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Living apart together: How are member–cooperative relationships changing within European dairy cooperatives?

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Abstract

Recent developments in European dairy policies and dairy markets are posing challenges for dairy cooperatives, because they are affecting interest alignment between milk producers and cooperative management. We describe recent changes in policy and market environments and explore the impacts these changes may be having on farmers and cooperative businesses as separate but related entities. We argue that these policy and market developments are producing economic incentives that are increasingly difficult to align within dairy cooperatives, because they induce fundamentally different strategies of integration at different levels of the dairy value chain. The future of dairy cooperatives, we conclude, will be shaped by their ability to respond to the new business climate with varying combinations of vertical and horizontal integration.

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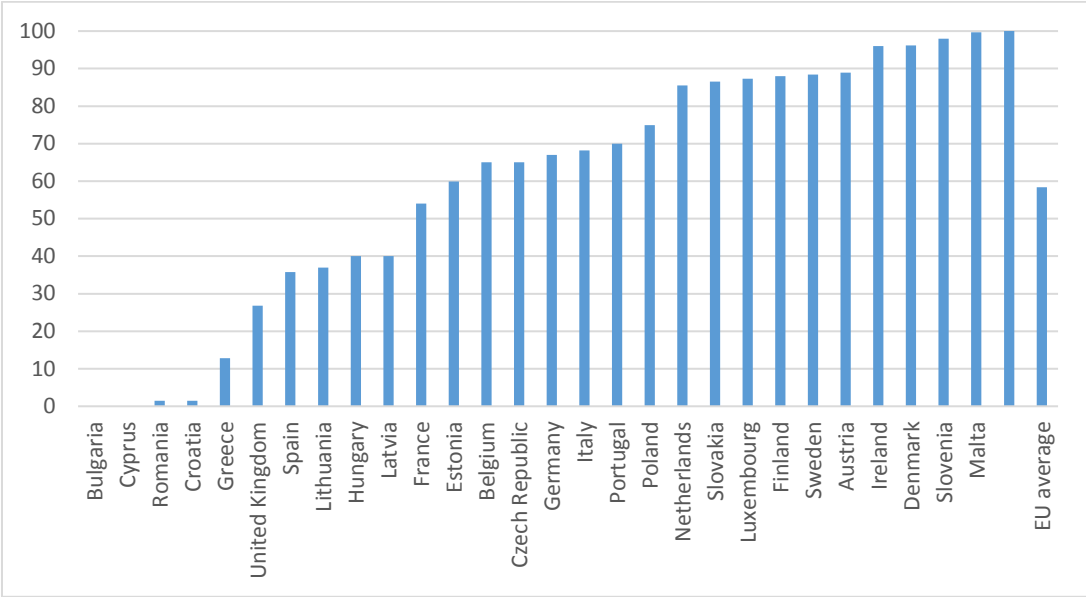
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1. Introduction

Dairy cooperatives have existed in Europe since the mid-19th century, when industrial processing of milk became attractive due to the invention of the cream separator (Bijman, 2018). Today, in the key milk-producing countries of the European Union (EU), cooperatives occupy dominant market positions (Bijman et al. 2012). Across the EU, cooperatives handle on average about 60% of the milk produced, although market shares differ substantially across Member States (Figure 1).

Figure 1. Share of cooperatives in handling milk within the EU (2015)



Source: Wijnands et al., 2017

In line with Hendrikse and Bijman (2002a), we define the cooperative as an organisational configuration consisting of two layers, with one layer made up of member farms and the other formed by the cooperative business. It has been claimed that the survival of the cooperative model requires alignment between the interests of the member farms and the cooperative business (Nilsson et al., 2012). However, due to changes in both markets and policies, this alignment has become increasingly difficult to achieve, which may particularly pose problems for large dairy cooperatives. Hind (1999) and Nilsson et al. (2009) have argued that when cooperatives become large food companies, competing with large non-cooperative food companies (e.g., Nestle or Danone), the interests of the members and those of the cooperative business drift apart, as the latter may feel the need to pursue growth strategies that members may not fully appreciate or regard as too risky.

In this report, we describe recent policy and market developments, arguing that they are fundamentally affecting the nature of traditional relationships between farmers and their dairy cooperatives. Moreover, we propose that these developments are impacting dairy farmers and cooperative business in ways that are increasingly undermining the smooth alignment of interests. Our key questions are concerned with the implications of such interest differentiation for the sustainability of the dairy cooperative model.

Dunn (1988) provides a good starting point for analysing the member–business relationship. Members have a threefold relationship with their cooperative: transaction, control, and finance. The transaction

relationship is at the core, as farmers expect to benefit from cooperative membership through supplying milk to the cooperative business. Meanwhile, the control and finance relationships are needed to let the cooperative business operate effectively and efficiently. Members democratically decide on the strategies and policies of the cooperatives business and provide the (equity) capital for the cooperative business to operate in their interest.

In the following two sections, we discuss recent changes in public policies (section 2) and dairy-market conditions (section 3). In both sections, we explore the implications of these changes at the level of the member farms and the level of cooperative business, taken as separate entities. In section 4, we discuss the issue of interest alignment between members and their cooperative firm and draw conclusions on what a growing divergence of interests may imply for the future of European dairy cooperatives.

Our assessment of the impacts of changing market and policy conditions on European dairy cooperatives is mainly based on developments in Germany and the Netherlands. While these two countries do not represent all of Europe, they do account for more than 30% of all EU milk deliveries. Moreover, these two countries can be considered front-runners in a number of important institutional and structural developments that can be seen or will soon be seen in other EU Members States. For instance, current EU policy on producer organisations is strongly influenced by the German experience with *Erzeugergemeinschaften* (producer associations). The Netherlands, with its highly concentrated and high-intensity dairy farming, large share of cooperatives in milk handling, environmental problems and demanding urban consumers, has often been a testing ground for new economic, political and technological developments that later effect dairy farming and cooperatives in other parts of Europe.

2. Changing policy environment

We have identified four major changes in the national and European policy environment that are likely to have important implications for the future of dairy cooperatives, particularly in terms of the relationship between members and cooperative businesses. A major first change in dairy policy took place in 2015, when production quotas for milk were abolished. This change has had a major impact on dairy farmers, cooperatives and markets, and it is perhaps the first clear example of a separating of interests between farmers and cooperative businesses. The second change is the increased attention of competition authorities on competition within the dairy value chain and, particularly, on the role of cooperatives. The third policy change concerns increasingly strict environmental regulations. Meanwhile, the fourth change has been the rise of EU policies for promoting the introduction of transparent contracting and the establishment of producer organisations.

2.1 Abolition of the milk quota system

European dairy markets have been regulated by the Common Agricultural Policy (CAP) of the EU for more than half a century. Since the 1960s, the CAP fostered production and included a minimum price guarantee, which was maintained by market protection and intervention purchases. This system managed to support prices at a level that comfortably covered costs – the optimal environment for stimulating investment in productivity enhancement. As a means to further stabilise prices, while also

seeking to reduce unlimited production expansion, the EU introduced a quota system for milk production in 1984, which was abolished in April 2015. This recent policy change led to intense discussion within cooperatives about whether cooperatives themselves should introduce a private quota system in order to try to maintain a minimum price. Most cooperatives decided against a private quota system, allowing members to increase milk production. Two effects of this policy change have, however, threatened interest alignment within cooperative firms.

At the *member-farm* level, the abolition of the EU milk quota system opened up new entrepreneurial options for farm growth. At times when milk prices were relatively high, such as in the years 2011–2014 (see page 12, Figure 2), many farmers invested in the expansion of their milk production. However, when prices steeply declined in 2015 and 2016, the same farmers were not ready to accept the low prices offered to them by their cooperatives.

At the level of the *cooperative business*, particularly in Northwestern Europe, the quota abolition has challenged both capacity and sales management. Between August 2014 and August 2015, milk production in Ireland, Belgium and the Netherlands grew by 11%, 12% and 14%, respectively (EU Milk Market Observatory). At the same time, a Russian import embargo, a decline in Chinese demand and a 7% increase in world total milk production created a huge surplus of milk on the European and global markets. Dairy cooperatives across Europe struggled with their obligations to process milk deliveries. FrieslandCampina, the largest dairy cooperative in Europe, temporarily introduced a bonus payment for *not* delivering milk, as it did not have the processing capacity for all the milk that members were expected to deliver.¹ DMK, the largest German dairy cooperative, reduced the prices it paid for member deliveries up to a point where members demonstrated and blocked the firm gates of their own cooperative in February of 2016.² Furthermore, historically low price levels in spring 2016 resulted in even larger numbers of dissatisfied members.

The abolition of the quota system has directly influenced the transaction relationship between farmers and cooperative processors. The quota abolition has made farmers more aware of market risks, even when selling to a cooperative, while at the same time it has led, on the side of cooperative management, to greater awareness of the need to properly manage deliveries.

2.2 Competition authorities scrutinize cooperatives

Over the past decade, in response to increasingly volatile food prices and, particularly, to concerns at the national and EU levels regarding the proper working of food markets, European and national competition authorities have broadened and intensified their monitoring and investigation of agriculture and food industries (ECN, 2012). Due to their competition-enhancing effect, agricultural cooperatives have traditionally enjoyed exemptions from competition regulations. Recently, however, in the wake of market liberalisation, national and European competition authorities have become more critical of cooperative market positions. In particular, when cooperatives combine high market shares with tight vertical coordination in the food chain, competition authorities have articulated concerns (Sheldon, 2017). For example, the German competition authority – the *Bundeskartellamt* –

¹ FrieslandCampina press release of 9 March 2017: “Deduction and premium temporary standstill measure”.

² *Agrarheute*, issue of 23 February 2016: <<https://www.agrarheute.com/land-leben/bauern-blockieren-dmk-molkerei-521003>>.

recently renewed its concern that multiyear delivery contracts between farmers and their cooperatives would reduce the options for farmers to flexibly switch between buyers, for new processors to enter the market and for incumbent processors to expand capacity (Bundeskartellamt 2017).³

Two effects of this reconsideration of cooperative market positions threaten interest alignment within cooperative firms.

At the *member-farm* level, the traditionally tight relationship between farmers and their cooperatives are being put into question. Competition agencies are demanding that farmers can follow price signals and market opportunities by easily switching to other buyers (if available). The Bundeskartellamt is arguing that the increasing number of dairy producers switching from cooperative delivery to other market channels would be a sign of improved competitiveness in the dairy chain. This development is likely to have a lasting impact on the control relationship between farmers and cooperative management, because it is partly transferring the responsibility of controlling management away from cooperative boards (internal governance) to the market (market governance).

At the level of the *cooperative business*, these policy changes are increasing uncertainty as to what volumes will be delivered to its processing plants. At the same time, another effect has to do with governance, as flexible membership and delivery arrangements make it more difficult to capitalise and finance cooperatives. Meanwhile, and in line with the argument developed above, cooperative management is being freed from a considerable amount of internal control, because unsatisfied members may simply exit the cooperative instead of voicing their complaints at member meetings. One possible effect of this development is that cooperative management will regain control over capacity by offering most preferential conditions to the members they consider optimal in terms of cost of milk collection and quality. This screening for optimal producers implies a likely decrease in the importance of traditional cooperative values, such as equal treatment of members and democratic decision making.

With more a volatile membership, cooperative investments may become more conservative and less risky, with implications for innovation and product development. Another effect may be that cooperative processors will introduce fixed-volume contracts, in order to better plan processing capacity. More generally, the relationship between members and cooperatives will likely see an increase in individual contracting.

2.3 Stricter environmental policies

At the national and EU levels, policy makers have drafted (or are working towards) regulations to reduce the environmental impacts of milk production, particularly in highly intensive production regions like the Netherlands. Primary production accounts for by far the largest share of environmental impacts derived from the dairy sector (Gerber et al., 2011). Greenhouse gas emissions (particularly methane) and high levels of nitrate and phosphate in soils and water are the main

³ In determining milk prices, dairy cooperatives work with a monthly adjusted guaranteed minimum price and an end-of-year bonus payment.

environmental problems here. Given increasing concern about climate change, we expect that environmental standards will impose further restrictions on high-intensity dairy farming.

At the *member-farm* level, setting targets for the reduction of greenhouse gas emissions might affect the allowable number of dairy cows per farm. This may limit further expansion of milk production and favour yield increases at the expense of herd numbers. Overall, it is expected that production costs will increase, as stricter sustainability standards require additional investments, such as in manure processing systems (e.g. into dry matter or biogas), fewer cows per hectare, and more expensive housing systems. However, higher production costs are not likely to affect all farmers equally, as low-intensity farming systems have more options for reducing environmental impacts. Whether “more sustainable” farmers will actually receive a price premium as compensation depends on society’s willingness to pay for reduced environmental impacts – a willingness that, in our opinion, currently does not seem to very high. Requirements that apply to the dairy sector as a whole (i.e., public or semi-public standards) will not likely generate a higher price, whereas private standards introduced by cooperative themselves may generate (temporary) marketing advantages.

In general, farmers already specialized in niche products (organic, regional, mountain, coastal) and those with the aim to expand production may be the first to internalize environmental requirements and then lobby their cooperatives to reimburse part of their investment cost at the expense of those with a shorter time horizon or part-time orientation. Sustainability policies may, thus, increase heterogeneity problems and differentiation among members.

At the level of the *cooperative business*, stricter environmental policies will lead to the implementation of more detailed procedures for monitoring and controlling member sustainability practises. Improved cooperative sustainability control and support systems are likely to consist of (a) additional information exchange and technical assistance; (b) the introduction of sanctions in cases of non-compliance; and (c) price premiums for applying special production methods.⁴ Particularly the strict monitoring aspects of such updated systems may not always be appreciated by members who consider this as a constraint on their entrepreneurial freedom.

In addition, cooperatives may themselves develop labelling and branding strategies that can lead to differentiation among member groups from different regions, with different farming systems, working with different cow breeds, and/or producing different types of milk. Such differentiation within the transaction relationships between members and cooperative businesses would lead to further heterogeneity among members or member groups. Yet, such heterogeneity has been claimed to be detrimental for cooperatives, as it hampers efficient decision-making and leads to a loss of member commitment (Höhler and Kühl, 2017).

⁴ For instance, farmers in the Netherlands receive a milk-price premium (of 1.5 to 2 cents/kg) if they let their cows walk in meadows for at least 720 hours per year and at least 120 days a year.

2.4 EU promotion of producer organisations and transparent contracting

In 2013, the European Commission introduced new legislation to encourage dairy farmers to establish producer organisations (POs).⁵ The so-called Milk Package was devised to guide development of the dairy sector after the end of the quota system in 2015, with the goals of strengthening the position of milk producers in the dairy supply chain and preparing the dairy sector for a more market-oriented future (i.e., an EU market without production quotas). Under this legislation, Member States have the option to make written contracts between milk producers and processors compulsory, whereas farmers have the possibility to negotiate contract terms, including prices and delivery conditions, collectively via recognized POs. One of the key advantages of a recognized PO is that it can negotiate prices on behalf of its members without having formal ownership of the product (under competition rules, this is not allowed for other organisations either). Farmers are particularly encouraged to set up such bargaining POs in situations where they sell to a non-cooperative milk processor. As existing cooperatives are assumed to work in the interest of their members, farmers that are members of a cooperative have no reason to establish a PO. There are restrictions on the maximum volume of milk that individual POs can negotiate; they are limited to 3.5% of total EU production and 33% of the national production of the Member State involved.⁶ Individual POs can become members of an Association of Producer Organisations (APO).

As of December 2015, the EU had 260 registered dairy POs and APOs (European Commission, 2016), with three countries representing 92% of all POs: 148 in Germany, 51 in France and 41 in Italy. In terms of the volume of milk negotiated by POs, Germany has been by far the largest, as more than 40% of all milk deliveries in Germany were traded through them in 2015, with the largest APO in Germany negotiating delivery contracts on behalf of 114 POs, amounting to 4.6 billion kg of raw milk (Bayern MEG, 2017). The annual marketable production of the 260 POs recognised for dairy was approximately 13% of total EU milk deliveries in 2015 and 37% of total EU milk deliveries outside of the cooperative circuits (European Commission, 2016).

Meanwhile, other Member States with strong cooperative sectors in dairy generally do not encourage the establishment of POs. Consequently, there are no dairy POs in Denmark, Finland, the Netherlands, Sweden, Austria, Ireland, Slovenia and Poland (European Commission, 2016), even though it is not forbidden for farmers in these countries to set them up. The situation in Germany is different, however. Although more than 65% of the country's raw milk is handled by cooperatives⁷, it also has a long tradition of POs (formerly *Erzeugergemeinschaft*, now *ErzeugerOrganisation*).

At first sight, the EU policy of promoting POs may not seem to have any effects at *member-farm* level. However, as it provides an alternative for farmers that are dissatisfied with their current cooperative, it can reduce the barriers to exiting cooperative membership. We expect that particularly those

⁵ In this report we refer to POs that are set up to jointly sell the products of their members. The EU legislation also allows POs that have been set up to provide services to their members or to agree on industry-wide rules on quality, animal health or joint research. Sometimes this distinction is referred to as economic versus non-economic POs.

⁶ Details regarding the Milk Package, as well as assessments of the extent of its implementation, can be found at <https://ec.europa.eu/agriculture/milk/milk-package_en>.

⁷ POs also sell to processing cooperatives, which explains the 40% market share of POs and the 65% market share of cooperatives as being due to some overlap.

farmers who are dissatisfied with prices paid by their cooperative, have a shorter time horizon than the cooperative business has, and perceive that the cooperative is no longer working in the interest of its members will exit the cooperative and join a PO. The shift from cooperatives to POs may sharpen the differences among groups of farmers (and reduce sector-wide or regional solidarity), as new POs will be more selective in accepting members than current cooperatives. For instance, large farms are likely to team up with other large farms, as this would provide advantages in their new bargaining situation. Small farms, on the other hand, are less likely to set up strong bargaining POs.

At the level of the *cooperative business*, the effect of the EU policy to promote POs may be that some farmers – most likely large producers – can more easily leave their cooperative, with such cooperatives then facing higher uncertainty regarding long-term milk supply. To maintain efficiency in processing and fulfil contracts with downstream buyers, cooperatives may consequently have to negotiate with a larger number of supplier groups.

A more speculative scenario is the following. Instead of leaving their cooperative, dissatisfied members may instead set up bargaining groups within it. Although these ‘internal POs’ will not be endorsed by national authorities, they may still be successful in bargaining better delivery conditions compared to other members. If these groups are successful, a snowball effect could then occur, as other farmers also form groups and negotiate with the management of the cooperative business. In the end, the entire membership will probably be divided into several product-based, region-based or farm-size-based bargaining groups, leading to higher internal transaction costs for the cooperative business.⁸

The potential break-up of the membership into separate bargaining groups may lead to financial problems for the cooperative business, as solidarity and commitment are likely to decrease. Members may, for example, no longer be willing to finance the risk of investment in processing capacity and building market position, if they feel that most of the benefits will go to other members or even to non-member groups.⁹ Furthermore, even though dissatisfied members are already likely to lack incentives to finance their cooperative, current intra-cooperative pricing policies does not allow them to opt out of co-financing. However, once farmers have set up bargaining groups, they will start negotiating for different ways of distributing contractual and residual income.

Fostering the development of new POs obviously affects all three elements of the relationship between members and their cooperatives. Farmers leaving their cooperative solely to create brokerage contracts with new POs will clearly give up their control and finance relationships with it. However, concentration along the value chain may not offer additional processing alternatives within a region. Thus, farmers may end up with a re-negotiated transaction relationship (and delivery contract) with a processor they once owned and controlled as members.

⁸ Such a process of forming bargaining groups within cooperatives took place in Dutch fresh-produce cooperatives in the late 1990s and early 2000s, when growers of different vegetables set up grower associations and started bargaining for favourable prices for their products (Hendrikse and Bijman, 2002b). The availability of EU subsidies for producer organisations encouraged growers to set up separate organisations. However, the dairy situation is different, to the extent that there are no subsidies allotted for POs.

⁹ This is the problem of vaguely-defined property rights (Cook, 1995): because members have no full control over or do not receive full benefits of the investments in jointly-owned assets, they have a weak incentive to make those investments.

Having said all of this, we want to emphasize that the scenario described above cannot be directly blamed on the introduction of EU policies to promote POs and transparent contracts. The process of differentiation among farmer groups has already been taking place, due to increasing heterogeneity among farmers (e.g., in farm size) and to increasing differentiation in product markets. The main effect of the EU policies appears to be that they will spur more rapid development and institutionalization of these differentiation processes.

3. Changing market environment

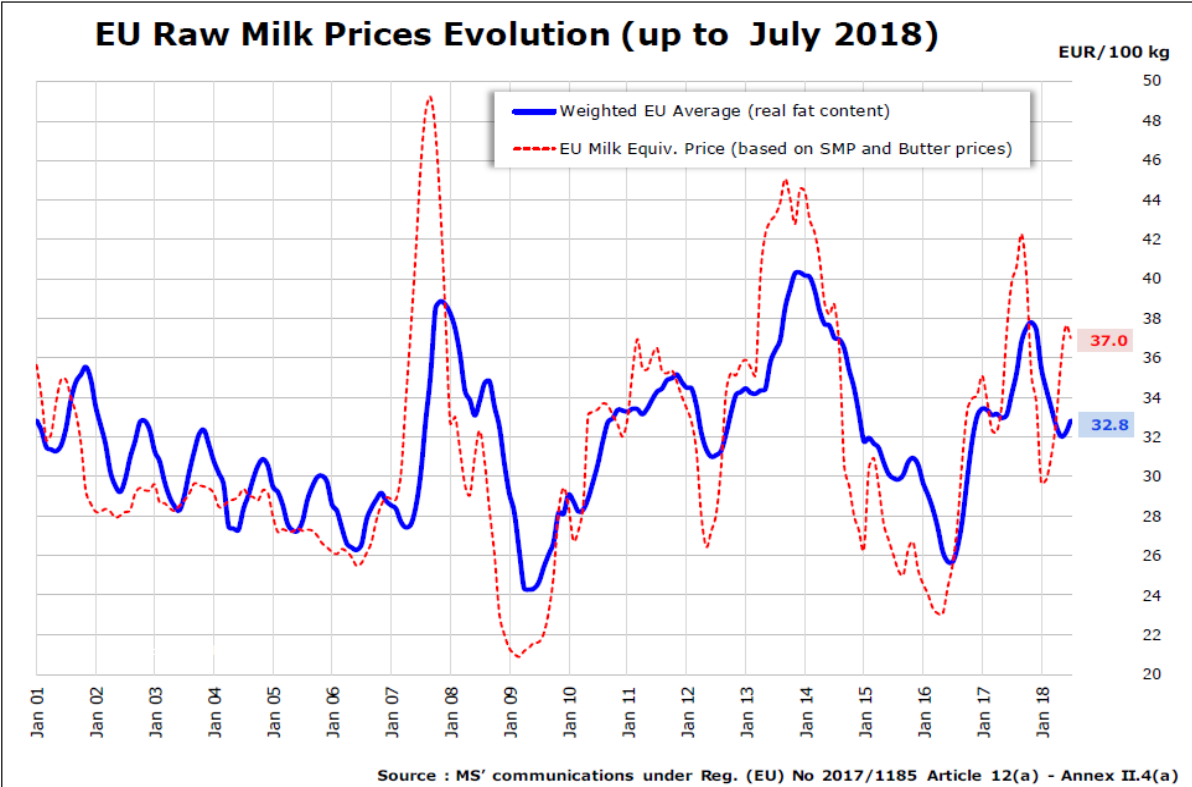
In addition to policy changes, dairy farmers and dairy cooperatives have experienced a number of major changes in market environment over the past decade, and most of these changes will not simply pass by but, rather, continue to affect the dairy industry in the near future. We have identified three major changes in market conditions – increasing volatility in dairy markets, changing consumer preferences, and ongoing concentration in dairy value chains – each of which is discussed in the following subsections.

3.1 Increasing volatility in dairy markets

Since 2007, well ahead of the abolition of the milk quota system in April 2015, prices for raw milk and especially for dairy products have become more volatile (Figure 2). The decrease in intervention-based prices that were part of the 2003 CAP reform contributed towards bringing European and world dairy-product prices closer to each other. In addition, as European dairy companies have increased their exports to Asian markets, their revenues have become more dependent on global demand. Because of greater volatility in EU and global markets that has resulted from this process, farmers are facing higher price risks. The increase in the volatility of dairy markets (Müller et al., 2018) may lead to mismatch between member interests and cooperative business interests.

At the *member-farm* level, farmers are price takers, and they cannot pass on input-price increases. As such, in a liberalised market environment, farmers are exposed to both input- and output-price risks. Quota abolition has increased farm growth and investments in herd size. Coming out of a long period of price stabilisation policies, members would tend to expect their cooperative to dampen price fluctuation to protect their investments in productivity enhancement. However, high price volatility now endangers such investments, because it generally leads to reassessment of financial planning and investment decisions from the past. During the recent milk-price crisis of 2014–2015, larger and more specialized dairy farms were hit the hardest. In the future, along the given trajectory, more risk-averse farmers may decide against making investments in production and productivity growth (Rommel et al., 2017). Excessive price fluctuation may also lead to an increasing number of farmers to phase out dairy production altogether, leaving fewer member-farms to invest in the cooperative business.

Figure 2. Development of EU raw milk prices, 2001-2018.



Source: EUROPEAN COMMISSION, 2018.

At the *cooperative business* level, such higher price volatility can have various effects. First, more volatile markets endanger long-term investments at the level of the cooperative business. As said above, member willingness to invest in their cooperative will be reduced, as the relationship between costs and benefits becomes more uncertain. Second, high price volatility tends to raise discussions regarding whether the cooperative should protect their members from price risks and, if so, what kinds of alternative forward-contracting or hedging schemes¹⁰ could be offered or facilitated by the cooperative. Interestingly, hedging schemes tie farmers closer to a particular processor, at least for the duration of the hedging contract, thereby reducing the processor’s risk of losing supply.

Thus, increasing volatility may induce tighter vertical integration, accompanied by more rapid structural change. Because volatility endangers the long-term sunk investments into farm growth made in the past, strategies for cooperatives to help “optimal producers” may also threaten cooperative viability in the medium term.

¹⁰ Hedging is defined as making an investment to reduce the risk of adverse price movements. In practical terms, it involves dairy farmers fixing the price of their milk for a defined period of time in order to provide milk-price stability. But such price stability comes at a cost, in the form a premium paid by farmers.

3.2 Changing consumer preferences

Consumers are increasingly valuing credence- and experience-related quality attributes of dairy product, such as regional origin, organic and fair production methods, animal-welfare sensitivity, and environmental friendliness. Saitone and Sexton (2017) have summarized this trend as “consumers’ diverse demands for quality, identity and morality”. Such consumer preferences are translated by retail companies – who are often pressured by NGOs – into specific quality and sustainability requirements, which then present threats and opportunities that may work out differently for farmers and cooperative businesses and, consequently, affect their relationship.

Most of the quality and sustainability features of dairy products today are so-called credence attributes, which are associated with establishing some sort of trusting relationship between buyer and seller. They require more tight vertical relationships between farmers and processors, both because farmers want to reduce transaction costs related to investment in specific human and physical assets and because processors want to have guarantees about product attributes and production methods. With credence attributes, the risk of brand devaluation is high but can be reduced by introducing detailed contracts and costly monitoring schemes (Hueth et al. 1999).

At the *member-farm* level, the impact of changing consumer preferences can be summarized in the need for greater investments and, thus, higher production costs, increasingly detailed monitoring and information sharing regarding sustainability requirements, and reduction of farmers’ operational freedom. At the same time, new opportunities have arisen for developing and selling specialty products. For instance, a growth in consumer preference for local products could imply more diverse sales options for (entrepreneurial) farmers. With the aid of modern information technology, the cost of differentiated logistics may be reduced (Trienekens et al., 2012), enabling the development of local food chains with small numbers of producers directly linked to specific consumer groups (Renting et al., 2003; Mundler and Rumpus, 2012). In addition, the introduction of small-scale processing units can allow farmers to explore on-farm processing and selling in short supply chains.¹¹

At the *cooperative business* level, consumer preferences for credence attributes may lead to investment in tighter relationships with members in terms of, for instance, more detailed monitoring systems. When the quality and sustainability preferences of consumers lead to more product differentiation at the farm level, this may strengthen the trend towards separate member groups, each focussing on the production of specialty milk. More product differentiation at the farm level will lead to a need for different logistical systems. In general, it is expected that the dairy sector will see more differentiated milk flows, due to changes in consumer demand and facilitated by advances in logistics and information technology.

Local and short food supply chains as well as higher differentiation in milk flows will raise organisational issues for cooperatives. First, increasingly diverse product streams may be more difficult to organize within a business that has been operating on the basis of large quantities of commodity-type products. Second, rewarding farmers for specialty milk will likely invite discussions among

¹¹ For instance, in August 2018, milking robot manufacturer Lely introduced a milk processing unit that can be installed on individual farms to directly process raw milk into final dairy products. See: <https://www.lely.com/orbiter>.

members about appropriate allocation schemes for additional value created as well as for additional risks taken. Cross-subsidization among different activities and, thus, different member groups is also likely to be present. Although cross-subsidization already exists in some form within any cooperative, as part of solidarity among the membership, members may become more critical once milk streams become more differentiated.

In sum, changing consumer preferences are likely to provide both opportunities and challenges for farmers as well as cooperative businesses, although the impacts of this process on their degrees of interest alignment is ambiguous. Differentiated products entail both market opportunities and organisational challenges. If cooperative are able to design transparent and fair contracts with different member groups (producing different specialties), then it is likely that increasing membership heterogeneity can be efficiently dealt with, and the interests of members and those of the cooperative business can be satisfactorily aligned. A promising example of such practice is presented by the cooperative Berchtesgadener Land in Bavaria, where different types of milk and different types of payment schemes coexist within the same cooperative.¹²

3.3 Increasing concentration in the dairy value chain

Understanding the relationships between farmers and cooperatives requires an understanding of the whole value chain, including market structures and company strategies at the level of food retailing (Sexton, 2013; Sheldon, 2017; Bonanno et al., 2017). In other words, the structure of the market for raw milk cannot be assessed in isolation from the structure of the market for processed dairy products overall, as company strategies for input and output markets are intricately connected.

Traditionally, dairy cooperatives were a response to the problem of how to market perishable products under fair trading conditions, in situations of asymmetric information and geographical asset specificity (Bonus, 1986). In each village with milk production, dairy farmers set up a processing cooperative, at a low distance from their farms. As the most efficient scale of milk processing increased over time, local cooperatives merged into regional cooperatives. When scale economies became more determined by marketing than production costs, and concentration in retail required development of countervailing power among suppliers, regional cooperatives merged into national or even international cooperatives (Hanisch et al., 2012; Bijman, 2018).

Although Europe still has thousands of dairy processors, the largest share of milk processing and marketing is done by a small number of large companies (Hanisch et al., 2012). For example, in 2012 the market share of the five largest processors of milk in the EU-15 was 56%. Similar ratios apply to Germany, the EU's largest dairy producer. In 2011, 89,000 German farmers delivered around 97% of raw milk to about 126 dairies, among which 70% went to dairies that processed more than 300,000 tons of milk. Meanwhile, the share of total raw milk processed by the five largest German dairies increased from 34% in 2012 to 50% in 2016 (Grau and Hockmann, 2018).

Though the dairy value chain can clearly be said to be characterized by oligopolistic structures, little evidence for oligopsonists using their power to the disadvantage of dairy farmers has been found.

¹² <https://bergbauernmilch.de/>

To the contrary, the combination of a highly concentrated retail market and an increasingly concentrated dairy processing industry may be favourable for the bargaining position of farmers. As Saitone and Sexton (2017: 647) have argued, “[v]ertical coordination, contract production, and ‘lock in’ between farmers and downstream marketers are inevitable consequences of a highly capital-intensive food-marketing infrastructure that is producing differentiated finished products that require specific amounts of farm products with precise characteristics to operate plants efficiently (meaning buyer demand in the short run is highly inelastic).” The supply and delivery vulnerability of an increasingly complex dairy industry would suggest that, having few selling options, a symbiotic relationship between dairy farmers and processors will emerge, allowing farmers to earn at least a competitive rate of return on their investments (Sexton 2013).

Food retail markets in Europe are very concentrated. In most EU Member States, the CR5 concentration ratio¹³ is above 60% (OECD, 2014). As most supermarket companies purchase through buyer groups, their bargaining power is even higher than their individual market share would suggest. Although concentration ratios are not necessarily an indication of market power, they do suggest that dairy cooperatives have limited sales options, and losing a major retailer as a customer is likely to have a large impact on the economic performance of a dairy cooperative. In addition to market-structure impacts, several trends are now affecting the bargaining power of dairy cooperatives in the value chain:

- A large share of dairy products is sold under private label.
- Some retailers use fresh milk to attract additional customers, by selling it at or below cost price.
- Retailers in the USA have set up their own milk-processing plants and started to purchase raw milk directly from a group of large farmers, bypassing dairy cooperatives.¹⁴ Retailers in Europe may also consider this strategy.

The trend towards concentration in retail has triggered a responding concentration trend in milk processing. To keep up with bargaining power at the retail level, large and modern cooperative companies have attained positions among the top of the world’s food processing companies. Table 1 shows the 20 largest dairy companies of the world, seven of which are cooperatives: Dairy Farmers of America; FrieslandCampina; Fonterra; Arla Foods; DMK; Sodiaal; Agropur. Table 1 also shows the added value per kg of milk intake. As expected, cooperatives have a lower average added value per kg, although variations among cooperatives are quite large. The numbers in the table should be interpreted with care, however, as two different sources are used and several figures are estimates.

For almost a century, mergers between cooperatives were justified by advances in technology, allowing for efficiency gains by further horizontal integration. However, since the 1980s, particularly after the implementation of the EU milk-quota system in 1984, mergers have been supported by arguments about strengthening their bargaining position vis-a-vis retailers (Bijman, 2018). Many dairy cooperatives have become large food companies that operate in a very competitive market environment with strong retail companies and large non-cooperative competitors. These cooperative businesses have interests and dynamics that are not necessarily aligned with the interests and dynamics of dairy farmers, however. Thus, when dairy farmers experience a price crisis, the

¹³ The CR5 concentration ratio shows the joint market share of the 5 largest companies in a sector.

¹⁴ <https://www.thedailymeal.com/walmart-milk-processing-plant-dean-foods-dairy-farmers/42418>

cooperative business may not be able to accommodate them, which is likely to have consequences for member commitment and participation.

Table 1. Global Top 20 Dairy Cooperatives (2017)

Ranking	Company name	Country	Legal form	Turnover dairy products (in billion euros)*	Milk intake (in billion kg)**	Added value (in euro/kg milk intake)
1	Nestlé	CH	private	21.4	13.7	1.56
3	Lactalis	FR	private	17.7	19.6	0.90
2	Danone	FR	private	12.3	8.6	1.43
4	Dairy Farmers of America	USA	cooperative	13.0	29.2	0.45
5	Fonterra	NZ	cooperative	12.1	23.7	0.51
6	FrieslandCampina	NL	cooperative	12.0	13.6	0.88
7	Arla Foods	DK/SE	cooperative	10.3	13.9	0.74
8	Saputo	Canada	private	9.6	9.8	0.98
9	Yili	China	private	8.8	7.2	1.22
10	Mengniu	China	private	7.8	6.4	1.22
11	Dean Foods	USA	private	6.7	9.4	0.71
12	Unilever	NL	private	6.2	n.a.	n.a.
13	DMK	DE	cooperative	5.8	8.1	0.72
14	Kraft Heinz	USA	private	5.5	n.a.	n.a.
15	Meiji	Japan	private	5.1	n.a.	n.a.
16	Sodiaal	FR	cooperative	5.1	4.9	1.04
17	Savencia	FR	private	4.9	4.1	1.20
18	Müller	DE	private	4.5	4.6	0.98
19	Agropur	Canada	cooperative	4.5	6.3	0.71
20	Schreiber Foods	USA	private	4.4	4.5	0.98
* Source: Rabobank Global Dairy Top 20, 2018						
**source: IFCN Top 20 Milk Processors List 2018						

One of key elements of the competition between cooperatives and retailers and between cooperative and non-cooperative processors is who has control over the sustainability agenda. Retailers are pushing processors to supply more sustainable products. Due to the diversity in their membership, however, cooperatives may have a hard time convincing all members to produce in a more sustainable way, particularly if it implies higher costs that are not (or not directly) compensated through higher prices. As non-cooperative processors can be more selective in choosing their suppliers, cooperatives may thus end up with a competitive disadvantage.

At the *member-farm* level, ongoing concentration along the value chain implies that farmers will have even less choice in choosing buyers. In situations where farmers have only one feasible buyer, the buyer could exploit the asymmetric bargaining situation. Being member of a cooperative should prevent such exploitation, however, as the cooperative is owned by the farmers. However, if farmers *de facto* give up their control relationship and consider their cooperative business to be just like any other buyer, they will end up hampering how the cooperative itself can invest in member relationships, thus weakening their overall bargaining position.

However, findings from industrial organisation theory suggest that product differentiation, global competition and increased concern for environmental impacts can lead to tighter collaboration between farmers and milk processors, including cooperatives. These findings would counter the above-mentioned claims of competition-promoting agencies about a need to increase the competitiveness of the agricultural value chain via flexible contract relations between cooperative members and cooperative dairies.

At the level of the *cooperative business*, agricultural economists have long tried to measure potentially exploitative behaviours in agricultural value chains among dominant oligopsonistic processors. However, in reviewing the relevant literature on market power in agriculture, Sexton (2013) concludes that evidence on exploitative behaviour is missing. From our perspective, one of the explanations for this, at first glance surprising, finding is that changing policy and market environments have left increasingly complex processing companies vulnerable to market risk, quality and capacity management problems. In this situation it is the competition for the “best producers” and the necessity to bind them long term to the company that keeps the processor “honest”.

In sum, ongoing concentration in dairy value chains has led to oligopsonistic market structures. Although there is no evidence that farmers are being exploited by large processors therein, particularly as vertical coordination in dairy value chains leads to tighter relationships between milk producers and milk processors, the control relationship between members and cooperative businesses is changing. Although membership continues to be important for bargaining reasons, control over increasingly large and diversified cooperative businesses has become increasingly difficult.

4. Conclusions

We began this report by surveying the most important trends in policies and markets that are likely to affect dairy cooperatives in the EU, more specifically focusing on the ones that could affect relationships between members and cooperative businesses. We have been led to assume that these trends in policies and markets are having a differential effect on interest alignment between farmers and cooperative business, thus challenging the future of the cooperative as an economic organisational form in the European dairy industry.

We have sought to show that, for European dairy farmers and dairy cooperatives, the policy and market environment has changed dramatically over the past decade. With the reduction of market protection and the abolition of the milk quotas, European dairy farmers and their cooperatives have experienced much larger price volatility than in the past. At the same time, large cooperatives have become subject of greater attention from competition authorities, and EU as well as national competition agencies have been scrutinising the role of cooperatives in modern agricultural markets. Meanwhile, new producer organisations are currently being promoted by the EU intended to give farmers an organisational tool to strengthen their market position in dairy chains. In addition, environmental regulations are becoming stricter, in the light of climate change and the implementation of transformative measures towards more sustainable agricultural practices.

At the market level, the competitive environment in the dairy sector is characterized by oligopsonistic structures in highly concentrated markets, increasing integration of global dairy markets, and high volatility of milk prices. In addition, consumer preferences and advances in technology have opened the door for more differentiation in dairy markets, not only at the traditional level of the processing company but also at the farmer level. Given the increasing importance of credence-related attributes for dairy products, such as being organic or gen-tech free, there is likely to be increasingly tight vertical coordination between farmers and cooperative processors. Although dairy farming in Europe can no longer be characterized as a low-risk business, there are new opportunities arising for entrepreneurial farmers, because consumers are now more highly valuing local and regional products as well as dairy products with special quality characteristics.

Changing market and policy environments have altered the relationship between farmers and their dairy cooperatives. In many ways, this situation is new, and we have asked ourselves to what extent such changes in markets and policies are affecting the specific alignment requirements between the interests of members and those of cooperative businesses? Both the emerging policy and market environments have been shaping differential responses in attitude from both the farmer and cooperative-business sides.¹⁵

From the perspective of the **farmer**, the impacts of the trends in markets and policies can be summarized as follows. First, farmers face higher production costs due to stricter environmental policies and changing consumer preferences, particularly for higher quality products and more animal- and environment-friendly production methods. Second, farmers are discovering new opportunities to produce specialty products, because consumers are asking for local specialties and for a larger variety of products. Third, farmers are facing an increasingly concentrated milk-processing industry, giving them fewer and fewer sales options. At the same time, and this is point four, farmers are becoming part of the process of increasingly tight vertical coordination in dairy chains. This implies that farmers and processors are working together closely to control quality, co-innovate in product development and exchange information on production and market conditions. Fifth, EU policies for promoting dairy POs have shown farmers that different models of collective action are available, so farmers are starting to experiment with new bargaining groups, both outside and within the cooperative.

In this context, one cost component for farmers that has been negligible in the past is now gaining importance: the cost of enterprise ownership. Whereas in the past a generous policy-created safety network isolated dairy farmers from many of the vagaries of a free market, this no longer holds. Consequently, being a cooperative member today implies full exposure to market forces, and each crisis is forcing farmers to reconsider the benefits of ownership of complex dairy enterprises.

From the perspective of the **cooperative manager**, the outlined developments in markets and policies can be summarized as follows. First, changes in the CAP have made the European dairy markets more volatile, thereby introducing greater uncertainty. Second, stricter environmental policies imply a need to exert more control over the farming activities of individual cooperative members, because adverse farmer behaviour may jeopardize the reputation (and the brand) of the entire cooperative. Third, changing consumer preferences are providing opportunities for innovation and product development.

¹⁵ Appendix A provides a summary table of the implications of the discussed developments in policies and markets for members and managers, listed separately.

Some of these innovations are only relevant at the level of processing companies, but others are the outcome of co-innovation in the value chain, where farmers and processors jointly develop new products. Such co-innovation will then lead to more differentiated milk streams. Fourth, the EU policies promoting producer organisations (POs) will lower the barrier for members to exit their cooperatives. Managers will experience farmers exploring new market opportunities by leaving the cooperative and bundling their delivery power horizontally in a PO, instead of integrating vertically within the processing cooperative. Fifth, the growth of dairy cooperatives into complex organisational structures has made managing these organisations more challenging, both on the business and member-relations sides.

Overall, we have observed contrasting developments in the dairy industry. Whereas cooperative businesses are looking for tighter relationships with farmers, to strengthen vertical coordination in the dairy chain, member-farmers may be becoming more sceptical of the benefits of membership in a processing cooperative. In other words, more vertical integration may end up coinciding with less horizontal integration. One result of this is that we expect to see more switching behaviour among cooperative members: towards another cooperative, a PO, or an investor-owned firm.

In cases where farmers remain cooperative members, they may still decide to set up separate groups within it and start bargaining with the management. This could be induced by dissatisfaction with current prices, but it could also be a result of new market opportunities attracting member attention. The overall result, however, is likely to be segmentation of the membership into different groups. Cooperative managers then have to enter into contract negotiations with each group individually, introducing differential delivery conditions among those groups. The impacts of such segmentation on the cooperative as a whole can be very diverse. On one hand, it is likely to raise transaction costs in the member–cooperative relationship. However, it may also enable the organizing of different milk streams, incentivising some farmers to invest in specific production methods or cow breeds. Strengthening vertical coordination between milk production and processing may be more easily managed through such member groups. At the same time, it could negatively affect solidarity among members and their willingness to invest in jointly owned assets. With more individualised or small group-based transaction relationships, the control and finance elements of the member–cooperative relationship are likely to become more difficult.

Trade-offs for dairy farmers, cooperative managers and policy makers

In the end, we expect the cooperative model to survive but also to develop in various directions, ranging from large cooperative milk processors with a strongly branded product position to many new producer organisations. We expect to see more switching behaviour among farmers, as well as the formation of small groups of farmers delivering specialty milk products. Some of these new groups will develop into recognized POs; others will become informal bargaining groups within their cooperative. The development of more separate farmer groups would not only imply a loss of horizontal integration (i.e., the traditional cooperative argument) but also a disconnection (or de-integration) of the bargaining and processing functions in the value chain.

What do these changes in the dairy cooperative landscape imply for dairy farmers, cooperative managers and policy makers? Below, we assess the likely impacts of the developments discussed in this report for each of these groups in turn.

Dairy farmers will have to carefully assess the trade-offs between the benefits and costs of tighter vertical collaboration within the dairy value chain, be that in the form of being member-owners of a processing cooperative or as individual contractors, most likely as members of bargaining POs. As member-owners, the trade-off is between the “cost of ownership”, that is, the cost of overseeing, co-financing and controlling a more and more complex cooperative dairy business, on the one hand, and the long-term guarantee of having a reliable market on the other hand. Whether membership also entails higher average milk prices depends very much on the strategy and competitive position of a cooperative. As contractors, the trade-off for farmers is between the benefits of having freedom of bargaining with any potential buyers, aiming thereby for the highest possible prices on the market, plus not having to bear the investment risks taken by cooperative processors against the risk of sometimes having difficulty finding a buyer and foregoing the benefits of a strong bargaining position in the market for final dairy products, product innovation and strong brands.

Directing and managing dairy cooperatives has become far more complex than in the past. Mergers, acquisitions, and the sheer size of modern dairy businesses have resulted in increasing heterogeneity among members. Managers of cooperatives must take into account that members may be too overburdened to shoulder the tasks of overseeing and controlling management. This requires new forms of member policies and – compared to the times of quotas and interventionism – more diversified and intense communication with members as a necessary means to keep them committed. In order to better reach single actor groups and allow them to play a role in the governance of the firm, changes within the cooperative governance system seem necessary. Whereas in the past professionalization of the board of directors was a key task of cooperative governance innovation, the near future may demand another type of innovation in internal governance, targeting the restructuring of representation across diversifying group interests and in accord with trends towards differentiation of products, regions and environmental services. A key factor in this process of binding members to the processing-cooperative business will include the ways in which the revitalisation of the role of owners or owner groups is carried out.

Finally, for policy makers, our analysis has emphasized the increasing complexity and organisational differentiation within the European dairy industry. Although the policy of promoting POs has enabled farmers to strengthen their bargaining power, we hold that the traditional model of the cooperative should not be abandoned. In an oligopsonistic dairy industry without cooperatives, where all processing and marketing would thus be done by investor-owned firms, farmers would forego the benefits of adding value at the processing stage as well as the benefits of the competitive yardstick (i.e., by their very presence, cooperatives induce competition for milk in the dairy industry, thus preventing exploitation of the weak bargaining power of the farmer). Finally, the main challenge for policy makers is to formulate policies that can support highly integrated value chains characterized by strong vertical coordination that would enable a combination of efficiency gains, healthy product innovation and long-term investments in sustainability.

The point of departure for this report was that changing policy and market environments affect farmers and managers in modern dairy value chains differently. Policy changes have been motivated by the need to strengthen the bargaining power of producers, the hope for tighter production volume coordination as well as by sustainability concerns. At the same time, we have seen that market liberalisation and international trends of concentration have been increasing market risks and competition at the level of producers and processors. Both trends underpin our concern about misalignment of key stakeholder interests in highly integrated dairy value chains dominated by cooperatives.

We propose that the future of modern dairy cooperatives will depend on both policy makers who can carefully assess the effects of short-term policy interventions against long-term dairy chain efficiency and competitiveness as well as on cooperative leaders who can continue innovating in ways that enable solutions for accommodating the interests of both different member groups and cooperative businesses themselves.

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Appendix A. Summary of policy and market developments related to European dairy cooperatives and their implications for members and managers

<i>Development</i>	<i>Implications for members</i>	<i>Implications for managers</i>
Changing Policy Environment		
Abolition of milk quota system	<ul style="list-style-type: none"> - greater opportunities for expanding milk production - higher price volatility 	<ul style="list-style-type: none"> - increased uncertainty about volume of deliveries
Stricter competition rules	<ul style="list-style-type: none"> - short-term contracts - more switching options - fixed-volume contracts 	<ul style="list-style-type: none"> - increased uncertainty about volume of deliveries beyond contracts - more conservative investment perspective among members - introduction of fixed-volume contracts - differential treatment of members (member groups)
Stricter environmental policies	<ul style="list-style-type: none"> - higher production costs - greater prescription of farming methods 	<ul style="list-style-type: none"> - stricter control of member production methods - technical support of members to comply with strict policies
EU promotion of POs	<ul style="list-style-type: none"> - reduced threshold for exiting cooperatives - small farms lose whereas large farms benefit from self-selection into new POs 	<ul style="list-style-type: none"> - more switching behaviour among members - more member groupings, all bargaining with the cooperative - more problems with financing the cooperative
Changing Market Environment		
Increasing volatility in markets	<ul style="list-style-type: none"> - reduced investments and innovation 	<ul style="list-style-type: none"> - reduced possibilities for obtaining equity capital from members - more discussion on whether cooperative should protect members from price risks - larger capital buffer needed
Changing consumer preferences	<ul style="list-style-type: none"> - more opportunities for specialty products - more local sales options - higher production costs - more prescription of farming methods - higher dependence on a particular processor - more (self)selection into member groups 	<ul style="list-style-type: none"> - more information exchange needed with members (e.g., prescription of production methods) - more differentiation among member groups - more differentiation of milk flows - more detailed contracting with members and member groups
Increasing concentration in milk processing and retail	<ul style="list-style-type: none"> - fewer choices in selling milk - higher incentives to join a PO - higher dependence on a particular processor 	<ul style="list-style-type: none"> - more complex companies to manage - greater scrutiny from competition authorities