Vertical Coordination in the Agrifood Supply Chain: structure and strategy of the agricultural cooperative

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1. Introduction

Over the last decade, agrifood supply chains have been characterized by increasing vertical coordination. The key to vertical coordination is strengthening the link between production, processing and marketing activities in the supply chain. As these activities are usually carried by independent companies, vertical coordination requires some form of contractual agreement or (partial) ownership integration. As traditional market transactions cannot efficiently communicate the appropriate signals to producers and do not lead to consistency in producer responses, organizational solutions such as contracts and partial ownership have been used to strengthen the alignment of individual activities at different stages of the supply chain.

The need to strengthen vertical coordination results from a number of changes in the conditions of agrifood markets: consumers demand higher quality, more food safety guarantees, and more convenience; competition have become stronger due to globalization and saturated markets; the market power of food retail has increased due to more concentration; and all participants in agrifood chains have stepped up their effort in innovation and product differentiation in order to survive in those competitive market conditions. In general, changes in the market conditions urge all chain participants to become more market oriented and more responsive to customer demands.

Cooperatives are typically involved in marketing and processing farm products at the first stages of the supply chain. Consequently, they would seem well-positioned to organize vertical coordination between primary production, processing, distribution and marketing. However, cooperatives have
organizational features that may limit their ability to strengthen market orientation and customer responsiveness. Particularly their financial structure and decision-making structure may affect their suitability to play a major role in strengthening vertical coordination. Also their focus on obtaining the best performance in the first stage of the supply chain may cast some doubts on their ability to coordinate the full chain.

Still, cooperatives have developed new strategies and structures to deal with the new supply chain challenges. Given the continuing importance of cooperatives in processing and marketing farm products, they must have found ways to deal with the limitations that could weaken their position in the supply chain. This paper discusses the role of the agricultural cooperative in strengthening vertical coordination. It assesses the strengths and weaknesses of the organizational form, and it presents empirical information on how cooperatives in Europe have responded to the supply chain challenges.

The paper is structured as follows. In section 2 we present figures on the market share of cooperatives in marketing farm products for a number of countries in Europe. Although competition is increasing, cooperatives are holding strong in terms of their market share. In the next section (3) we discuss the traditional motives for farmers to establish and patronize cooperatives. Reducing transaction costs due to uncertainty (or asymmetric information), risks and asset specificity have traditionally been the most important explanations for the prevalence of cooperatives. Then, in section 4 we present the theory on coordination and coordination mechanisms. We argue that coordination among firms, such as those participating in a supply chain, is obtained by particular combinations of four different coordination mechanisms. Next we apply, in section 5, those theoretical notions on (vertical) coordination to the role of cooperatives in the supply chain, and discuss how cooperatives are reinforcing those functions that strengthen vertical coordination. This raises the question how the traditional organizational characteristics of the cooperative support or hamper the ability to improve vertical coordination in the supply chain. Answers to this question, focusing on the ownership and corporate governance structure of the cooperative, are discussed in section 6. Finally, section 7 presents some conclusions on the near future of the role of cooperatives in the agrifood supply chain, particularly on further processes of strategic reorientation and restructuring.
2. Cooperatives in Marketing Farm Products in Europe

Cooperatives have always been important in the European agrifood industry. As farmer-owned firms, providing services for their owners, they have been instrumental in the modernization of European agriculture over the last 50 years. Particularly marketing cooperatives have been crucially important for farmers, who depend for their income on the performance of the cooperative. Indirectly, cooperatives have been important for all farmers because their dominance has forced non-cooperative companies to offer farmers the same price and quality of services. The latter mechanism is the so-called yardstick argument, which is difficult to prove but intuitively appealing.

While marketing coops can be found all over Europe and for all agricultural products, they are particularly strong in North-Western Europe and for commodities like milk, meat, fruit and vegetables, and cereals (see Table 1). Cooperatives also have substantial market shares in the production of animal feeds and the retail of fertilizers, seeds, and farm equipment. Finally, in many countries the provision of agricultural credit is dominated by cooperative banks.

The importance of cooperatives in the marketing of farm products is not just a feature of the past. Comparing the 1995 with the 2003 figures in Table 1 shows that in most countries and for most products, the market share of cooperatives has remained stable or has even gone up.\(^1\) Also when we compare the figures in Table 1 with 1990 figures as presented by Mauget and Declerck (1996) we can draw the same conclusion on the strength of cooperatives in marketing farm products. For instance in the dairy industry, the industry for which most consistent data is available, cooperatives have increased their share of milk processing. France is the exception, as the cooperative share of the dairy market has decreased since the early 1990s.

\(^1\) The figures in Table 1 must be interpreted with care. Not only because the two main publications from which the figures are taken may have used different sources. Also, measuring the market share of cooperatives is not an easy task as there is no common methodology and there is no governmental body collecting these data. Most figures on market share are estimates by national associations or federations of cooperatives.
Table 1: Market share (%) of cooperatives in marketing farm products, 1995 and 2003

<table>
<thead>
<tr>
<th></th>
<th>Milk</th>
<th>Fruit and Vegetables</th>
<th>Meat</th>
<th>Cereals</th>
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<tbody>
<tr>
<td>Austria</td>
<td>90</td>
<td>94</td>
<td>n.a.</td>
<td>35</td>
</tr>
<tr>
<td>Belgium</td>
<td>50</td>
<td>50</td>
<td>70-90</td>
<td>85</td>
</tr>
<tr>
<td>Denmark</td>
<td>93</td>
<td>97</td>
<td>20-25</td>
<td>30</td>
</tr>
<tr>
<td>Finland</td>
<td>94</td>
<td>97</td>
<td>n.a.</td>
<td>12</td>
</tr>
<tr>
<td>France</td>
<td>49</td>
<td>37</td>
<td>35-50</td>
<td>45</td>
</tr>
<tr>
<td>Germany</td>
<td>20</td>
<td>68</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td>Ireland</td>
<td>100</td>
<td>97</td>
<td>n.a.</td>
<td>75</td>
</tr>
<tr>
<td>Netherlands</td>
<td>82</td>
<td>85</td>
<td>70-96</td>
<td>85</td>
</tr>
<tr>
<td>Sweden</td>
<td>99</td>
<td>90</td>
<td>60</td>
<td>45</td>
</tr>
<tr>
<td>UK</td>
<td>98</td>
<td>55***</td>
<td>35-45</td>
<td>50</td>
</tr>
</tbody>
</table>

Sources: 1995: Van Bekkum and Van Dijk, 1997; 2003: Juliá-Igual and Meliá, 2007; * Source: Duponcel, 2006; ** 1998 data; *** 1999 data; n.a.: not available

Marketing cooperatives can provide different services to their members, thereby limiting or extending their activities to one or more stages of the supply chain. We can distinguish between three categories of marketing cooperatives. First, a number of cooperatives just focus on collecting products and providing an organized market place. The grower-owned flower auction is a typical example of this function. The flower auction is organizing the sales process on behalf of the grower, enabling the latter to fully specialize in production. As the auction is able to attract many buyers, and uses the auction clock for price determination, a transparent and well functioning market results. In the Netherlands the cooperative flower auction is the dominant sales channel, accounting for the marketing of more than 95% of domestically produced cut flowers and potted plants.
A second group of marketing cooperatives consists of organizations that not only collect farm products but also bargain with customers over the proper price. These cooperatives are also known as bargaining associations, although they often perform additional functions such as storage, sorting and grading, and sheltering producers from (too high) market risks (e.g. by pooling seasonal products). This type of marketing cooperatives is used for selling grains and oilseeds, fruits and vegetables, and livestock. The producer organizations that are registered under the EU regulation for supporting the marketing of fresh produce (the so-called CMO regulation) fall within this category. The availability of EU subsidies for special marketing plans for fresh produce has led to an expansion in the number of marketing cooperatives in the fruits and vegetables industry (CEC, 2001; Duponcel, 2006).

The third group of marketing cooperatives consists of the farmer-owned processing companies. The dairy cooperative is a typical example, and can be found throughout Europe (see Table 1). For other farm products, there are major differences in the market share of cooperative processors among European countries. In pork processing, for instance, cooperatives have a dominant position in Denmark, while they have totally disappeared in The Netherlands. Producer-owned cooperatives can also be found in the processing of starch potatoes, sugar beets, olives, fruits and vegetables, poultry, cotton and tobacco (Juliá-Igual and Meliá, 2007). Finally, the European wine industry is well known for its many cooperative wineries (e.g. Chiffoleau et al., 2007).

3. Traditional Motives for Establishing and Patronizing Cooperatives

Traditionally, agricultural cooperatives have been established for reason of reducing risks and transaction costs. While many cooperatives also perform social functions, the economic motives for becoming a member of a cooperative prevail. Schrader (1989) lists the following economic reasons for farmers to engage in collective marketing: resolving market failure; benefiting from economies of scale; capturing profits at another level of the supply chain; assure market access; benefit from reduced risks; building countervailing power; and gaining from coordination. We will briefly discuss these argu-
ments, and illustrate them by referring to a marketing cooperative for fruits and vegetables.

3.1 Asymmetric Market Power

Imbalance of market power between farmers and their customers is the result of the large difference in minimum efficient scale of operation in farming compared to marketing or processing. In such oligopsonistic or even monopsonistic markets, farmers are likely to receive a lower price than they would under more competitive conditions. Cooperatives have addressed this asymmetry in market power by jointly purchasing inputs and jointly selling farm products, thereby establishing countervailing power. The marketing cooperative has a number of tools available to enhance the (collective) bargaining power of its members, such as negotiating contracts with buyers; collecting and sorting the products of the members; storing the products and selling in the high price season; and guaranteeing product quality.

3.2 Asymmetric Information

Another function of the cooperative related to market failure is reducing information asymmetries. In well-functioning (i.e., competitive) markets participants have full information regarding demand and supply, both on the quality and the quantity of products to be traded. However, this situation of full information disclosure rarely exists in real life, and most transactions are characterized by one party having more information than the other. Situations of asymmetrically distributed information between buyers and sellers can lead to abstention from trade or to the situation where only low quality products are traded. This is the classical information asymmetry problem posed by Akerlof (1970), leading to a loss of welfare. In agricultural markets the problem of hidden information can take the form of producers having better information on the real quality of the product or buyers having better information on final consumer demand.

Marketing cooperative have solved the problem of asymmetric information between producers and buyers in different ways. The problem of hidden information about product quality has been solved by introducing quality grades and standards, and by sorting and grading products into different quality classes. This has reduced the transaction costs (for the buyer) of
searching for proper products, thus improving the efficiency of the sales process. The problem of hidden information about consumer demand has been solved by installing market information systems or by hiring a sales agent whose function is not only to find buyers and negotiate a price, but also to collect market information.

When a cooperative appoints a sales agent it may run into a new information problem as it was very hard to evaluate the performance of the agent given the volatility in supply and demand (for instance due to weather conditions) but also given the perishability of the products. For a fruit and vegetables cooperative, having members that supply different products and different qualities, it is even more difficult to assess the performance of the sales agent. Moreover, with such a diverse membership the agent cannot satisfy each member equally, which may lead to distrust and conflict. In the Dutch fresh produce industry this double information problem – on market conditions and effort of the sales agent – was solved by establishing a producer-owned auction. By centralizing all supply and demand and by using the auction clock for price determination, the auction cooperative greatly reduces transaction costs between sellers and buyers. In addition to the efficiency obtained in the market, efficiency in production is also enhanced because producers can specialize in on-farm activities.

3.3 Sharing Risk

A cooperative is also an instrument for sharing risk. The more vulnerable producers are to the vagaries of nature or the whims of the market and the more risk averse they are, the more they seek risk reduction strategies. A marketing cooperative can reduce the market risks for the individual producer in several ways. It can reduce market risk by providing its members a guaranteed market. Cooperatives have the statutory obligation to sell any product that complies with the minimum quality standards (unless the bylaws stipulate differently). A private buyer would only buy the amount that was agreed to (in case of a contract), leaving the producer with any surplus for which it has to find another outlet (involving additional transaction costs). In addition, a cooperative may provide insurance to buyer default. In case a buyer is unable to pay (for instance in case of bankruptcy) the individual producer still receives his price and the cost are shared among all members. Moreover, the cooperative may use a pool for selling seasonal products.
While prices vary substantially over the year, the price the producer receives for his products is an average of the prices received for all sales transactions throughout the year. This sales mechanism is common in the potato industry as well as in the hard fruit industry.

3.4 Safeguarding Specific Investments

For many agricultural products there is only a small number of processors, due to the large economies of scale involved in processing (compared to small economies of scale in primary production) and due to the perishability and bulkiness of the farm product. Given these market and product characteristics, durable investments make the farmer dependent on the processor. By establishing a producer-owned processing company, farmers no longer face the risk that an opportunistic processor may take advantage of the farmer dependency. A typical example of this transaction cost reducing effect of (partial vertical integration) can be found in the dairy industry. As efficient milk processing involves significant economies of scale farmers are usually faced with a monopsonistic market structure. Interestingly, the dependency in dairy processing goes both ways. The processing unit is also fully dependent on the supply of milk from the surrounding farmers as other sources of milk are not available or only against high transportation costs. This symmetric dependency has often been mentioned as the explanation for the presence of many cooperatives in the dairy industry (Staatz, 1987).

In conclusion, the common characteristic of these traditional functions is that they reduce costs and solve market failures. By acting collectively, producers save on the costs of collecting market information, selling products, and reducing transaction risk. In addition, producers strengthen their bargaining power by collectively negotiating with buyers of their products and sellers of inputs. While these motives continue to be relevant, over the last two decades additional functions have become important. These new tasks relate to improving and guaranteeing quality, enhancing logistic efficiency, reinforcing information exchange, and strengthening innovation. While traditionally the focus was on cost reduction and bargaining power, these new tasks are more targeted at value creation, either at farm level or at the whole supply chain level. Value creation requires close coordination of the activities by farmers, cooperatives and other participants in the supply chain. The next section presents some basic thoughts on how to obtain coordination.
4. Coordination Mechanisms

Before we assess the strengths and weaknesses of cooperatives in enhancing vertical coordination in agrifood chains, we will first briefly discuss what coordination and more specifically what vertical coordination entails. Coordination is a basic process in society. When individual persons seek to benefit from specialization by focusing on one particular task, thus gaining task-specific knowledge and experience, different individual tasks have to be 'brought together' to obtain a combined result that has a higher value than just the sum of the individual results. Well-coordinated activities lead to efficient use of resources as well as to a good fit between the quantity and quality demanded and produced. The need for coordination is present at different levels of economic activity. It is important within firms, where better coordination leads to higher performance, as well as for the economy as a whole, where better coordination leads to higher productivity, higher efficiency, more customer satisfaction, and more innovation. Most economists focus on the role of markets and prices in obtaining coordination. The price is a 'sufficient statistic' for efficient transactions to take place as it contains the right information for sellers and buyers.

Organization scholars, however, have always claimed the limitation of prices and markets in obtaining coordination (e.g. Simon, 1991). In studying intra-organizational processes they have placed less emphasis on the allocation of resources and more on the interrelatedness of different tasks or activities, and on the organizational structures and organizational processes that support coordination between different tasks.

Coordination can be defined as managing dependencies between activities (Malone and Crowston, 1994). Often this dependency is two-ways: activity A and activity B are mutually dependent (or interdependent). Thompson (1967) distinguishes between three types of interdependence: pooled, sequential, and reciprocal. With pooled interdependence, each part of an organization renders a discrete contribution to the whole and each is supported by the whole. The parts are interdependent in the sense that unless they all perform adequately, the total organization is jeopardized. With sequential interdependence, the output of one part is the input for
another part. With reciprocal interdependence the output of each part becomes input for the other parts.²

Coordination can be obtained by applying one or more coordination mechanisms. According to Thompson (1967), each type of interdependency requires a different coordination mechanism: with pooled interdependence, coordination by standardization is appropriate; with sequential interdependence, coordination by hierarchical control (called ‘plan’ by Thompson) is appropriate; and with reciprocal interdependence, coordination by mutual adjustment is called for. The three types of coordination, in the order presented here, place increasingly heavy burdens on communication (information exchange) and decision-making. While Thompson refers to intra-organizational coordination, these concepts of interdependencies and coordination mechanisms also apply to inter-organizational relationships.

Mintzberg (1979) has further elaborated on these coordination mechanisms, distinguishing between mutual adjustment, direct supervision, and several forms of standardisation (of work processes, outputs, skills and norms). Mutual adjustment implies that coordination is achieved by the simple process of informal communication. Direct supervision means that one person issues orders or instructions to several others whose tasks are interrelated. Standardization of work processes leads to coordination because it specifies the work processes of people carrying out interrelated tasks. Standardization of outputs achieves coordination by specifying the results of different tasks. Standardization of skills means that different activities are coordinated by virtue of the training the workers have received. Finally, standardization of norms implies that coordination is obtained by common norms (and beliefs) in the organization.

Combining economics and organization theory results in four basic approaches to obtaining coordination (see Figure 1). The first coordination mechanism consists of price and market, where individual choices are ‘guided’ by the so-called invisible hand of the market and where the price is the main information carrier. The second coordination mechanism consists of hierarchy, where a central decision-maker directs the activities of individuals

² What Thompson calls reciprocal interdependence is known in economics as complementarities: the value of performing one activity is a function of the performance of the other activity (Milgrom and Roberts, 1995).
via direct supervision (or administrative control). The third is the community approach, where coordination is obtained through common norms, shared identity, habits and routines, or different standardization processes (Mintzberg, 1979). Finally, the fourth approach to coordination results from direct personal interaction about how to align individual activities, and the bilateral or multilateral agreements made in the group. The latter type of coordination is particularly present in contract negotiations, project teams, and group decision-making.

These four mechanisms can be plotted along two axes. On the vertical axis we find the extent of formalization of agreements, ranging from coordination only by informal norms, shared values, and routines as one extreme to coordination only by formal rules that are bilaterally or multilaterally agreed upon. The distinction between formal and informal institutions of governance has recently received quite some attention in the economic organization literature (e.g. Poppo and Zenger, 2002; Zenger et al., 2002). The horizontal axis indicates the use of outcome-based or behavior-based incentives. On the one hand we find coordination in a pure (spot) market, where price is the only coordination mechanism; on the other hand we find coordination obtained internally in an organization making use of such organizational devices as hierarchy, direct supervision and giving commands. Coordination in real transactions is always the result of a combination of those four mechanisms. Even a spot market includes informal coordination by the users as well as formal coordination through relevant public policies.

This distinction between four different coordination mechanisms helps to better understand how different governance structures (or governance forms) are able to coordinate particular transactions. In Transaction Cost Economics, the central premise is that firms choose (or develop) the most efficient governance structure for their transactions (Williamson, 1985). Depending on the characteristics of the transaction, the partners involved, and the institutional environment in which the transaction is carried out a particular combination of coordination mechanisms will lead to the lowest transaction costs. However, only particular combinations of coordination mechanisms can be found in reality, leading to the assumption that only specific combinations lead to efficient outcomes. The cooperative is a hybrid governance structure (Ménard, 2007) with a particular combination of coordination mechanisms that has proven its viability over the years.
Coordination requires gathering and processing information, making decisions, and communicating these decisions. The stronger the interdependence among activities carried out by different persons or firms, the greater the amount of information they must process (Galbraith, 1977). Coordination requirements lead to coordination costs, which go up when coordination becomes more difficult. Coordination problems arise due to the lack of shared and accurate knowledge about the decision rules that others are likely to use and how one’s own actions are interdependent with those of others (Gulati et al., 2005). Coordination costs are higher in uncertain or volatile environments compared to stable environments. When supply, demand, prices, technology, state policies, or other environmental factors are subject to rapid and unpredictable change, coordination becomes more difficult and therefore more costly. By shifting to (or adding) another coordination mechanism, organizations can reduce the coordination costs.

From this brief discussion of coordination theory we can now draw two conclusions that are relevant for the role of the cooperative in agri-food supply chains. First, when the demand for coordination goes up, for instance when activities by different actors become more interdependent,
more information exchange is needed. A coordinator of a complex process/program consisting of different non-standard complementary activities, needs to collect and process detailed information on each of these activities. After taking a decision the coordinator has to provide each actor with the proper information to enable him/her to take the right actions. Second, when the activities of individual actors become more centralized interdependent there is need for more centralized decision-making to make sure that all individual but complementary actions are sufficiently aligned.

5. Vertical Coordination and the Role of the Cooperative

In section 4 we have discussed the issue of coordination in general. However, for this paper we are particularly interested in vertical coordination. Agrifood supply chains are commonly characterized by sequential vertical transactions. The coordination challenge in a supply chain is not only to align the activities of the farmer with those of the processor, and of the processor with those of the retailer, but also to coordinate the transaction between farmer and processor with the transaction between processor and retailer. In other words, the agrifood supply chain is characterized by sequential interdependence.

Vertical coordination in agrifood supply chains (or value chains) has become more important, for a number of reasons (Royer and Rogers, 1998; Galizzi and Venturini, 1999; Hobbs and Young, 2000). First, consumers are demanding higher quality, without willing to pay more. Quality includes food safety, environment friendly, animal friendly, etc. Second, in response to several food crises, governments have introduced more strict food safety legislation. Third, technology has made markets more transparent, has increased competition, and has made supply chains more international. Also advances in logistic technologies have increased competition from distant production areas. Finally, market structures in the food processing and food retailing industry has changed dramatically. Particularly in food retailing, supermarket ownership has become very concentrated (Clarke, 2002). These changing market conditions, new technologies, stricter legislation and more quality conscience consumers has led to strategic reorientation of the agrifood industry. Cooperatives and non-cooperative processing and marketing firms now apply strategies targeted
at more innovation, more product differentiation, improved logistic efficiency, higher product quality and more quality monitoring (including guaranteeing food safety). These strategies require more collaboration and coordination among the different participants in the supply chain.

Traditionally, the cooperative as an organizational form is characterized by pooled interdependence: each member has an individual transaction relationship with the cooperative firm but not with each other. Still, the performance in the individual transaction depends on all transactions together, through economies of scale in processing and marketing. When vertical coordination in the supply chain becomes more important, transactions in the cooperative shift from only a pooled interdependence towards a combination of pooled and sequential interdependence. The sequential interdependence appears because the transaction between member and cooperative firm has to be coordinated with the transaction between cooperative and its customer (e.g., a secondary processor or a retailer). Strengthening the coordination between these two sequential transactions is the main challenge for the cooperative in the supply chain.

How do cooperatives deal with this need for more vertical coordination? What new functions have they started? How are they dealing with the increasing coordination costs? Have they implemented changes in their coordination mechanisms? Do cooperatives encounter particular structural barriers to improving vertical coordination in the supply chain? The following section tries to answer these questions on the basis of theoretical and empirical literature on changing strategies and structures of agricultural cooperatives.

5.1 Information Exchange

While collecting and processing market information has always been one of the functions of the cooperative, targeted information exchange has become more important as part of the need to strengthen vertical coordination. Bijman (2002) found that the restructuring of the traditional vegetables auctions in The Netherlands was to a large extent due to the limited options that the auction offered for information exchange between sellers and buyers. The traditional auction functioned well as long as all information was of a generic type, but it was not equipped to transfer information specific to a bilateral trading relationship.

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When processors need information on products and production methods, in order to schedule their own processing and marketing activities, cooperative bargaining organizations may be helpful to provide this information. Through having this information collected and exchanged by a cooperative, farmers and processors can economize on coordination costs. Hueth and Marcioul (2003) found that one of the reasons for the existence of bargaining cooperatives in the US vegetables industry is that they are able to share production information with processors that would otherwise be costly to obtain.

Cooperatives have competitive advantages as to solving the problem of asymmetric information about specific product quality characteristics. Producers have better information on product quality, particularly on quality characteristics that are directly related to on-farm production methods, such as in organic production or products of regional origin. The quality of these so-called credence attributes is hard to measure for the buyer. For this reason, buyers may not be willing to pay the appropriate price. When sellers set up a collective marketing organization, this cooperative may use its reputation as a trust-worthy supplier (because it has an ongoing interest in keeping good relations with customers and consumers), to guarantee the promised quality and thus encourage consumer to pay the higher price. As there is no conflict of interest we do not expect producers to cheat on their own cooperative.

Besides providing product and production information to processors, traders and retailers, cooperatives also collect and process market information for their members. Increasingly, this activity also includes collecting and transferring demand information from specific customers. Cooperatives, just like their non-cooperative competitors, are trying to become preferred suppliers of specific processing or retail customers. Once being a preferred supplier, the information exchange function is no longer limited to exchanging general market information, but increasingly includes the specific requirements of those customers.

In sum, we expect that the need for more vertical coordination in agrifood chains leads to the following (coordination) strategies of the cooperative. First, it will lead to enhanced effort of the cooperative in collecting, processing and distributing information. Second, cooperatives increasingly perform a brokerage function between customers and producers, resulting in more restriction for producers on their individual choices on what and how much to produce. Third, cooperatives will try to establish
direct trading relations with major retailers, in order to shorten the information chain between producers and final customers/consumers. Fourth, we expect that organic products and products of regional origin, given the information advantage of the producers, are marketed by cooperatives instead of investor-owned firms.

5.2 Quality Assurance

Are cooperatives able to provide the quality assurance that customers demand, and if so, do they have a comparative advantage or disadvantage compared to non-cooperative firms? Processors and retailers increasingly demand the disclosure of detailed information on the production processes applied on the farm; in some countries also legislation requires disclosure. Generally, one cannot expect farmers to be enthusiastic about providing this information, not only because of the paper work involved, but also because it entails a limitation on the freedom to operate the farm. However, when the requirement to disclose detailed information on production methods is issued by the producer-owned cooperative, farmers may be more likely to provide this information because there is no conflict of interest between members and the cooperative.

Quality assurance does not only involve grading and sorting by the cooperative. It also entails helping farmers comply with particular quality requirements. The cooperative, as a member-owned organization, is well-positioned to provide their members with all necessary information and technical assistance. In a number of countries, cooperatives are only to a limited extent involved in providing technical assistance to their members because there is a well-developed public extension service or there is a well-developed private technical consultancy industry (sometimes grown out of a privatized public extension service). However, as coops become preferred suppliers, and production technology becomes less generic, one may expect that cooperatives themselves become involved in organizing technical assistance. Ménard and Valceschini (2005) present a case study of a cooperative in the French tomato industry that defines the quality requirements, provides technical support, collects and selects the products, and takes care of the packaging.

One of the changes in market conditions for agrifood products is the shift from public quality standards to private quality standards (Henson and Reardon, 2005). Large retail companies are known to have individual or
collective (such as EurepGAP) quality assurance systems. Often these private standards go beyond the requirements of public standards. This implies that cooperatives supplying to those supermarkets will become involved in helping their members comply with these quality assurance systems.

Verhaegen and Van Huylenbroeck (2002) in their Belgium study on new quality initiatives by agricultural producers found that these producers often set up cooperatives in order to coordinate both horizontally among the producers (to get homogeneous quality products) and vertically between producers and customers (in order to align the supply and demand of high quality products).

5.3 Branding

Producers can improve their communication with consumers and at the same time try to strengthen their competitive position vis-à-vis retailers by building a consumer brand. However, the investments are substantial, long-term and risky. Many cooperatives cannot afford these investments. Still, in some situations it may be easier for a cooperative to establish a brand name than it would be for other firms. In those cases where the quality of the branded product is crucially dependent on the effort of the producer (e.g. in the case of regional specialties or organic products), no other chain actor is willing to invest in a brand name. A brand is a typical example of asset specificity (Klein et al, 1978), which means that production of the branded products and brand ownership should be combined in order to reduce transaction costs (in this case the costs of safeguarding the investments in brand building). For the farmers who produce regional specialties or organic products this all means that they should be the owners of the brand under which their products are sold. Because farmers individually are too small to establish and maintain a brand, they do so collectively in a cooperative. This proposition about the advantage of the cooperative in building a brand for particular products is supported by an empirical study by Raynaud et al. (2005) who found that consumer brands for high quality agricultural products are often owned by cooperatives.

Does the organizational structure of the cooperative affects the marketing of the cooperative's products or the establishment of a brand? Nilsson et al. (2007) have investigated whether being a cooperative has an added value in marketing the products of the cooperative. They found that consumers have
positive attitudes towards cooperatives. They suggest there are good options for cooperatives to use their business form as a marketing tool, particularly by established cooperatives, mentioning ‘cooperative’ in conjunction with other quality attributes, and by local cooperatives trying to build a brand for products of local origin. Beverland (2007) examined the ability of traditional and new generation cooperatives to develop and support market-based assets including brands and long-term relationships with channel buyers in order to develop a sustainable position for their members and increase returns. His findings suggest that traditional cooperatives may be able to develop innovative marketing programs but struggle to support them over the long-term due to problems in ownership structures. The new generation cooperatives studied had more sustained long-term success, as members were able to capture the equity of intangible assets such as brand value, thus ensuring they undertook actions (such as channel support) consistent with building a sustainable long-term positioning.

In sum, we expect that cooperatives will reinforce their effort in building consumer brands as part of the development towards more vertical coordination. In addition, we conjecture that cooperatives with consumer brands will strengthen their control over the production stages of the supply chain in order to protect their brand equity.

5.4 Innovation

Tight coordination between the production activities of the growers and the marketing activities of their customers may improve the efficiency of the supply chain, and may also foster innovation in the chain. Innovations that require adjustments in operations at different stages of the supply chain are so-called system innovations (Teece, 1988). The quintessence of a system innovation is that it can only be successful when different independent actors contribute to the innovation process. In the case of an agrifood chain, new product developments often require a contribution from input suppliers (new inputs), farmers (new farming methods), processors (new processing techniques) and retailers (new marketing approaches). Obtaining such chain innovations requires a coordinator who will take up the task of exchanging information among all partners and making decisions that impact all. The marketing or processing cooperative occupies a central position in the supply chain for coordinating complementary adjustments in production and mar-
keting. In order to perform this coordinator role for chain innovations, the cooperative is likely to apply more centralized decision-making procedures as well as more monitoring of member activities (Royer, 1995).

Cooperatives have a competitive advantage when the innovation consists of a so-called “inherently functional food” (Bröring, 2008). Such functional foods are not just fortified or enriched by simply adding a functional ingredient to a food product during the manufacturing process, but are naturally grown by altering the whole livestock production process. An example is the introduction (in 2007) by the Dutch dairy cooperative Campina of a new milk product with more unsaturated fatty acids. Campina does play a central role in this project as it controls most of the value chain activities. This high level of control seems to be needed in order to account for product quality. Farmers who participate in this program need to obey to a special feeding program which they can source-in from certain “Campina-approved” feed producers. Bröring suggests that to change the behavior and production processes at farm level might have been easier since Campina as a cooperative is jointly-owned by its member-farmers.

We may expect the following developments among cooperatives that pursue innovations in the supply chain. First, they will step up their effort on product innovation, particularly on chain innovations. These types of innovation require strong coordination among the activities and investments at different stages of the supply chain. The cooperative is the central coordinator for this type of innovations. Second, the initiation and implementation of chain innovations require more centralized decision-making, which leads to a reduction of the individual freedom of the participating farmer.

Now let us focus on the type of coordination mechanisms that are applied by the cooperative in the strengthening vertical coordination in the supply chain. Based on the need for more information exchange and more centralized decision-making, we can develop the following propositions. First, we expect that a shift from public standards towards private standards would entail a shift from community coordination towards contractual coordination. While communities reveal community-specific information, contracts are better in exchanging actor-specific information. Also the need for higher quality assurance requires more information exchange. Second, contracts are not only better for bilateral information exchange, they are also better for hierarchical decision-making. Stinchcombe (1985) has argued that contracts are typically
hierarchical tools in governing inter-organizational relations. Thus, more vertical coordination will not only lead to a shift from community to contractual governance, but also from market coordination to hierarchical coordination, either in contracts (as a form of hybrid governance structure) or in some form of (partial) vertical integration. It is well known from organization theory that organizations have more powerful control and monitoring mechanisms available than do markets because of their ability to measure and reward behavior as well as outcome (Eisenhardt, 1985). Finally, as product innovation and system innovation has become more important, we would expect to see a shift from market to hierarchy coordination. In sum, to strengthen vertical coordination cooperatives will show a shift from community to contractual coordination and from market to hierarchical coordination (see Figure 1). These shifts have implications for the organization of agricultural cooperative. In the next section we will discuss what changes in the organization (or structure) of the agricultural cooperative can be already seen or can be envisioned for the near future.

6. Cooperative Restructuring to Support More Vertical Coordination

So far we have discussed the supply chain strategies that agricultural cooperatives in Europe are following or are expected to follow in the near future. Decision-making on and implementation of these strategies may be hampered by a number of organizational characteristics of the cooperative. For this reason, several cooperatives have started a process of organizational restructuring in order to enhance market orientation, innovativeness, consumer responsiveness and vertical coordination in the supply chain. Before discussing these restructuring processes we will first briefly introduce the specific organizational features of the farmer-owned cooperative.

6.1 Characteristics of the Cooperative

An agricultural cooperative is a firm that is jointly-owned by farmers. The main purpose of the cooperative is to support these farmers in their individual farming activities. Such services can be supplying inputs (e.g. fertilizers or animal feed), providing rural credit and insurance, marketing farm products, processing farm products, and providing technical assistance. These
activities have a minimum efficient scale well beyond what is feasible for the individual farm. By organizing these activities through a jointly-owned firm, farmers benefit from economies of scale while keeping transaction costs low because they have control over the execution of these activities. In addition, by purchasing and selling collectively, farmers have established countervailing power vis-à-vis sellers and buyers that are much larger and therefore have more market power.

A commonly used definition of a cooperative comes from the International Cooperative Alliance (ICA): “A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically-controlled enterprise” (see: www.ica.coop.org). This definition indicates one of the most interesting and at the same time most challenging characteristics of the cooperative: its double nature (Draheim, 1955). A cooperative is both an association of members and a firm in which economic activities are carried out. The association is the locus of collective action, while the firm provides the actual services to the members. Making this distinction can be helpful to understand the process of cooperative restructuring, as economic conditions and societal trends have differential impact on the association and the enterprise.

Over the years the members of the agricultural cooperatives in Europe have transformed from farming families into farming firms. Members of the cooperative can now be considered as member firms (MFs), who jointly (i.e. through the association) own the cooperative firm (CF). Conceptualizing the CF as a service provider working for the benefit of the MFs does not mean that the CF has no self-interests. Indeed, shifting to a more market oriented strategy implies that the CF no longer considers itself as a purely dependent firm, and increasingly emphasizes its own role and responsibilities with regards to other participants in the supply chain and ultimately to consumers.

In much of the literature on agricultural cooperatives a three-fold relationship between members and their cooperative is used, emphasizing the role of the member of user of the services provided by the CF: user-benefit, user-control, and user-ownership (Barton, 1989). User-benefit means that the members are the primary stakeholders to benefit from the cooperative, and that this benefit is obtained by (individually) using the services of the
cooperative. User-control indicates that the rights to decide what strategies and policies the CF will follow ultimately lies with the users. In practice a board of directors, chosen by and from the members, is taking the strategic decisions. User-ownership signifies that the equity capital needed to run the CF is provided by the users.

This distinction in the relationship between members and cooperative is useful to clarify a number of other organizational characteristics of the cooperative. First, there is an order of importance in these three elements; user-benefit is the most important one, while user-control and user-ownership are subordinate to the benefit relationship. Control over and ownership in the cooperative should be considered as tools to obtain the benefits. Second, and most importantly, while the user-benefit relationship is an individual one – as farmers individually patronize the cooperative – the control and ownership functions are performed collectively. The latter means that farmers collectively decide on the activities and investments of the CF, and that the property rights to the assets of the CF are collectively owned. Defining ownership in a firm as the combination of control rights (or decision-rights) and income rights (Hansmann, 1996), one can observe that income rights are held individually, while decision-rights are held collectively. As we shall argue below, these particular organization characteristics have consequences for the extent and content of the vertical coordination strategies by the cooperative.

6.2 Organizational Restructuring

What type of organizational restructuring have cooperatives followed in order to be able to respond optimally to the need for more market orientation and more vertical coordination? This question can best be answered by using the threefold relationship between members and cooperative firm: member-benefit, member-ownership and member-control.

The above described vertical coordination strategies of cooperatives should first be considered as changes in the transaction relationship between MFs and CF. Innovation, quality assurance, market orientation, and customer responsiveness all entail a shift of control over the transaction from the MFs to the CF. A CF that has become a preferred supplier to a large retailer, that has built a consumer brand, and that has invested in a reputation of supplier of high quality products, has a large interest monitor and controlling its supplies. Thus
the CF will strengthen its control over the transactions between MFs and CF. This goes beyond monitoring product quality and extends towards monitoring the production processes of the MFs (particularly for products with quality characteristics that crucially depend on the effort of the farmer).

However, the shift from producer orientation to market orientation does not only have implications for the transaction (or patronage) relationship between members and cooperative. It also affects the decision-making processes in the cooperative and it often has implications for the financial structure of the cooperative. This issue of financial structure or ownership structure has been studied by a number authors, notably Cook (1995), Nilsson (1999) and Chaddad and Cook (2004). They all describe the innovative ownership models that cooperatives in Europe and North-America have developed to either strengthen member willingness to invest in the cooperative or invite external investors.

One of these models is particularly interesting for our argument as it not just raises additional equity capital but also entails a shift of decision-rights away from the farmer-members towards the managers of the CF (and the subsidiaries of the CF). In the so-called Coop-Plc model (Harte, 1997; Nilsson, 1999) or Irish Model (Chaddad and Cook, 2004) the cooperative has not only invited outside investors to participate in a subsidiary of the CF, it has also obtained a stock market listing for this cooperative, in order to make the shares tradable. While most or all of the activities and assets are transferred from the cooperative to the Plc-firm, the cooperative remains in place as a shareholder organization, representing its member interests. Although the cooperative initially is majority shareholder, the model opens the option the cooperative becomes a minority owner when the public listed subsidiary is issuing new shares. Examples of this Irish model of cooperative restructuring are the dairy cooperative Kerry (stock listing already in 1986); the supply cooperative IAWS (in 1988); the dairy cooperatives Avonmore and Waterford (both in 1989; in 1997 they merged and became Glanbia); and the dairy cooperative Golden Vale (in 1989; acquired by Kerry in 2001).

Van Bekkum and Bijman (2007) also describe a Finnish model of cooperative restructuring. Three primary products cooperatives from Finland also brought their subsidiaries to the stock market but have retained a controlling stake in these companies through the introduction of a separate
class of shares, exclusive to members and which carry stronger voting rights. Two of these cooperatives are minority shareholders in terms of number of shares, but still retain the majority of the votes: Metsäliitto has 38% of the shares of its subsidiary M-real (listed in June 1987), but retained 60% of the voting rights; and LSO Cooperative has 37% of the shares in HK Ruokatalo (listed in February 1997), but 84% of the voting rights. The third example of the Finnish model is the meat company Atria Group. The three cooperatives that have founded the Atria Group maintain a majority position both in number of shares (58%) and voting rights (92%).

Introducing these ownership models are a major part of the restructuring processes of cooperatives. Although they are related to the new vertical coordination strategies they are primarily meant to solve financial limitations of the cooperative business form. In this paper we will focus in the restructuring of the decision-making processes, particularly on shifts in the internal governance of the cooperative.

Decision-making in the cooperative is characterized by democratic procedures, in which all members have a vote and all members are eligible to become elected as member of the board of directors. Democratic decision-making has advantages and disadvantages. It has implications for the speed of reaching an agreement and the quality of the decision. Generally, democratic decision-making requires more time to reach a decision compared to autocratic decision-making. Therefore, the latter has coordination advantages compared to democratic decision-making. A second disadvantage of the democratic decision-making process is that it holds the possibility that a majority of the members, contributing only a small part of patronage of the cooperative, imposes policies that exploit a minority consisting of, for instance, large patrons (Staatz, 1987). Democratic decision-making also has advantages, which relate to the quality of the outcome and the effectiveness of implementing decisions. Reynolds (1997) argues that consensus decision-making, which is quite common in boards of agricultural cooperatives, offers the opportunity to combine different perspectives and

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3 In Dutch cooperative vegetable auctions in the 1980s and early 1990s, the majority of small producer-members refused to let the auction facilitate innovative business relationships between particular (groups of) growers and particular clients (Bijman, 2002).
different experiences. In addition, consensus governance makes implementation of policies easier.

How the advantages and disadvantages of collective decision-making in agricultural cooperatives balance out, depends on the competitive conditions. In a stable and/or protected market, cooperatives may have clear advantages. In a more dynamic environment, the disadvantages of the collective decision-making model may become more constraining as to the strategic flexibility that is needed. Slow decision-making becomes more serious when the volatility in the environment increases, such as when market protection is reduced and foreign competitors enter the market. Also when customers demand more innovative products, cooperatives may be at a disadvantage as they have a tendency to avoid new business directions and risky investments (this has been named the 'business as usual' trap; Reynolds, 1997). As new initiatives often have uneven or selective benefits among the membership, the safest option is to avoid rocking the boat. This, in turn, may undermine cohesiveness, as it discourages innovative producers to continue their membership. Producers who have adopted new technologies or production practices want a linkage to value-added processing or marketing systems to maximize benefits of the on-farm innovations.

6.3 Cooperative Corporate Governance

Another organizational characteristic of the cooperative that may become a liability in rapidly changing markets is the fact that farmers, as members of the board of directors, take the major decisions. Farmers often lack sufficient knowledge of how and where to guide the CF in terms of marketing and innovation. This problem is particularly serious in large, diversified cooperatives (Cook, 1995). Insufficient expertise may lead to inefficient strategic decisions and to suboptimal control of the management.

As argued above, cooperatives seek to strengthen vertical coordination as part of their strategy to become more customer oriented. This means that in (strategic) decisions of the cooperative, customer interests and member

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4 For instance, the large Dutch dairy cooperatives have long refused to accept organic milk. Members that wanted to shift from mainstream to organic milk were forced to leave the cooperative and find another outlet for their milk.
interests will both be taken into account. It is the task of the professional management to ensure that customer interests are sufficiently served, even when they conflict with (short term) member interests. We expect that cooperatives aiming for supply chain integration will experience more difficult decision-making as member interests are no longer the only (or even the main) guiding principle.

When cooperatives become larger and more customer-oriented, the distance between the association part and the firm part of the cooperative increases. Particularly the professional managers of the firm demand sufficient room for entrepreneurial initiatives. This means that the relationship between the board of directors (as representatives of the membership) and the management may change from a situation where the board takes strategic decisions and management takes care of execution, to a situation where management takes the strategic decisions and the board’s main function is supervision and ex post control. The new role of the board may become one of endorsing the strategic plans presented by the professional management and then defending these plans among the membership.

Hiring and keeping good managers may be a problem, particularly for a marketing cooperative. First, managers cannot receive incentives in the form of shares in the company. Second, cooperative business may not be perceived as trendy or sexy. Third, because the performance of the cooperative should be measured in terms of member benefit and not in terms of profit, market share or growth, managers cannot easily show their successes in their peer groups. This makes cooperative firms less attractive to certain ambitious managers. Fourth, as cooperatives in general follow prudent growth strategies, often staying close to the activities and products of the members, they are less attractive employers for a particular group of entrepreneurial managers.

Changes in the size and the strategy of the cooperative may have a number of repercussions for managing and controlling the CR. As few empirical studies on this issue have been conducted, we may conjecture the following developments when cooperatives embark on more market oriented strategies. First, the directors, as chosen from among the members, generally do not have the marketing knowledge that is required. Thus, professional marketing management will be hired. Second, even without a strong focus on marketing the large and diversified cooperative requires professional
management expertise that board members do not necessarily possess. Third, as the cooperative grows, internationalizes and diversifies, there is a large chance that the interests of the members in all of these activities diverge. As a result, strategic decision-making may become more laborious and/or members become less committed. Fourth, and probably most importantly, when companies become large and diversified they require top-managers of a kind that is only limitedly available; moreover, these managers demand a degree of autonomy from direct interference in company activities by the board of directors. Giving managers higher discretion and more autonomy is in line with traditional organizational theory's prediction that decision-rights should be allocated to those actors that have the knowledge to take those decisions. Having such autonomy is an important element of the intrinsic rewards that top-managers prefer as incentive for their effort. In sum, we expect market oriented cooperatives to hire top-managers which require the board of directors to shift its role from directing towards supervising.

One of the examples of restructuring corporate governance in Dutch cooperatives is the introduction of the so-called corporation model (Figure 2). This model is similar to the above described Irish model, but without the stock listing. However, the main reason for cooperatives to choose the corporation model has not been the need to acquire addition equity capital (as in the Irish case) but has been the perceived need to give the management of the CF more autonomy (and thereby to attract highly qualified managers). In the corporation model the CF takes the legal form of a Plc or Ltd and all of the activities and assets of the cooperative are placed in this Plc or Ltd. The CF is now legally separated from the association, although the association remains the 100% shareholder of the firm. One of the main characteristic of the corporation model, in terms of corporate governance, is that the board of directors of the association is also the supervisory board of the CF; there is no longer a separate supervisory committee at the level of the association. It is a simple model in terms of corporate governance as there is only one supervisory body, which has to take into account both member interests and firm interests. Several large Dutch agricultural cooperatives have obtained this legal structure over the last 15 years, such as Friesland Foods, Campina, and The Greenery.

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5 This legal structure makes it much easier for outside investors to invest in the CF.
7. Conclusions

In their ambition to respond to retail and consumer demands and better compete with non-cooperative firms, cooperatives in North-West Europe are applying new marketing strategies that require them to strengthen vertical coordination in the supply chain. Stronger vertical coordination entails more and better information exchange as well as more centralized decision-making. In terms of coordination mechanisms this means that the cooperatives are shifting from community to contractual governance and from market to hierarchical governance. The latter also includes giving the management of the CF more decision-rights over logistics, innovation, quality control and sometimes even volume control. This all implies that the CF obtains more control over the transaction relationship between MIs and CF.

Empirical research supporting the above conjectures is very limited. Kyriakopoulos et al. (2004) found that market orientation correlates with differential pricing and cost allocation mechanisms in cooperatives. These mechanisms imply heterogeneity among the membership of the cooperative. In such situations we expect to see a shift from democratic (or community) decision-making towards more hierarchical decision-making. In practice, this means more decision-making authority for the management of the CF. Verhaegen and Van Huylenbroeck (2002), in their study on governance structures for quality food chains in Belgium, found that the higher the investment in
the brand, the more decision-making in the cooperative became centralized and the more behavior-type of governance mechanisms were applied by the cooperative in its transactions with the producers.

The current and future shifts in coordination mechanisms, needed to strengthen vertical coordination, raise a number of interesting research questions about the viability of the cooperative model. Does the shift towards more hierarchical and contractual governance mechanisms lead to a loss of social capital, and thereby of member commitment? Is there a trade-off between commitment and coordination? Can we establish a maximum size of the cooperative for which social mechanisms (i.e. community coordination) combine well with the need to strengthen centralized decision-making? Does the brokerage function of aligning producer interests and customer interests lead to lower member trust in the CF, and if so, how can that be countered?

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