities. Farmer cooperatives are established on the basis of trust and culture. The trusts between each member, either core members or common members, make the dependence of farmers on cooperatives easier and stronger.

The main lesson from the case study is that there is still a long way to go before farmer cooperatives in China survive by themselves, and establish their own blood hematopoietic function and system, without subsidies and support from governments or donations. The trade-off is that cooperatives on the one hand behave as a

benefit-maximizing firm in the big markets and on the other hand try to maintain the advantages of a cooperative as a farmer-controlled organization.

Besides, the markets are undergoing changes of consumer interests and food consuming structures. Contract-production and systems of vertical co-ordination are replacing spot markets (Martinez and Reed, 1996). New generation cooperatives, who organize farmers in a relatively tight way, are prone to gain higher prices by ensuring product volume and quality of members.

6.2 Further research

There are several directions for future research. First, this case study is limited by the size of the sample, which consists of 3 organizations. More cases are needed for further testing and analysis. Then regression analysis can be adopted if the size of the sample is big enough. Second, there is scope for research investigating that traditional cooperatives will be replaced by new generation cooperatives, or will they coexist? New generation cooperatives seem to have advantages in quality control and volume assurance over traditional cooperatives. Will traditional farmer cooperatives survive or transform to new generation cooperatives?

Appendix 1: Costs and prices of coop1

Table 1: Production costs description of five members of the traditional cooperative

	Total cost (RMB)	Output (kg)	Cost per kg (RMB/kg)
Farmer 1	32281.6	26000	1.24
Farmer 2	42710	35000	1.22
Farmer 3	16735	8600	1.95
Farmer 4	26066	25000	1.04
Farmer 5	19690	16600	1.19

Notes: the total cost includes costs of fertilizer, pesticide, bagging, labors⁵, and others.

⁵ Labor cost of farmers themselves is standardized as the minimum wage of farming per capita per day plus days

Table 2: Statistical description of cost per kilogram:

N	Valid	5
	Missing	0
Mean		1.3280
Std. Error of Mean		.15942
Median		1.2200
Std. Deviation		.35647

Table 3: Costs added of coop1

Items	Costs (RMB)	Quantity (tons)	Cost added (RMB/kg)
Rent for office building and packing workshop	5000	1000	0.202
Electricity cost of cold house	4000		
Labor cost	20000		
Packing cost	166000		
Administration expense of markets	7000		
Total value	202000		

Appendix 2: Costs and prices of coop2

Table 1: Production costs description of five members of the traditional cooperative

	Total cost (RMB)	Output (kg)	Cost per kg (RMB/kg)
Farmer 1	37000	12500	2.960
Farmer 2	107109	30100	3.558
Farmer 3	146600	30000	4.887
Farmer 4	30940	7900	3.916
Farmer 5	116045.5	30000	3.869

Table 2: Statistical description of cost per kilogram:

that are put into production and marketing.

N	Valid	5
	Missing	0
Mean		3.8380
Std. Error of Mean		.31279
Median		3.8690
Std. Deviation		.69942

Table 3: Costs added of coop2

	Costs	Quantity (tons)	Cost added
Depreciation cost of set assets	13000	60	1.313
Rent for office building	2000		
Electricity cost	2000		
Packing cost (including labor cost)	40800		
Operational cost	21000		
Total value	78800		

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