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Japanese Agriculture Cooperatives in Food Manufacturing Industries[1]

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Abstract

Food manufacturing by agriculture cooperatives is portrayed as an enterprise that is owned by the suppliers of raw agricultural products. Typically, in this type of enterprise, decision making is democratically made by the member farmers, and the surplus is divided among them according to the amount of raw agricultural products they supply to the firm. In this paper, we seek to find comparative efficiency and inefficiency of food manufacturing firms run by agriculture cooperatives.

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1 Introduction

Food manufacturing by agriculture cooperatives is portrayed as an enterprise that is owned by the suppliers of raw agricultural products. [1] Typically, in this type of enterprise, decision making is democratically made by the member farmers (*i.e.*, one member-one vote), and the surplus is divided among them according to the amount of raw agricultural products they supply to the firm. (Figure 1.) The performance of farmer owned firms may therefore well be different from that of orthodox investor owned firms, where decision making is ultimately subject to one share-one vote by the shareholders, and the profit is divided among them according to the equity shares they hold. Based on empirical observations, this paper attempts to find comparative efficiency and inefficiency of food manufacturing firms run by agriculture cooperatives. [2]

[1] The agriculture cooperatives are the largest cooperative organization in Japan. As of 1998, there were over 2000 agriculture cooperatives with more than 5 million members nationwide. Each agriculture cooperative is hierarchically organized under the prefectural union, and each prefectural union is further hierarchically organized under the national union. (So the whole agriculture cooperative is a three-tier organization.) Business activities of agriculture cooperatives range from credit, insurance, the collective purchasing of production materials and livelihood necessities, the collective marketing of agricultural products, agricultural warehousing, processing and manufacturing of agricultural products, to supplying of housing lots. Total business profit from these activities amounted to 2.3 trillion yen (or about 22 million dollars) in 1997. (Data based on Ministry of Agriculture, Forestry and Fisheries (1997).)

[2] Overall, manufacturing industries are under relatively weak governmental regulations compared with other industries. According to Economic Planning Agency (1994), the share of regulated industries in manufacturing industries was 14.1%. The shares of regulated industries in other industries were 87.1% for agriculture, forestry and fisheries, 100% for mining, 100% for construction, 100% for electricity, gas, heat supply and water, 97.3% for transport and communications, 100% for finance and insurance, 7.5% for real estate, 55.6% for service, and 0% for government. (The share for wholesale and retail trade, eating and drinking places was not available in the report.) The relatively low level of regulation in manufacturing industries implicitly means that the observed distribution of various forms of enterprise can be interpreted as a result of the free choice of enterprise form.

The next section applies the analytical framework of Hansmann (1988) to the present context of food manufacturing by agriculture cooperatives. Section 3 takes five food manufacturing industry groups that are important for Japanese agriculture cooperatives, and examines economic reasons for their active involvement with each of these undertakings. Section 4 concludes the paper with some remarks.

2 Efficiency of agriculture cooperatives in food manufacturing

Under farmers' ownership of a food manufacturing firm, input of raw agricultural products is provided to the firm through ownership (*i.e.*, self-sufficiently), whereas capital input, as well as labor input, is provided to the firm through the market, and output is traded in the market, too. (Figure 1.) [3] This is in contrast to the transactions of input and output under capital suppliers' ownership of the firm (*i.e.*, investor owned firm), in which capital input is provided to the firm through ownership, whereas input of raw agricultural products, as well as labor input, is provided to the firm through the market, and, of course, output is traded in the market. Farmers' ownership of the firm is therefore a system of transactions of input and output which saves the costs that are associated with market transactions of raw agricultural products and instead incurs the costs that are associated with collective ownership of the firm by the farmers. [4] Hence, a comparative efficiency for agriculture

[3] Ownership of the firm consists of the right to control the firm and the right to claim the residual earnings of the firm. This concept is different and must be clearly distinguished from ownership of physical assets for production of the firm, as discussed in Hart and Moore (1990).

[4] In contrast, capital suppliers' ownership of the firm is a system which saves the costs that are associated with market transactions of capital input and incurs the costs that are associated with collective ownership of the firm by the capital suppliers.

cooperatives in undertaking a food manufacturing business can arise when (a) the costs that are associated with market transactions of raw agricultural products are large (relative to the costs that are associated with market transactions of capital), and (b) the costs that are associated with collective ownership of the firm by the farmers are small (relative to the costs that are associated with collective ownership of the firm by the capital suppliers). [5]

Hansmann (1988) listed several representative factors that constitute the costs of market and firm ownership. In what follows, we apply those factors to the specific context of food manufacturing by agriculture cooperatives. The first three factors (market power, *ex post* market power, and asymmetric information) are concerned with the costs of market, whereas the last two factors (monitoring and risk bearing) are concerned with the costs of ownership. [6]

Market power

The major cost of using the market of raw agricultural products that

[5]Firm ownership by the farmers implies a vertical integration of production of raw agricultural products and production of processed foods. In this sense, we henceforth use the term 'vertical integration' of food processing by agricultural cooperatives to mean the farmers' ownership of the firm.

[6]Of course, there are other factors besides those listed by Hansmann (1988) that affect the efficient form of enterprise. In particular, influences from the institutional framework and legal system seem nonnegligible. Unlike stock companies, cooperatives are not allowed to issue bonds to finance capital, and therefore their way of externally financing capital is limited to borrowing from financial institutions. Agriculture cooperatives are legally prohibited from borrowing a large amount of funds for investment, though. In addition, their scope of undertakings and area of activity are strictly restricted. These restrictions seem to discourage agriculture cooperatives from undertaking food manufacturing. On the other hand, a corporate income tax rate is applied to agriculture cooperatives that is lower than the rate imposed on stock companies. Furthermore, under some conditions, agriculture cooperatives are exempted from an application of the anti-trust law. These factors seem to work in favor of the advancement of agriculture cooperatives into the food manufacturing business. In this paper, however, we focus our mind on the economic reasons and do not deal explicitly with these institutional aspects.

is associated with market power seems to arise from monopsonistic power imposed on farmers by large food manufacturers. The cost therefore is considered large when the number of manufacturers is small and, as a result, the product market is monopolistic. If agriculture cooperatives vertically integrate the manufacturing stage, this inefficiency can be prevented.

Ex post market power

The major cost of using the market of raw agricultural products that is associated with *ex post* market power seems to arise from an underinvestment in production facilities as a response to a possible termination of trade of raw agricultural products. That is, if an investment in a food manufacturing facility is specific to the relationship with a local group of farmers which supplies certain raw agricultural products, the investment level tends to become smaller than the socially efficient level in order to be ready for a termination of transactions in the raw agricultural products. The cost, therefore, will be larger when there is a strong relational specificity between the facilities and the local agricultural products, and presumably when the efficient size of production facilities is large. If farmers own the physical assets for production themselves, presumably by borrowing funds from outside, and vertically integrate the manufacturing stage, this inefficiency can be prevented, or at least more or less be reduced. [7] [8]

Asymmetric information

The major cost of using the market of raw agricultural products that

[7] Putterman (1984) and Hansmann (1988) discussed the possibility that a class of individuals owns physical assets for production entirely by borrowing in a noncapitalistic firm.

[8] Another possibility to avoid opportunism would be to let capital owners become farmers as well, but this seems unrealistic. In particular, ownership of a farm by joint stock companies is prohibited by law in Japan.

is associated with incomplete information seems to arise from asymmetry of information on the characteristics and quality of raw agricultural products. If the quality of agricultural products is only known to the farmers but not to independent manufacturers, there can arise informational problems such as moral hazard or adverse selection in the market transaction of raw agricultural products. The cost therefore will be larger when the quality of raw agricultural products is hard to observe by the third parties, and when that information affects to a large extent the production costs and the quality of the final products. If agriculture cooperatives vertically integrate the manufacturing stage, this inefficiency can more or less be reduced.

Monitoring [9]

Under the separation of ownership and control, there inevitably arise the cost of investigation whether the management is appropriately executed for the sake of the firm owners. One possible case in the present context where the monitoring cost under farmers' ownership seems small is when the production facilities are located in the farmers' home area, since in that case the farmers are in a good position to check the daily operations of the factories.

Risk bearing

Agriculture cooperatives consist of family-managed farmers, and their livelihood depends to a large extent upon the activities of the cooperative they belong to. The member farmers are therefore not in a good position to

[9]Besides monitoring, Hansmann (1988) listed collective decision making as a source of cost for firm ownership. In a sense, however, the problem of collective decision making is closely related to the problem of monitoring, as Hansmann himself mentions. In this paper, we deal with the problem of collective decision making only in the context of monitoring under the separation of ownership and control.

diversify the risks from the undertakings of food manufacturing, compared to the investors of stock companies. Consequently, agriculture cooperatives are intrinsically more risk-averse than stock companies in undertaking the food manufacturing business. [10] The cost of farmers' ownership that is associated with risk bearing thus will be larger when the food manufacturing business is accompanied with substantial risks, and presumably when a large amount of investment is required to undertake the business.

3 Empirical observations and theoretical interpretations

The scope of food manufacturing industries is confined here to twelve small (three-digit) industry groups coded from 121 to 129, and from 131 to 133, in the Standard Industrial Classification for Japan (SIC) revised in 1993 (Table 3). In this section, from these food manufacturing industries, we take five detailed (four-digit) industry groups of the SIC which bring large proceeds to the agriculture cooperatives (Table 1). We then examine the economic reasons for the comparative efficiency of agriculture cooperatives in reference to the five economic factors concerning costs of market and firm ownership discussed in the previous section.

Meat products [1211], *Dairy products* [1212]

The categories of meat processing and milk processing in Ministry of Agriculture, Forestry and Fisheries (1997) correspond to the divisions of meat products [1211] and dairy products [1212], respectively, of the SIC (Tables 1 and 3). The agriculture cooperatives' sales of meat processing and milk

[10] In particular, managers of agriculture cooperatives assume unlimited liability for the results of the cooperative's undertakings.

processing amount to 24.0 and 24.5 billion yen, respectively, which constitute 12.2% and 12.4%, respectively, of the total sales of their processed goods (Table 1). As of 1991, 43 (3.6%) agriculture cooperatives and 63 (16.1%) stock companies funded by agriculture cooperatives were engaged in the manufacturing of meat products, whereas 35 (2.9%) agriculture cooperatives and 65 (16.9%) stock companies funded by agriculture cooperatives were engaged in the production of milk (Table 2). [11] The employee ratio of cooperative (and other types of noncapitalistic) firms is 4.3% in the manufacturing of meat products, whereas it is 9.0% in the manufacturing of dairy products (Table 3, Ratio 2).

There seems to be a substantial monopsonistic power in the markets of raw meat and milk. There are six meat product manufacturers which list their equity at the first section of the Tokyo Stock Exchange Market. [12] The CR3 (sum of the market shares of the top three companies) is 44.1% for ham, 57.7% for sausages, and 84.9% for corned beef. Overall, the CR4 for meat products exceeds 60%. [13] It is often referred to that meat processing by agriculture cooperatives is to rival the domination over the meat product market by downstream firms such as manufacturers, wholesalers or

[11] There are two types of farmer owned enterprise: enterprises that are directly managed by agriculture cooperatives, and firms in joint stock company form that are funded by agriculture cooperatives (called 'cooperative companies'). Although firms of the latter type are legally not cooperatives but stock companies, many of them can be regarded as a variation of cooperative enterprise of the former type. Indeed, in many (if not all) cooperative companies, (1) a substantial share of the equity is owned by the parent agriculture cooperative, and the equity is not traded in an open market; (2) there are no dividends on the equity; and (3) often managers come from the parent agriculture cooperative. By these reasons, we do not explicitly distinguish these two types of farmer owned enterprises in this paper.

[12] The six meat product manufactures are Itoham Foods, Nippon Meat Packers, Prima Meat Packers, Marudai Food Co., Hayashikane Sangyo Co., and Yonekyu Corp..

[13] Nikkan Keizai Tsushinsha (1997), chapters 9 and 15.

retailers. [14] Similarly, the market for dairy products is highly oligopolistic. Three dairy product manufacturers list their equity at the first section of the Tokyo Stock Exchange Market. [15] The CR3 is 90% for cheese, 60% for powdered milk, 52% for butter, and 48% for milk. [16] In addition, since price elasticity of supply of raw milk is quite small (raw milk is easily perishable and must be processed very quickly after extraction), monopsony power is easily exercised by milk product manufacturers over the ranchers even in a small local economy. Indeed, it is argued that ranchers have long struggled with low and unstable milk prices that are offered by large manufacturers. For instance, it is reported that ranchers' dissatisfaction with low milk prices that are offered by major manufacturers was the principal motivation for the establishment of the current Yotsuba Milk Products Co., a major milk processing firm in joint stock company form funded by several agriculture cooperatives in Hokkaido prefecture. [17] The markets for raw meat and milk are thus considered highly monopsonistic, and one incentive for agriculture cooperatives to vertically integrate the meat and milk processing seems to be for avoiding monopsonistic power imposed on them by major manufacturers in the markets for raw meat and milk.

Another reason for agriculture cooperatives to undertake meat and milk processing could be that knowledge of the nature and quality of raw meat and milk gives ranchers an advantage in producing differentiated or, in particular, high quality products. Generally speaking, ranchers have accurate and detailed information about the nature and quality of the livestock products they produce, whereas it seems difficult or costly for third parties to

[14] Shiraishi (1985b)

[15] The three dairy product manufacturers are Snow Brand Milk Products Co., Morinaga Milk Industry Co., and Meiji Milk Products Co..

[16] Nikkan Keizai Tsushinsha (1997), chapter 8.

[17] Higurashi (1985b).

fully observe it. This informational advantage enables ranchers to adopt production lines that are suitable to the raw livestock products, and, on the contrary, ranchers can produce raw meat and milk that match their processing technologies. [18] In fact, it is commonly observed that agriculture cooperatives take a corporate strategy to vertically differentiate their products from the standardized products made by large manufacturers. For instance, the Tohaku-cho Agriculture Cooperative in Tottori prefecture has a policy in principle to use only the raw meat they produce as a factor of production, and to use salt and food additives as little as possible, in order to have their products gain prestige value to be of high quality and health conscious. [19] This is in sharp contrast to the production doctrine adopted by large manufacturers. Typically, large manufacturers produce a large amount of standardized products out of imported meat in large, highly automated plants, often with plenty of preservatives. This enables them to save production and distribution costs substantially. Such a difference in production styles between agriculture cooperatives and large manufacturers can also be seen in the manufacturing of dairy products. Usually, large dairy product manufacturers collect raw milk extracted from various types of milch cows raised in a wide range of areas and mix them to produce standardized milk. On the contrary, dairy products processed by agriculture cooperatives are basically made of the raw milk they extract themselves. For instance, the

[18] When consumers can observe the quality of the final products *ex ante* (search goods) or *ex post* (experience goods), the firm with private information has an incentive to produce high quality goods, no matter who owns the firm. When consumers cannot observe the quality of the final products even after purchasing and consuming the goods (credence goods), it is not clear whether the firm has a proper incentive to maintain the high quality level. However, if consumers doubt the quality of the final products and try to form a rational expectation of it, the firm can try to send a signal of the real quality of its products to the consumers (*e.g.*, through price or advertisement), and consequently will have a proper incentive to produce high quality products.

[19] Shiraishi (1985a).

Hiruzen Ranchers' Cooperative in Okayama prefecture has a corporate strategy to produce pure jersey milk by using only the raw milk extracted from their own jersey milch cows. [20] One prominent reason in Japan why the milk made by agriculture cooperatives attracts consumers' popularity seems to be the consumers' strong desire for safe milk. Japanese consumers have experienced several polluted milk cases, and have become especially alert in the safety of milk and dairy products. [21] Knowing the nature of raw milk, and equipped with labor intensive production facilities, agriculture cooperatives seem to be in an advantageous position to keep safety, or more generally high quality, of their products, compared to their large stock company counterparts. Informational advantage on raw livestock products thus seems to be an important factor that motivates agriculture cooperatives to undertake meat and dairy product manufacturing.

Canned and preserved fruit and vegetable products except pickled vegetables [1231]

The category of bottling and canning of fruits and vegetables in Ministry of Agriculture, Forestry and Fisheries (1997) roughly corresponds to the division of canned and preserved fruit and vegetable products except pickled vegetables [1231] of the SIC (Tables 1 and 3). The agriculture cooperatives' sales of vegetable and fruit products (excluding pickles) amount to 29.3 billion yen, which constitutes 14.9% of the total sales of their processed goods

[20] Takenaka (1985a).

[21] The most serious case of polluted milk is the Morinaga Arsenic-contaminated Milk Case that took place in 1955. Sodium secondary phosphate for industry use was used by mistake as a food additive in powdered milk for babies in a factory of Morinaga Milk Industry Co.. Then, the powdered milk got contaminated with deadly arsenious acid, which was contained in the sodium secondary phosphate. As the result, 130 babies were killed and more than 12,000 babies were seriously injured by the milk. See Kawana (1989), chapter 5, for the details of this case.

(Table 1). The employee ratio of cooperative (and other types of noncapitalistic) firms in this industry group is 9.4% (Table 3, Ratio 2).

Factories for the processing of fruits and vegetables are usually built in inland areas near the place of crop production. For instance, canned tangerines are produced in Nagasaki prefecture, the major area for tangerine production; canned peaches in Yamagata prefecture, the major area for peach production; and canned pineapples in Okinawa prefecture, the major area for pineapple production. [22] The advantages of operating factories at the place of production for raw fruits and vegetables are to keep the freshness of the raw products, and presumably to save on transportation costs. Such on-the-spot production implies that the factories for vegetable and fruit products that are located far from urban areas have more or less a site specificity. This suggests that, if the transaction of a raw agricultural product that is cropped in a local area is terminated, the factories are of little use. [23] In addition, the value of physical assets per establishment is 177 million yen in this industry, which is not negligible (Table 3, Capital). In this circumstance, investment in production facilities tends to become lower than the efficient level due to possible termination of trade of the raw agricultural products. This inefficiency can be prevented if farmers themselves own the factories and undertake the processing of the fruits and vegetables they crop.

Similarly to the case of raw meat and milk discussed in the previous sub-

[22] Japan Food Journal (1997), volume 2, pp. 342-344.

[23] It is told, in theory, that termination of trade in local agricultural products would come from the strategic behavior of farmers. In practice, however, holding back investment in a rural community can arise even in the absence of farmers' intentional termination of trade. For instance, production of the raw agricultural products may decrease in the near future due to the lack of successors for the farm. Or, even if currently there is a large demand for a processed food of a local agricultural product, the boom may be over soon. In either case, the production facilities that are once built in the countryside become devaluated, and this backwardly prevents investment in the local community.

section, another incentive for agriculture cooperatives to engage in processing of their fruits and vegetables may come from their informational advantage in producing differentiated or high quality products. For the obvious reasons, farmers are well informed about the characteristics and quality of their crops. In addition, agriculture cooperatives are usually endowed with small scale processing facilities, and their methods of processing fruits and vegetables are necessarily highly labor intensive. These properties (a sufficient knowledge on the quality of raw fruits and vegetables, and labor intensive production methods) can give agriculture cooperatives an advantage in producing a small amount and wide variety of high quality products. For instance, it is the policy of the Oita Oyama-machi Agriculture Cooperative in Oita prefecture to use only their own agricultural products as inputs, and not to make a large scale investment in production facilities but to rely mostly on human hands to produce homemade-like products. Despite its small organizational size with just 690 farmers, the cooperative produces over 40 kinds of processed fruit and vegetable products, such as strawberry jam, plum jam, plum jelly, marmalade, etc.. In order to maintain their brand name recognition for high quality products, the cooperative has a sales strategy not to supply their products to the supermarkets and other discount stores but to wholesale only to the department stores and prestigious consumer cooperatives. [24] Informational advantages in the quality of raw products thus seem to be a reason for agriculture cooperatives to engage in the manufacturing of fruit and vegetable products.

Lastly, the fact that the factories for processing fruits and vegetables are built near the location of crop production may imply that the cost of monitoring for agriculture cooperatives is low in this industry. Geographical

[24] Masui (1985).

propinquity makes it possible for farmers to check frequently on the operations of the factories, and therefore the factory workers are likely to be put under a close watch by the directors and other members of the agriculture cooperatives.

Starch [1292]

The category of starch and potato processing in Ministry of Agriculture, Forestry and Fisheries (1997) roughly corresponds to the division of starch [1292] of the SIC (Tables 1 and 3). [25] The item in this industry group where agriculture cooperatives have a substantial market share is potato starch. Over 90% of all starch and other potato products manufactured by agriculture cooperatives is produced by agriculture cooperatives in Hokkaido prefecture. The agriculture cooperatives' sales of starch and potato products amount to 37.5 billion yen, which constitutes 19.0% of the total sales of their processed goods (Table 1). As of 1991, 67 (5.6%) agriculture cooperatives and 22 (5.6%) stock companies funded by agriculture cooperatives were engaged in the production of starch (Table 2). The employee ratio of cooperative (and other types of noncapitalistic) firms in this industry group is 8.0% (Table 3, Ratio 2).

Historically, avoiding market power seems to have been a major reason for agriculture cooperatives to undertake the manufacturing of starch. A prominent instance is observed in the potato processing by the Shihoro Agriculture Cooperative in Hokkaido prefecture. Until the Second World War, the potato farmers in the village of Sihoro had long struggled with low price and unfair terms of trade in the transaction of potatoes with independent starch

[25] Potato products such as French fries and potato chips in the category of starch and potato processing in Ministry of Agriculture, Forestry and Fisheries (1997) are not included in starch [1292] of the SIC.

manufacturers in the community. [26] After the Second World War, the agriculture cooperative in the village bought out a factory from an independent starch manufacturer and began processing the potatoes they produced. The principal objective of the factory was to establish a stable and fair transactional relationship with the potato farmers. Potato processing by agriculture cooperatives has attracted wide popularity among the potato farmers, and today the scope of potato processing is not confined to starch production but has expanded to French fries and potato chips. [27] Preventing monopsonistic power thus seems to have been an incentive for agriculture cooperatives to engage in the manufacturing of starch and other potato products.

Site-specificity of the potato processing facilities could be another reason for potato farmers to undertake this business. Farming of potatoes and production of potato starch are concentrated in Hokkaido prefecture. About 77% (or 2,597 thousand tons) of the total domestic production of potatoes (which is 3,365 thousand tons) were produced in Hokkaido prefecture in 1995, and, as it is seen above, more than 90 percent of the potato starch made by agriculture cooperatives is processed in this region. Taking into account the rather large amount of physical assets for production (which is 335 million yen, or 3.04 million dollars, per establishment; see Table 3, Capital), we can imagine that the potato farming villages of the prefecture have had difficulty in introducing a new investment in potato processing facilities into the village. It may thus be a possibility that agriculture cooperatives of potato farmers in Hokkaido prefecture have come to own the factories themselves and engage in potato processing in order to cope with the underinvestment problems.

[26] One reason for the presence of stubborn local market power such as this case can be that the Japanese Fair Trade Commission has conventionally taken a mild stance in the application of the anti-trust law compared with its counterparts in western countries.

[27] Higurashi (1985a).

Tea [1331]

The manufacturing of tea leaves consists of two stages: processing the raw tea leaves into crude tea leaves, and refining the crude tea leaves into final tea leaves. The category of tea refining (both crude and final) in Ministry of Agriculture, Forestry and Fisheries (1997) corresponds to the division of tea [1331] of the SIC (Tables 1 and 3). The agriculture cooperatives' sales of tea refining amount to 23.8 billion yen, which constitutes 12.1% of the total sales of their processed goods (Table 1). Overall, agriculture cooperatives have a substantial share in the production of crude tea leaves, but have only a limited share in the production of final tea leaves. As of 1991, 159 (13.2%) agriculture cooperatives and 39 (9.9%) stock companies funded by agriculture cooperatives were engaged in the production of crude tea leaves, whereas 134 (11.1%) agriculture cooperatives and 26 (6.6%) stock companies funded by agriculture cooperatives were engaged in the production of final tea leaves (Table 2). The product in this category which agriculture cooperatives primarily deal with is green tea leaves.

There are a great many number of tea leaf manufacturers, and the concentration rate of the industry is low. [28] However, this does not mean that there is no serious market power in the transaction of tea leaves. Manufacturing and distribution of tea leaves have a long history in Japanese society, and its distribution system is said to be extremely conservative and closed. That is, major local tea leaf refiners/wholesalers have dominated the transaction of tea leaves and have exercised strong monopsony power over the tea leaf farmers. [29] There are several reasons that have created such industry charac-

[28]There are 3,200 green tea manufacturers, and CR3 is 13.3% for green tea, unpacked, and 35.5% for green tea, packed. See Nikkan Keizai Tsushinsha (1997), chapter 12, section 4.

[29]Takenaka (1984).

teristics. First, final tea leaf is a product that is highly differentiated. There is a wide diversity of preferences for tea according to area. For instance, green tea with a strong taste is preferred in Shizuoka prefecture; one with a somewhat raw taste is preferred in Kyoto prefecture; and one with a steamed taste is preferred in Osaka prefecture. One kind of green tea that is favored in an area is even minutely classified into smaller sorts. [30] Green tea is not only locally (or horizontally) differentiated but also vertically differentiated to a large extent. The quality grades of green tea are determined mainly by the time of picking the raw tea leaves. For instance, in Shizuoka prefecture, Japan's largest raw tea leaf planting and final tea leaf producing area, the raw tea leaves that are picked in the earliest time (the highest grade), the second earliest time (the second highest grade), the third earliest time (the third highest grade), and the fourth earliest time (the fourth highest grade), were priced at 484, 111, 79, and 38 yen, respectively, per kilogram in 1995. [31] Each grade is further minutely divided into several subgrades. [32] Because of such a fine horizontal and vertical differentiation, the market for tea leaves has been partitioned into small and closed local markets, and in each differentiated market a refiner/wholesaler has been in an easy position to exercise market power over the tea leaf farmers (monopolistic competition). Second, similarly to the case of raw milk, raw tea leaves quickly decay once they are picked, and therefore must be processed soon after the harvest.

[30] Ohishi (1983), chapter 1, section 1.

[31] Fuchinoue and Fuchinoue (1999), chapter 5, section 2, subsection 2.

[32] According to different data on Shizuoka prefecture during the three years from 1970 to 1972, green tea leaves that were picked at the beginning period, the middle period, and the final period, of the earliest time (the highest grade) were priced, on average, at 350, 192, and 166 yen, respectively, per kilogram. Similarly, green tea leaves that were picked at the beginning period, the middle period, and the final period, of the second earliest time (the second highest grade) were priced at 117, 90, and 76 yen, respectively, per kilogram. See Fuchinoue and Fuchinoue (1999), chapter 5, section 2, subsection 2.

Consequently, price elasticity of supply of raw tea leaves is necessarily low, and this creates a market environment in which monopsony power is easily exercised. [33] [34] For these two reasons (minute differentiation of kinds and quality, and low price elasticity of supply), the market for raw tea leaves is not so competitive as it might appear when referring to the statistical data, but rather it is judged quite monopsonitic. It can thus be imagined that tea leaf processing by agriculture cooperatives has been a measure to avoid strong monopsonistic power imposed on them by the downstream firms in the local market.

Tea leaf farmers' knowledge of the features of raw tea leaves can give a business advantage to agriculture cooperatives in the manufacturing of tea leaves. In particular, quality control of tea leaves seems relatively easy if they were processed in a vertically integrated line of agriculture cooperatives, from growing raw tea leaves to manufacturing final tea leaves. Indeed, it has been

[33]Presumably because of such unstable quality of raw tea leaves, a commercial custom has been created that raw tea leaves which are picked by the farmers are immediately handed over by farmers to manufacturers without a definite agreement on price. The price is later determined when the manufacturers recognize the quality of the tea leaves. In the *ex post* determination of the price, the manufacturers keep a dominant bargaining position, and there is no help for the farmers but to accept the price offered by the manufacturers. In a year of a good harvest, the manufacturers assign a quota on the amount of raw tea leaves they buy from farmers, and refuse to buy any additional quantity. Farmers are thus in a weak position against manufacturers in the transaction of raw tea leaves. See Fuchinoue and Fuchinoue (1999), chapter 5, section 2, subsection 4.

[34]In contrast to the perishable property of raw tea leaves, crude tea leaves can be preserved for an extended period of time. The crude tea leaf producers can therefore keep their products in cold storage and supply them to the market when the price is favorable to them. In addition, since raw tea leaves become about one-fifth in size when they are processed into crude tea leaves, it is less costly to transport crude tea leaves than to convey raw tea leaves. This makes it easy for the crude tea leaf producers to sell their products to the distant refiners outside the community. (See Fuchinoue and Fuchinoue (1999), chapter 5, section 2, subsection 4.) For these reasons, it seems that monopsonistic power is less easily exercised in the market for crude tea leaves than in the market for raw tea leaves. This may partly explain the reason why agriculture cooperatives actively engage in the processing of raw tea leaves but not so earnestly in the processing of crude tea leaves.

a custom of the industry not to label the information on the packages of final tea leaves, such as the place of production of the raw tea leaves or processing site of the tea leaves. It is reported that tea leaves made by the Kanagawa Prefectural Economic Federation of Agriculture Cooperatives have attracted wide popularity among consumers by revealing such information on its packages. [35] A reason behind this may be that consumers have a desire for safety information, such as the type and amount (or frequency) of agricultural chemicals that are used in growing the raw tea leaves. This information can easily be obtained and labeled on the packages if the tea leaves are produced in a vertically integrated line of agriculture cooperatives. Informational asymmetry thus can be a nonnegligible factor that promotes tea leaf processing by agriculture cooperatives.

Agriculture cooperatives also seem to have some advantages in tea leaf processing with respect to bearing risks. There is only a little variation in profits from tea leaf processing over the past decade (Table 3, Variance). In addition, tea leaf processing facilities are quite small in size compared with other food manufacturing businesses (Table 3, Capital). In such an industrial circumstance, the farmers' cost from bearing risks that are associated with tea leaf processing is considered relatively small, and this makes it easy for agriculture cooperatives to engage in the tea leaf production.

4 Conclusion

In this paper, we have examined the economic reasons for the advancement of agriculture cooperatives into food manufacturing business. We have seen that the reasons for agriculture cooperatives to engage in the processing of raw agricultural products vary across food categories, depending on the

[35] Ohshima (1985).

market structure, location of the processing facilities, type and degree of informational asymmetry on the quality of raw agricultural products, stability of earnings, etc..

Among the various factors that determine the efficient form of food manufacturing enterprise, the role of asymmetric information on the quality of raw agricultural products seems to be worth paying special attention to in understanding the characteristics of food manufacturing industries in Japan. There are two notable features for the food supply system in Japan. First, the country heavily depends upon the imports of raw materials for food from overseas, and secondly, consumers have a solid preference for high quality and, in particular, safe foods. Generally speaking, imported raw agricultural products are less costly for firms to use as the factor of production compared with domestic ones, reflecting a large scale and capital intensive agriculture overseas in contrast to a small scale and labor intensive domestic agriculture. Major food manufacturing companies then typically use economical imported raw agricultural products as input, and produce a large volume of standardized products in large scale and capital intensive plants. In contrast, agriculture cooperatives use costly domestic (*i.e.*, their own) raw agricultural products as input, and produce a small volume of differentiated products in small scale and labor intensive facilities. Consequently, the final products of agriculture cooperatives are necessarily priced higher in the market than those of large manufacturing companies. Nevertheless, supported by the consumers who wish to obtain high quality and safe foods, the products of agriculture cooperatives steadily maintain a certain competitiveness in the market. This may explain why Japanese food manufacturing industries often exhibit a bi-polar concentration structure (where standardized national brands and differentiated local brands coexist in a single market), and the

number of enterprises is great many while the size of each enterprise is quite small compared with those of western developed countries. [36] [37] In sum, it seems a structural characteristic of Japanese food manufacturing industries that a small number of major manufacturing companies supply standardized products at a moderate price, whereas a large number of minor manufacturers, including agriculture cooperatives, supply differentiated products at a higher price.

[36] As for bi-polar concentration structure of Japanese food manufacturing industries, see Tokoyama and Egaitsu (1995).

[37] As of 1982, the number of all food manufacturing enterprises was 80,802 in Japan, whereas it was 26,887 in the United States, 6,747 in Britain, 4,653 in West Germany, and 3,485 in Australia. The average number of employees per enterprise was 15 in Japan, whereas it was 58 in the United States, 97 in Britain, 102 in West Germany, and 51 in Australia. See Onodera (1987).

References

[1] Central Union of Agricultural Cooperatives, 1991, *National survey on activities of agriculture cooperatives.* (Nokyo no katusdo ni kansuru zenkoku issei chosa hokoku.) Tokyo: Central Union of Agricultural Cooperatives.

[2] Central Union of Agricultural Cooperatives, 1998, *Data list of local specialty processed foods by agriculture cooperatives.* (JA Chiiki tokusan kakohin data list.) Tokyo: Central Union of Agricultural Cooperatives.

[3] Economic Planning Agency, 1994, *Economic white paper.* Tokyo: Ministry of Finance.

[4] Fuchinoue, Yasumoto, and Fuchinoue, Hiroko, 1999, *Encyclopedia of Japanese tea.* (Nihoncha zensho.) Tokyo: Nosangyoson Bunka Kyokai.

[5] Hansmann, Henry, 1988, "Ownership of the firm." *Journal of Law, Economics, and Organization* 4-2: 267-304.

[6] Hart, Oliver, and Moore, John, 1990, "Property rights and the nature of the firm." *Journal of Political Economy* 98-6: 1119-1158.

[7] Higurashi, Kenji, 1985a, "Potato processing by agriculture cooperatives and the local agriculture." (Nokyo baresho kako to chiiki nogyo.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *Development of local economy and food processing by agriculture cooperatives.* (Chiiki keizai no hatten to nokyo kako.) Tokyo: Jichosha, 129-149.

[8] Higurashi, Kenji, 1985b, "Milk processing by agriculture cooperatives and the local agriculture." (Nokyo gyunyu kako jigyo to chiiki nogyo.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *op. cit.*: 229-248.

[9] Hyogo Prefectural Union of Agricultural Cooperatives, 1991, *A method for energizing regional farming: A way for the Hyogo agricultural cooperative to make farming more prosperous in the 1990s.* Kobe: Hyogo Prefectural Union of Agricultural Cooperatives.

[10] Japan Food Journal, 1997, *Encyclopedia of food industries.* (Shokuhin sangyo jiten.) Sixth edition, volume 1 and volume 2. Tokyo: Japan Food Journal.

[11] Japan Food Journal, 1998, *List of firms in food industries.* (Shokuhinkai sogo meibo.) Tokyo: Japan Food Journal.

[12] Kawana, Hideyuki, 1989, *Drug and food pollution.* (Yakuhin shokuhin kogai.) Tokyo: Ryokufu Shupan.

[13] Kawano, Shigetou (ed.), 1986, *Encyclopedia of cooperatives.* (Kyodo kumiai jiten.) Second edition. Tokyo: Ienohikari Association.

[14] Management and Coordination Agency, 1993, *The standard industrial classification for Japan.* Tokyo: National Federation of Statistical Associations.

[15] Management and Coordination Agency, 1998, *1996 Establishment and enterprise census of Japan.* Vol. 1-1. Tokyo: Management and Coordination Agency.

[16] Masui, Yoshio, 1985, "One village-one good movement and food processing by agriculture cooperatives." (Isson-ippin undo to nokyo kako.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *op. cit.*: 91-109.

[17] Mikami, Kazuhiko, 1999, "Proxy contests and corporate democracy." *Journal of Economic Behavior and Organization* 40-4: 353-371.

[18] Mikami, Kazuhiko, 2000, "Increasing efficiency by giving up some profit." *Journal of Institutional and Theoretical Economics* 156-2: 348-359.

[19] Ministry of Agriculture, Forestry and Fisheries, 1997, *Statistics on agricultural cooperatives.* Tokyo: Ministry of Agriculture, Forestry and Fisheries.

[20] Ministry of International Trade and Industry, 1998, *1996 census of manufacturers: Report by enterprise.* Tokyo: Ministry of International Trade and Industry.

[21] Nikkan Keizai Tsushinsha, 1997, *Production and sales shares of alcoholic beverages and foods.* (Shurui shokuhin sangyo no seisan hanbai share). Tokyo: Nikkan Keizai Tsushinsha.

[22] Ohishi, Sadao, 1983, "History of tea industry development in Japan." (Nihon chagyo hattatsusi.) Tokyo: Nosangyoson Bunka Kyokai.

[23] Ohshima, Kazutsugu, 1985, "Development and function of tea leaf processing by agriculture cooperatives." (Nokyo cha kako jigyo no tenkai to kino.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *op. cit.*: 195-209.

[24] Onodera, Yoshiyuki, 1987, "The management and economy structure of food manufacturing industries." (Shokuhin kogyo no keiei keizai kozo.) In: Namiki, Masayoshi (ed.), *Japanese food manufacturing industries towards the 21st century: Management/economy.* (21 Seiki wo mukaeru Nihon no Shokuhin Sangyo: Keiei/Keizai.) Tokyo: Nosangyoson Bunka Kyokai: 75-113.

[25] Putterman, Louis, 1984, "On some recent explanations of why capital hires labor." *Economic inquiry* 22-2: 171-187.

[26] Shiraishi, Masahiko, 1985a, "Meat product manufacturing by agriculture cooperatives and the area formation of hog raising." (Nokyo no shokuniku kakohin seisan to yoton no sanchi keisei.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *op. cit.*: 111-127.

[27] Shiraishi, Masahiko, 1985b, "Meat treatment by agriculture cooperatives and the wide collective agricultural area." (Nokyo no shokuniku shori kako to koiki eino danchi.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *op. cit.*: 151-165.

[28] Shiraishi, Masahiko, 1995, "Today's characteristics of agricultural product processing and the development directions of agriculture cooperatives." (Nosanbutu kako no gendankaiteki tokusei to nokyo no tenkai hoko.) In: Agricultural Marketing Society of Japan, *Reformation of food distribution and the problems of cooperatives.* (Shokuryo ryutu saihen to towareru kyodo kmiai.) Tokyo: Tsukuba-Shobo Publishing Company: 133-152.

[29] Takenaka, Kunio, 1984, *Culture and economy of green tea.* (Ryokucha no Bunka to Keizai.) Tokyo: Ienohikari Association.

[30] Takenaka, Kunio, 1985a, "Hiruzen jersey ranch and milk processing." (Hiruzen jersey rakuno to gyunyu kako.) In: Takenaka, Kunio, and Shiraishi, Masahiko (eds.), *op. cit.*: 47-72.

[31] Teramoto, Yasuhide, 1999, *A Research on the history of prewar Japanese tea business.* (Senzenki nihon chagyousi kenkyu.) Tokyo: Yuhikaku.

[32] Tokoyama Hiromi, and Egaitsu Norio, 1995, "Industrial organization of food manufacturing industries." (Shokuhin kogyo no sangyo soshiki.) In: Norio Egaitsu and Teizo Higuchi (eds.), *Industrial organization of agri-business.* (Agri-business no sangyo soshiki.) Tokyo: The University of Tokyo Press: 173-194.

Items	Sales	Ratio
Rice & barley polishing	11,730,599	6.0
Milling	4,013,780	2.0
Starch & potato processing	37,452,481	19.0
Pickles manufacturing	14,956,589	7.6
Soy bean paste & sauce	1,917,377	1.0
Bottling & canning of fruits & vegetables	29,304,532	14.9
Meat processing	24,031,738	12.2
Milk processing	24,484,349	12.4
Tea refining	23,781,148	12.1
Fertilizer	1,955,739	1.0
Feed	1,382,837	0.7
Others	21,972,116	11.2
Total	196,997,752	100.0

Table 1:
Sales (thousand yen) and ratio (%) of processed goods & by-products of 872 agriculture cooperatives. Ministry of Agriculture, Forestry and Fisheries (1997).

Note: Sales by firms in joint stock company form are not included.

Items	Agriculture cooperatives		Joint stock company		Women's section		Voluntary group	
	#	%	#	%	#	%	#	%
Starch	67	5.6	22	5.6	5	0.7	19	1.4
Pickled vegetables	395	32.8	128	32.7	341	49.1	550	39.9
Soft drinks	151	12.6	49	12.5	57	8.2	108	7.8
Jam	69	5.7	28	7.1	118	17.0	188	13.6
Noodles	52	4.3	72	18.4	22	3.2	177	12.8
Rice products	125	10.4	35	8.9	63	9.1	135	9.8
Confectioneries	26	2.2	74	18.9	50	7.2	204	14.8
Canned & preserved food	140	11.6	72	18.4	74	10.6	172	12.5
Alcoholic beverages	31	2.6	99	25.3	2	0.3	103	7.5
Soy bean paste	484	40.2	86	21.9	435	62.6	508	36.9
Soy bean sauce	76	6.3	74	18.9	25	3.6	117	8.5
Seasonings except soy bean paste & sauce	35	2.9	14	3.6	21	3.0	43	3.1
Bean curd	89	7.4	126	32.1	84	12.1	490	35.6
Meat products	43	3.6	63	16.1	8	1.2	90	6.5
Milk	35	2.9	65	16.6	5	0.7	70	5.1
Dairy products except milk	11	0.9	32	8.2	9	1.3	21	1.5
Green tea (crude)	159	13.2	39	9.9	1	0.1	186	13.5
Green tea (refined)	134	11.1	26	6.6	1	0.1	174	12.6
Tea excpet green tea	67	5.6	18	4.6	5	0.7	107	7.8
Food boiled down in soy sauce	39	3.2	37	9.4	48	6.9	98	7.1
Others	279	23.2	49	12.5	57	8.2	166	12.0
Total	1,203	100.0	392	100.0	695	100.0	1,378	100.0

Table 2:
Food processing by agriculture cooperatives. Central Union of Agriculture Cooperatives (1991).

Code	Industry	Raio 1	Ratio 2	Capital	Variance
121	Livestock products	6.1	7.1		
1211	Meat products		4.3	342.03	15.02
1212	Dairy products		9.0	754.46	19.52
1219	Others		9.3	162.48	87.49
122	Seafood products	2.5	2.9		
1221	Canned fish and seafoods		2.3	188.18	188.18
1222	Seaweed products		2.2	72.05	72.05
1223	Agar-agar		n.a.	121.29	121.29
1224	Fish sausages		n.a.	572.57	572.57
1225	Prepared seafood products		7.6	141.44	141.44
1226	Frozen fish and seafoods		9.5	217.85	217.85
1227	Frozen seafood products		4.1	124.16	124.16
1229	Others		n.a.	65.69	65.69
123	Canned & preserved fruit & vegetable products	6.9	6.1		
1231	Except pickled vegetables		9.4	176.76	12.93
1232	Pickled vegetables		3.9	94.67	19.73
124	Seasonings	2.5	2.6		
1241	Soy bean paste		4.2	133.75	20.93
1242	Soy bean sauce		6.7	182.14	15.10
1243	Chemical seasonings		0.0	3110.11	218.75
1244	Sauce mix		0.0	627.21	94.81
1245	Vinegar		1.6	175.49	127.53
1249	Others		0.0	686.36	16.42
125	Sugar processing	4.2	n.a.		
1251	Cane sugar, except refining		n.a.	850.18	671.68
1252	Cane sugar refining		0.0	1591.34	36.01
1253	Glucose		0.0	1899.92	206.66
126	Flour & grain mill products	6.9	8.9		
1261	Rice polishing		22.0	313.67	172.42
1262	Wheat polishing		0.0	402.93	486.85
1263	Flour		0.0	1272.65	124.53
1269	Others		0.0	101.94	260.66
127	Bakery & confectionary products	0.6	0.0		
1271	Bread		1.2	283.04	13.16
1272	Cakes		0.0	113.21	20.31
1273	Biscuits and crackers		1.5	133.30	32.35
1274	Rice crackers		n.a.	161.09	14.13
1279	Others		n.a.	288.53	21.88
128	Animal & vegetable oil & fats	1.1	1.8		
1281	Vegetable oils		8.7	1443.42	46.86
1282	Animal oils		0.0	161.44	152.57
1289	Table oils			2969.57	413.07
129	Miscellaneous foods & related products	1.8	1.7		
1291	Yeast		9.8	316.98	452.90
1292	Starch		23.1	334.80	103.61
1293	Noodles		0.0	79.59	26.82
1294	Malt		n.a.	105.34	30.40
1295	Bean curd, fried bean curd		3.1	50.16	22.34
1296	Sweet bean paste		2.9	50.22	29.80
1297	Frozen prepared foods		3.0	332.60	65.81
1298	Prepared foods		0.0	144.49	55.11
1299	Others		n.a.	151.24	28.22
131	Soft drinks & carbonate water	7.9	11.8		
1311	Soft drinks & carbonated water		11.8	967.72	102.76
132	Alcoholic beverages	1.0	0.0		
1321	Wines		8.7	219.67	34.99
1322	Beer		0.0	16562.77	24.02
1323	Sake (Rice wines)		0.0	196.89	11.16
1324	Distilled & blended liquors		3.0	641.55	22.37
133	Tea & coffee	19.9	n.a.		
1331	Tea		n.a.	54.80	13.04
1332	Coffee		n.a.	418.90	169.81

Table 3:
Ratio 1: Employee ratio of cooperatives (%). Management and Coordination Agency (1998).
Ratio 2: Employee ratio of cooperatives (%). Ministry of International Trade and Industry (1998).
Capital: Fixed capital assets per establishment (million yen). Ministry of International Trade and Industry (1998).
Variance: Variance of rates of change in gross added values, 1988-1997. Ministry of International Trade and Industry (1998).

Note: Employees of firms in joint stock company form are not included in Ratios 1 and 2.

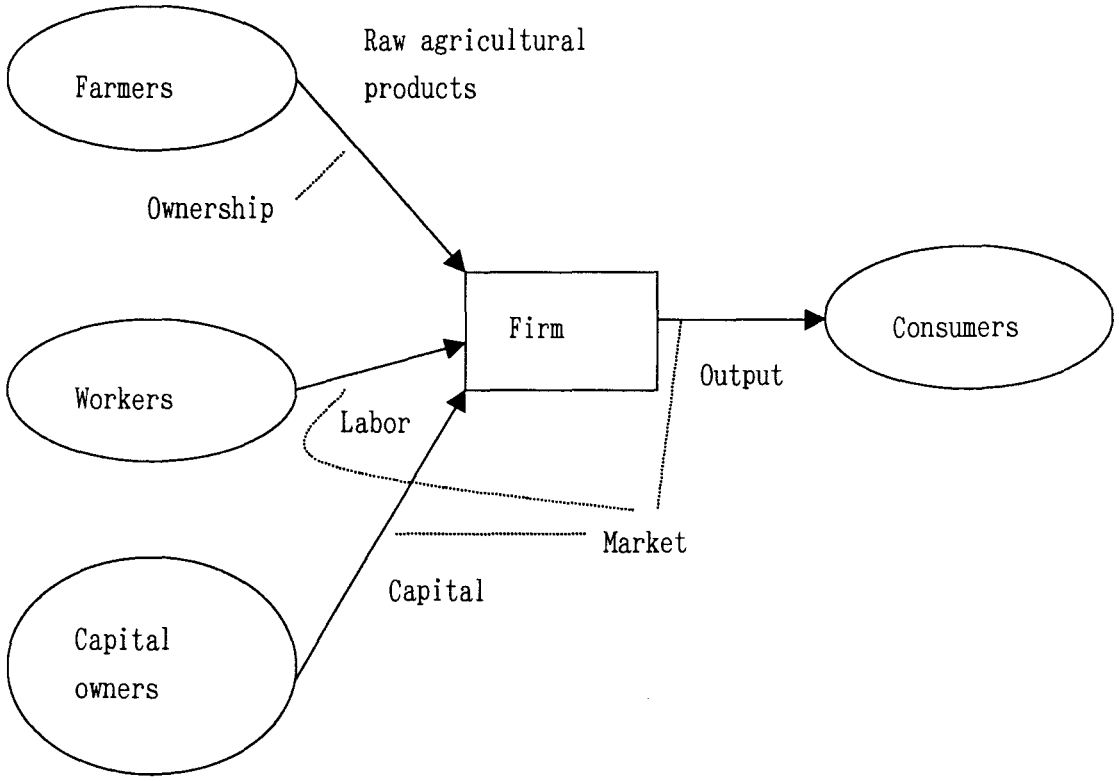

Figure 1: Ownership structure of a food manufacturing firm. Food manufacturing by an agriculture cooperative is the form of enterprise in which farmers own the firm as the suppliers of raw agricultural products, whereas labor input, capital input and output are traded through the market.