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ORIGINAL ARTICLE

The commitment of farmers to traditional and hybrid cooperatives: Empirical evidence over a six-year period

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Abstract

This study investigates the commitment of farmer members to traditional and hybrid cooperatives, and examines how and why their commitment has changed over time. The empirical basis consists of three surveys of representative samples of Finnish farmers conducted in 2010, 2013 and 2016. Dairy cooperatives in Finland have a traditional organizational form. Animal breeders deliver to hybrid cooperatives that have some external investors, but farmers have the majority of the votes. In both industries, the farmers are committed to their cooperatives and increasingly so over the years. This is particularly true of dairy farmers. However, the members' commitment is based more on their satisfaction with the cooperatives' business activities rather than on any cohesion within the cooperative societies. One explanation for this is that primary agriculture is becoming more consolidated, with fewer but larger farms whose owners are business oriented and professional.

KEYWORDS

cooperative ideology, Finland, horizontal integration, membership motive, ordered probit, sample selection, vertical integration

JEL CLASSIFICATION
P130, Q130, O170

1 | INTRODUCTION

The traditional form of cooperative business has historically demonstrated its strength by supplying large volumes of standard products at low cost (Iliopoulos & Valentinov, 2018). However, intensified competition has led many cooperatives in Western economies to follow differentiated marketing strategies, which require significant financial resources, highly skilled leadership and quick decision-making, all of which are difficult to combine with the attributes of traditional cooperation (Kyriakopoulos et al., 2004). Therefore, in recent decades, many agricultural cooperatives that run along traditional lines have been converted into hybrid cooperatives (Bijman, 2010; Fulton & Giannakas, 2013; Kopka, 2023).

Cooperatives are sometimes said to have a hybrid business form because they operate like a business in the marketplace while also having a hierarchical coordination structure (Ménard, 2018). The concept of a "hybrid cooperative", however, means a cooperative that has substituted traditional attributes in terms of ownership and control with more or less individualised ownership and control (Kopka, 2023; Nilsson, 2018). They may provide residual rights that are not only linked to member patronage, but "cooperatives' business operations may be financed, in whole or in part, via debt or equity from both users and non-users of the cooperative" (Kopka, 2023, p. 103). The residual rights may be transferable, even at a market rate (Chaddad & Cook, 2004). Hybrid cooperatives may diverge from the principle of full member control, as external investors can have formal influence (Grashuis, 2018). The operations may take place within limited companies that the cooperative society owns with outside investors.

Despite these attributes, hybrid cooperatives can be said to comply with the general definition of cooperatives: "In a cooperative, the user is the focal point, with the direct status of user, owner, and control vested in the same individual" (Dunn, 1988, p. 85). This definition allows a variety of organisations, including hybrid cooperatives, to be called cooperatives (Hansmann, 1996). Farmers may also consider hybrid cooperatives to be cooperatives.

There is considerable variety among hybrid cooperatives because they may distribute property and decision rights to members and external actors in different ways (Chaddad & Cook, 2004; Grashuis & Cook, 2017). For example, in New Generation Cooperatives, the members have individual ownership of the cooperative (Franken & Grashuis, 2023). However, this study concerns the type of hybrid cooperatives where external investors are co-owners, but the farmers have a controlling right. This is because there are different types of stock and the farmers control most of the stock, which implies large voting powers. This type of cooperative is also known as a farmer-controlled business (Hess et al., 2013).

The fact that traditional and hybrid cooperatives have different attributes may have implications for a farmer's motivations for being a member of a cooperative (Hogeland, 2015). In a cooperative with external owners, the business operations have the goal of sharing capital returns between the external owners and the cooperative society. This is a restriction in comparison with the traditional goal of a cooperative of promoting member interests. This will influence the members' view of their cooperatives. However, in a study about farmers' attitudes to a firm that had converted from a cooperative into an investor-owned firm, the authors found that many farmers were not aware of the change in organizational form (Nilsson et al., 2014). In addition, other major organizational changes may occur without the members noticing them (Nilsson et al., 2009). Members'

perceptions may also differ over time as both traditional and hybrid cooperatives gradually change their attributes when adapting to market changes.

A large number of empirical studies have explored farmers' commitment to their cooperatives (Barraud-Didier et al., 2012; Feng et al., 2016; Grashuis & Su, 2019; James & Sykuta, 2006; Nilsson et al., 2014). However, no study has specified to what extent and how the investigated cooperatives are traditional or hybrids of any kind. It is likely that the researchers assume that the investigated cooperatives are traditional.

In general, previous studies have concerned social and socio-psychological variables, such as trust, satisfaction, loyalty, commitment, knowledge and social coherence (Apparao et al., 2019; Bhuyan, 2007; Borgen, 2001; Hansen et al., 2002; Österberg & Nilsson, 2009). However, these variables are related to the economic conditions that the cooperatives offer the member, such as transaction cost reduction, prices and economic stability (Ferreira et al., 2021; Franken et al., 2022; Hess et al., 2013).

The above-mentioned studies about farmers' views of their cooperatives are based on data from cross-sectional studies, making it impossible to identify changes over time. A few studies have investigated how members' commitment to their cooperatives has changed over time, but these studies do not provide explanations about the changes. Hakelius & Hansson (2016a; 2016b) found that Swedish farmers' commitment and trust increased from 1993 to 2013. Based on the same dataset, Morfi et al. (2021) investigated members' willingness to be elected representatives, whereby they found that the importance of social capital within the memberships had increased over a period of 20 years. These studies indicate that members' cooperative commitment is high and has even slightly increased over the years. However, these studies concern traditional cooperatives and do not include any hybrid cooperative.

The present study focuses on the long-term consequences of changing cooperative structures for the members of Finnish cooperatives that have a strong position within the country's agricultural sectors. Different agricultural sectors exhibit different forms of cooperative, i.e. both traditional and hybrid cooperatives. This allows analyses of possible heterogeneity in farmers' commitment to their cooperatives.

The aim of this study is to explore how and why members of traditional and hybrid cooperatives have changed their commitment to the cooperatives over a number of years. This implies comparisons of farmers' views at different times and the views of different categories of farmers. So, by introducing different cooperative models as well as a time dimension, this study contributes to the strand of research about farmers' views of their cooperatives.

Section 2 presents a conceptual framework and derives the research hypotheses. Section 3 gives a presentation of the Finnish cooperative sector, from which the data originates. Section 4 describes the econometric methods. The results are presented in Section 5. Section 6 comprises a discussion of the results and Section 7 states the conclusions.

2 | CONCEPTUAL FRAMEWORK

2.1 | Cooperatives' responses to intensifying competition

Many cooperatives have an expansion strategy (Cook, 1995). Through horizontal expansion, it is possible to reap scale economies, thereby reducing the required amount of investment per unit of processed product (Van der Krogt et al., 2007). Horizontal expansion implies that a cooperative maintains its type of operation, ensuring that members still have knowledge about the industry. Nevertheless, horizontal expansion leads to larger and more heterogeneous membership,

making it harder for the farmers to run the cooperatives' operations and, consequently, possibly giving the cooperatives' leadership more power. Governance issues may also arise from larger geographical, organizational and social distances between members as well as between the members and the leadership. Therefore, horizontal expansion is likely to have consequences on the members' commitment to the cooperatives, even if they preserve their traditional cooperative form.

Another way of dealing with intensifying competition is to have differentiation strategies, which are often linked to vertical expansion. Such strategies require considerable investment in downstream or upstream activities. Owing to the members' lack of capital and risk aversion, many cooperatives turn to external investors, giving the cooperative its hybrid character. As members will have to share their residual rights with external owners, the cooperative cannot continue to focus fully on its members (Hogeland, 2015; van der Krogt et al., 2007: Alho, 2015; Nilsson, 2018). Hybrid cooperatives focus on profits. The cooperative may take on operations that are remote from the members' businesses. Vertical expansion may involve further processing of the members' products, processing of non-members' products and undertaking operations that are not related to members.

Vertical expansion does not necessarily affect the membership composition per se, so membership heterogeneity does not present a major problem. However, complex business activities mean that members become less willing or able to govern (Feng et al., 2016; Österberg & Nilsson, 2009). Furthermore, the members' decision-making rights become limited, as the external owners will have representatives on the board. As a result, vertical expansion may lead members to feel increasingly detached from their cooperatives. Large and complex cooperatives are likely to suffer from poor commitment from members, less willingness to invest and less willingness to participate in their governance (Feng et al., 2016; Nilsson et al., 2012).

2.2 | Hypotheses

According to Section 2.1, both horizontal and vertical expansion strategies may have negative consequences for the social capital within cooperative societies. This is to say that the social relationships become weaker and the members' control of the cooperative declines. However, members have another, business related relationship with the cooperative as a business firm. This relationship as well is affected by the horizontal and vertical integration strategies. An interesting question is whether one relationship or the other is the most important one for the members.

The driving force behind the development of the cooperative sector is intensifying competition. Likewise, increasing competition and, therefore, tougher economic conditions lead to fewer and larger farms, whereby the farmers become increasingly dependent on each other (Emery, 2015). Likewise, the farmers become more and more dependent upon the processing firms. This interdependency makes the farmers more committed to their cooperatives—both traditional and hybrid cooperatives. Cooperatives are usually the main provider of income for the farmers. As the farmers are dependent upon the cooperatives for as long as they can foresee, they will probably have a positive image of their cooperatives. One condition is that farmers perceive themselves as being fairly treated. This is achieved when the cooperatives follow the cooperative principle of equal treatment of individual members. At the same time, the competitive intensity forces both traditional and hybrid cooperatives to run their operations as efficiently as possible.

However, the intense competition at all stages of the value chains makes the cooperatives behave in a more business-like way in their dealings with members. This may result in

increasing similarities between the two cooperative types. Farmers may even be uncertain about the ownership structure of their trading partner (Nilsson et al., 2014).

When a traditional cooperative is converted into a hybrid cooperative, the members lose some decision-making power, which in itself may be expected to cause dissatisfaction. On the other hand, the members may get some economic benefits and also hybrid cooperatives defend their members' interests. Therefore, the farmers may gradually get a more positive view of their hybrid cooperatives, even though the loss of decision-making power will remain on the negative side. This discussion gives a hypothesis:

H1: Members of both traditional and hybrid cooperatives have a fairly strong, and even increasing, commitment to their cooperatives.

Despite increasing similarities between the two cooperative models, differences remain. On the one hand, members of hybrid cooperatives have to share both the residual rights and decision-making rights with external investors. The cooperatives are oriented towards vertical integration and profit making. So, they often invest in activities that are not directly related to the members' farm operations. Part of the hybrid cooperatives' activities may be completely unrelated to the members and even run in other countries on the basis of non-members' farm products (Ollila et al., 2014). Members of traditional cooperatives, on the other hand, are the sole owners and decision-makers. They are, therefore, focused on the processing of farm products, not having financial resources to invest in other business activities. However, members of a traditional cooperative are more likely to care about their cooperative (Borgen, 2001; Morfi et al., 2015; Nilsson, 2023). The cooperative societies of hybrid cooperatives have the primary task of owning stock in a joint-stock company, even though earnings from this ownership are paid to the members in the form of product prices. Based on this, a second hypothesis is stated:

H2: Members of traditional cooperatives tend to be more committed to their cooperatives than members of hybrid cooperatives.

3 | AGRICULTURAL COOPERATIVES IN FINLAND

This section presents Finnish agricultural cooperatives as organized at the time of data collection between 2010 and 2016. During that period, there were no structural changes in the cooperative sector, but some restructuring has since occurred.

Most Finnish farmers work in animal husbandry, producing dairy products, pork, beef, poultry and eggs. In all agricultural sectors, cooperatives have maintained a strong position for decades. Farmers are typically members of cooperatives in several agricultural industries. A couple of foreign cooperatives have operations in Finland, but Finnish farmers are not members of them, solely suppliers. There are profit-oriented firms in all agricultural industries. With the exception of some small units, Finland has neither farm supply cooperatives nor grain marketing cooperatives.

Cooperatives within different agricultural industries have different organizational structures. The present study focused on dairy cooperatives and meat cooperatives. Dairying and meat production are by far the largest agricultural industries in Finland and both are dominated by cooperatives. Dairy cooperatives have a traditional form, while meat cooperatives have a hybrid form with capital from external sources.

Slaughterhouses deal with pigs, dairy cows and calves, beef cattle, chickens and laying hens. There are four primary cooperatives in the meat sector, but none conducts their business within a cooperative society except in relation to the collection of slaughter animals from suppliers and the provision of supplier services. The remainder of the operations take place in one of the two limited companies that the societies own with external financiers. The cooperatives' main function is, therefore, to hold stock in the corporate firms (Pyykkönen et al., 2012). Three cooperatives control one of the limited companies (Atria) with investors at the Helsinki Stock Exchange, while the fourth owns stock in another limited company (HK Scan), which is also listed on the stock exchange. The two meat companies compete in the market for slaughter animals and for finished products.

The farmers consider the limited companies to be cooperatives because, thanks to the use of two kinds of stock, the cooperative societies have the majority of the votes. The cooperative societies mainly have stock with ten times more voting power than the holdings owned by external investors. The limited companies' capital is invested in value chains for meat products. These operations also include production in neighboring countries, with products bought from producers in these countries (Ollila et al., 2014).

The dairy sector is dominated by a limited company (Valio Ltd.), which is owned by seventeen local and regional dairy cooperatives. All follow traditional cooperative principles with equal voting rights and boards consisting solely of farmers, etc. (Ollila & Pyykkönen, 2012). All their equity comprises suppliers' shares and accumulated earnings. The milk price is equal for all dairy farmers within each cooperative. The jointly owned limited company takes care of a large part of the cooperatives' processing and marketing activities on behalf of the cooperatives. Some cooperatives sell all of their milk to the limited company, while others let the limited company process some of their milk or collaborate with other partners. The limited company is also responsible for export activities and has considerable sales from dairy technology licences worldwide. It runs dairy processing in Russia and Estonia, although producers in these countries are solely milk suppliers. There is competition from a few small dairy cooperatives as well as a multinational dairy processor.

The limited dairy company has statutes, implying that its ownership and governance structures make it operate like a second-tier traditional type of cooperative. Its governing bodies mainly consist of farmers. It pays the same milk price to all the owner cooperatives. Its equity comes from the owner cooperatives as well as accumulated earnings. The profits are paid to the owner cooperatives in proportion to their volumes of milk delivered, although some is saved in unallocated funds. Even the profits from the sales of dairy technology licences are distributed in the same way to the owner cooperatives.

The consolidation of cooperatives in the dairy and meat sectors has occurred in different ways. In the 1980s, there were discussions about merging all local and regional dairy cooperatives into one single cooperative, which would have a nation-wide monopolistic and monopsonistic status, but this idea never came to fruition. Instead, the decision was made to establish the jointly owned limited company that exists today, which would partly fulfil the same purpose. There were never any serious discussions about a hybrid dairy cooperative such as the one in the meat cooperative sector.

In the meat industry, the shift from traditional cooperatives to hybrid ones took place gradually. In the late 1980s, there was such competition between the various traditional meat cooperatives that their earnings suffered. An early step was to establish fully owned subsidiaries. The cooperatives then acquired slaughter firms and some cooperatives merged. When these measures of merging activities did not strengthen, i.e. did not successfully increase the competitiveness

of, the cooperatives, the idea of involving external ownership arose. At first, the cooperative decision-makers thought that members' interests would be protected if stock with limited voting power were introduced on the stock exchange. However, as further acquisition opportunities presented themselves, the amount of stock listed on the stock exchange had to increase, even though the cooperatives retained the majority of the votes. Throughout this restructuring process, debate raged in Finland about issues of corporate governance in collectively run cooperatives (Österberg, J., & Nilsson, 2009; Borgström, 2013; Holmström, 1999; Pellervo Confederation of Finnish Cooperatives, 2000).

4 | METHODOLOGY

4.1 | Data collection

In order to collect data for comparisons over time, a repeated cross-sectional design was selected. In this way, identical questions were sent to a selection of Finnish farmers in 2010, 2013 and 2016. A repeated cross-sectional survey design means that the same individuals do not complete the surveys. Data from different periods can also be collected via a panel data design, whereby the same sample of respondents is surveyed in different data collection rounds. However, this kind of approach could not be used without adjusting for structural change in the population of farmers when representativeness is required. Compared with the first collection of data, the respondents of the second and third surveys will be older and the composition of cooperative members versus non-members will have changed. The structural development in Finnish agriculture means that the sample size may perhaps have been reduced to about 10% fewer farmers in 2016 than in 2010. Consequently, a panel data design would have given biased results.

The datasets were collected by a market research company that conducts omnibus surveys of samples of Finland's farming population, both members and non-members of cooperatives, on behalf of different organizations in the agro-food sector. The surveys are conducted twice a year and have been running for decades. The company's surveys were conducted at times when the farmers' workload was less intense, namely once in the spring and twice in the autumn. The respondents could submit completed questionnaires either by post or electronically. As a market research company collected the data, it was not possible to send reminders to non-respondents or analyse any non-response bias. The market research company ensures that representativeness is guaranteed in its sampling procedure.

The market research company used the same data collection procedures in all three survey years. For the present study, a set of identically phrased questions was included in the market research company's questionnaires. The sample in 2010 consisted of 2,400 farmers, of whom 1,296 responded, corresponding to a response rate of 47.3%. In 2013, there were 677 responses, corresponding to a response rate of 37.6%. The survey in 2016 comprised 3,345 farmers, of whom 1,021 responded, i.e. the response rate was 30.5%. The majority of respondents were cooperative members.

In all three surveys, many respondents did not complete the questionnaire in full. Missing values were treated as missing. No attempts were made to impute these values because the values referred to respondents' personal views and opinions. The three datasets were merged. In doing so, some information was lost because the datasets did not fully correspond with each other. The merged dataset therefore contained a total of 2,631 observations.

4.2 | Variables

4.2.1 | Dependent variable

Owing to the hybrid cooperatives' downstream and foreign operations, as well as the influence of external investors, the commitment of members to these cooperatives may diverge from the cooperative ideology that characterises traditional cooperatives, i.e., the conception of cooperatives as expressed by traditional cooperative principles. In order to shed light on how farmers are affected over time by the character of their cooperatives, the members' view of their cooperative was operationalised in the questionnaire as: *"Cooperative ideology keeps me a member of my cooperative"*. This questionnaire item was treated as the dependent variable within the analysis. The respondents were asked to answer on a Likert scale, ranging from 1 (fully disagree) to 5 (fully agree). It cannot be ruled out completely that respondents interpret cooperative ideology differently. This raises the potential problem of biased results. However, to minimise this problem within the econometric model, several control variables were used to characterise the farmers in the sample. It is assumed that similar farmers (with respect to their characteristics, e.g. type of farm, type of cooperative to which they belong, number of animals they own) interpret cooperative commitment and ideology in a similar way.

4.2.2 | Independent variables

The questionnaire contained a number of questions that may explain the respondents' answers to the above-mentioned issue. To model the development of the cooperative commitment over time, the year of observation has been included in the analysis: 2010, 2013, and 2016. Several items were included in the omnibus questionnaire. Most of these were to be answered by a number. The variables are presented in table A1. The sample included farmers who deliver to a traditional dairy cooperative and to an investor-owned dairy processor (IOF). For the meat producers, two hybrid cooperatives, a subsidiary of one of them and two IOFs were included in order to represent their distribution channels. This information provides the possibility of investigating differences in farmers' views of the cooperative ideology in multiple ways: (i) cooperative members can be differentiated from producers who deliver to IOFs, (ii) the view on the cooperative ideology of members who deliver to a traditional dairy cooperative can be compared with meat producers delivering to hybrid cooperatives or their subsidiary, and (iii) it enables a general comparison of dairy and meat-producing farmers.

Other variables were designed specifically for this study. Respondents were asked to indicate the specific cooperatives to which they belong. Furthermore, it was asked for members' views on competition from other farmers. The respondents were asked to state either 1 (I regard them as competitors) or 2 (I do not regard them as competitors) for each of the following six categories: (i) my neighbor in the same field of production, (ii) members in the same cooperative as me, (iii) members of other cooperatives, (iv) farmers who sell to investor-owned firms, (v) producers in neighboring countries in the same field of production and (vi) producers in neighboring countries delivering to the same firm as me. The questionnaire asked for a statement regarding the members' views on the cooperative's internationalization activities: "My cooperative must invest in internationalization" and "Anyone who delivers to my cooperative must also be a member" where the respondents were asked to answer on a Likert scale, ranging from 1 (fully disagree) to 5 (fully agree).

Other variables were included that revealed respondents' views on the benefits of cooperative membership where they were asked to give answers to the following statements on a Likert scale, ranging from 1 (fully disagree) to 5 (fully agree): (i) "Membership offers protection against large buyers", (ii) "Following my own interests and making advances through the power of the cooperative", (iii) "Membership is purely a business decision for me" and (iv) "Members' long-term experience of cooperation".

4.3 | Statistical analyses

The dependent variable *y* ("cooperative ideology keeps me a member") is discrete, while the order of discrete categories has a meaningful interpretation, such as "increasing order of answers" or, in the present case, Likert categories of 1 to 5 implying subsequently higher levels of agreement regarding the degree to which cooperative commitment may keep the respondent a member of the cooperative.

In general, an ordered logit or ordered probit model applies to surveys where the dependent variable represents an ordinal ranking (as in the present case):

$$y = Likert\ category\ 1 < y = Likert\ category\ 2 \tag{1}$$

The more frequently used multinomial logit model does not restrict the discrete outcomes to be ordered (e.g. $y =$ "*wheat*" versus $y =$ "*maize*", etc. would be sufficient for a multinominal approach, but not for an ordered approach). The probabilities, which enter the log likelihood function in an ordered probit model, can be stated as follows (Greene & Hensher, 2010):

$$P(y_i = j) = P\left(y_i^* \ if\ within\ the\ j^{th}\ category\ of\ y_i\right) \tag{2}$$

By this approach, the empirical effect of each explanatory variable on the probability of a respondent's answer falling into one of the observed $j = 1, \ldots, 5$ (Likert) categories of the dependent variable is estimated.

However, variables related to farmers' stated opinions about cooperative commitment or motivation and the status of their cooperative memberships are endogenously related to the redistribution policies of the cooperatives' economic surpluses. It can be expected that the stated cooperative commitment and internal redistribution policies are mutually related within cooperatives, since provision of the service and redistribution of earnings are the very reasons for their existence. Therefore, the analysis has to take the following steps into account: First, in each survey year, the endogenous self-selection of farmers into one of the groups of members or non-members. This provides an opportunity to test empirically whether members changed their views over time or if the composition of members changed due to some, for example, being dissatisfied with the way in which any surplus was returned and dropping out. Second, endogenous effects of time for each of the three survey years. Structural change, changing market conditions, changing lifestyles, etc. affect members' views on cooperative commitment. An endogenous treatment effect may occur for variables that define the view on internationalisation strategies and the development of a cooperative mentality.

Due to the endogeneity of these variables, the hypotheses were assessed based on an ordered probit model that accounts for endogenous sample selection in the group of members and the

exogenous treatment effects of time, as represented in the three survey periods. The estimations were conducted using the eoprobit command in Stata 17 (StataCorp LLC, 2019).

The three-staged regression model including a sample selection and endogenous treatment component, therefore, took the following general form for $I = 1, \ldots, N$ questionnaires:

$$y_i^* = X_{ki}\,\beta + W_{ci}\beta_c + V_{ti}\beta_t + e_{cit} \tag{3}$$

where e_{cit} is the composed error term following a standard normal distribution. The above model was estimated via pseudo maximum likelihood with $k = 1, \ldots, K$ explanatory variables in the vector $\mathbf{X}$, $c = 1, \ldots, C$, sample selection regressors represented in $W_{ci}\beta_c$, explaining the motives for cooperative membership, and $t = \{2010,\ 2013, 2016\}$ treatment effect regressors $V_{ti}\beta_t$, providing explanations for the development of cooperative commitment over time. An overview of the mapping of the variables included in the estimated model to the respective vectors $\mathbf{X}$, $\mathbf{W}$ and $\mathbf{V}$ is presented in Table A1.

A disadvantage of the ordered probit approach is that marginal effects on y of a one-unit change in x are not directly given by the estimated coefficients. Therefore, neither the sign nor the magnitude of the estimated β receives a direct interpretation. Instead, marginal (also known as "partial") effects have to be calculated separately (Greene, 2003), according to the first-order partial derivatives:

$$\frac{\partial P(\,y_i = \ j|x)}{\partial x} \tag{4}$$

These marginal effects for a given regressor, when added, should sum to zero by cancelling each other out across the response categories. The coefficients (dy/dx), therefore, reflect the estimated change in the dependent variable after a one-unit change in the corresponding explanatory variable. In order to detect multicollinearity, variance inflation factors (VIF) were computed in preliminary tests, with VIF up to the critical level of 5 tolerated.

To establish the effect of the observed year on the importance of the cooperative ideology, the average treatment effect of the discrete treatment variable t_i "survey year" (taking $\upsilon_1, \ldots, \upsilon_T$ levels for j treatment groups with 1 = 2010 as a base, 2 = 2013, 3 = 2016) was calculated for every outcome category h of the dependent variable (Wooldridge, 2010):

$$ATE_{hj} = E\left\{1\left(y_{ij} = \upsilon_{ij}\right) - 1\left(y_{1j} = \upsilon_h\right)\right\} = E\left\{TE_{hj}\left(x_i\right)\right\} \tag{5}$$

5 | RESULTS

5.1 | Descriptions of the samples

As seen in Table 1, the number of respondents fell from 1,206 to 831 during the investigated period. This reflects the structural change in Finnish agriculture in general. Similarly, the number of cooperative members fell from 915 to 522. The share of cooperative members rose from 2010 (76%) to 2013 (83%), but fell in 2016 (63%). This development indicates flexibility, perhaps in response to changing market conditions, and the existence of opportunities to deal with firms that have different ownership structures.

TABLE 1 Descriptive statistics of the sample composition in each survey year.

Variable	Year	Total Sample Size	Number of cooperative members	Share of cooperative members (%)
Members of cooperatives	2010	1,206	915	76
	2013	903	748	83
	2016	831	522	63
Members in traditional cooperatives	2010	1,206	297	25
	2013	903	218	24
	2016	831	225	27

TABLE 2 The size of operation of the farms surveyed in each survey year.

Variable	Year	Number of farmers	Total Sample Size	Share of the total sample (%)	Minimum number of animals / size	Maximum number of animals / size
Dairy farmers	2010	308	1,206	25.54	1	200
	2013	227	903	25.14	1	230
	2016	247	831	29.72	1	185
Meat producers (cattle)	2010	413	1,206	34.25	1	480
	2013	75	903	8.31	1	145
	2016	72	831	8.66	1	140
Meat producers (pigs)	2010	105	1,206	8.71	1	1850
	2013	60	903	6.64	1	3200
	2016	32	831	3.85	1	2000
Acreage (hectares)	2010		1,206		0	690
	2013		903		0	990
	2016		831		0	599

Table 2 shows that, in the years from 2010 to 2013, there was a trend towards larger acreages, more dairy cows and more sows on average. For the average number of mother cows and piglets, the trend reverted in 2016 compared with 2013. Similarly, the maximum number of animals on any of the farms in the sample indicated a general trend towards large-scale operations, especially compared with the first year. The fact that the maximum number of dairy cows and number of piglets fell between 2013 and 2016 may indicate disinvestment among very large farms or an intentional split-up of large businesses due to tax regulations or incentives set by agricultural policy. For the analysis, the categories that capture the number of animals per farm differentiate between dairy cows, cattle for meat production and pigs, as these characteristics are assumed to control for the farmers' sales channel and may also capture their individual evaluation of cooperative ideology.

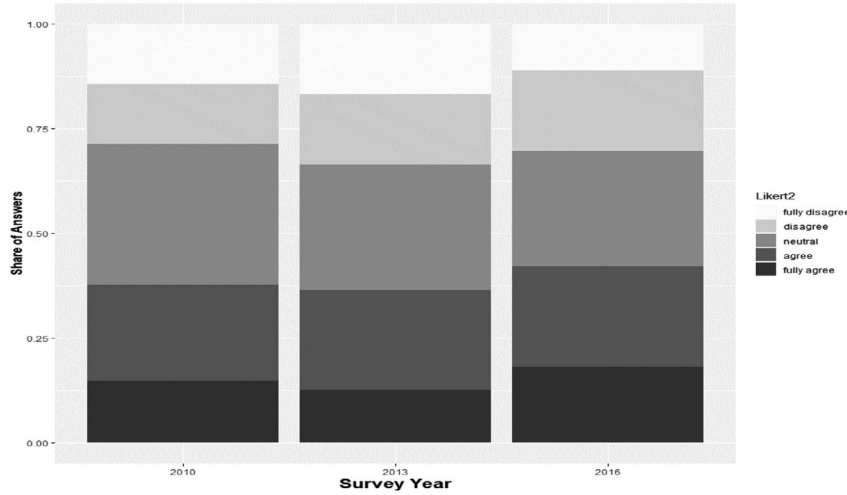

FIGURE 1 Responses to the statement "Cooperative ideology keeps me a member of my cooperative".

5.2 | Farmers' cooperative commitment over time

Figure 1 shows the respondents' responses to the statement "Cooperative commitment keeps me a member of my cooperative" for each of the three survey years. In 2013, when the share of cooperative memberships was at its highest (83%) (Table 1), cooperative commitment was at its lowest. In 2016, the share of cooperative memberships was at its lowest (63%), but 2016 saw the highest share of farmers who fully agreed with cooperative commitment as a reason for remaining in their respective cooperative.

This finding can be explained by structural changes within the composition of the member groups. A high share of membership goes along with a relatively large number of members who have an opportunistic attitude towards cooperatives. When the cooperatives' performance is less attractive than that of another business partner, farmers may abandon their cooperatives. Therefore, an explanation for the smaller share of cooperative members in 2016 may be that the farmers who have remained in the cooperative are those who feel the most cooperative commitment.

This may indicate a trade-off between a large number of members on the one hand and member commitment on the other. Farmers who were only slightly committed in the preceding years will have left their cooperatives by 2016 and the remaining members are more committed. The reverse relationship between cooperative membership and farmers' commitment requires an explanation. It is hypothesized that the farmers' changing views may be related to the character of the cooperatives' members, not least the cooperatives' character as traditional or hybrid. This character may be related to the farmers' production orientation, their age or their assessment of the cooperatives.

5.3 | Why cooperative members have stayed or left

The estimation strategy outlined in Section 4.3 was used to analyse simultaneously the determinants of cooperative membership, the effect of the respective survey year and the farmers' cooperative commitment. Table 3 presents the estimation results from the first stage of this

TABLE 3 Determinates of cooperative membership. Dependent variable: Member = 1 if yes.

Variable	Coeff.	Robust std. err.	*z*	*P* > |*z*|
Dependent variable: Membership in a cooperative (yes = 1)				
Competitors: in the same field of production (yes = 1)	−0.091	0.096	−0.95	0.3420
Competitors: in the same cooperative as me (yes = 1)	0.593	0.107	5.53	0.0000
Competitors: sellers to other companies (yes = 1)	0.189	0.065	2.91	0.0036
Competitors: members of other cooperatives (yes = 1)	0.161	0.108	1.49	0.1373
Farmer's year of birth	0.004	0.002	2.02	0.0437
Acreage of the farm	0.001	0.001	0.64	0.5205
Gender (female = 1; male = 2)	0.037	0.092	0.40	0.6884
Full-time farmer (yes = 1)	0.048	0.055	0.87	0.3872
Years left in farming	−0.174	0.024	−7.16	0.0000
Number of dairy cows	0.012	0.003	3.93	0.0001
Number of cows for meat production	0.001	0.001	0.59	0.5541
Number of pigs	0.001	0.000	3.34	0.0008
Constant	−0.301	0.221	−1.36	0.1727
Correlation of errors: cooperative membership and commitment	0.317	0.064	4.98	0.0000

simultaneous estimation where it was estimated whether, and to what extent, structural factors may explain farmers' characteristics that determine whether a farmer joins a cooperative or not. The estimation results refer to vector **W** in Equation (1), including the variables mapped to this vector according to Table A1.

There may be differences between the various cooperative industries with regard to whether farmers' cooperative commitment affects their willingness to be members. Therefore, Table 3 shows a relationship between members' characteristics and especially their views on competition with other farmers and their membership.

Farmers' willingness to be members may be related to their *perception of competition*, such as whether they think that members of their own cooperatives or suppliers to other processing firms are competitors (as opposed to collaborative partners) (see "competition" variables, Table 3). Table 3 shows that there is a greater likelihood of membership among farmers who consider other members of their own cooperative, as well as suppliers to other companies, more as adversaries. This indicates that the members may regard their membership in a cooperative as offering protection against competition from other producers. Furthermore, with respect to competitiveness with other members of the cooperative, there is a limited feeling of community within the memberships or the members are disappointed because they would like to have more of a sense of community. It can be seen that a higher competitive spirit overall or a greater threat from other producers makes the farmers more likely to belong to a cooperative.

Table 3 shows that *producers with a large number of animals* are more likely to be cooperative members. Farmers with a large number of dairy cattle are generally more likely to belong to a cooperative compared with farmers who keep cattle for meat production. Likewise, a larger

number of pigs has a positive effect. This supports the hypothesis that the hybrid cooperatives, which dominate the meat-processing sector, may have business relations that are attractive, especially for large-scale producers. These producers may not be interested primarily in cooperative values. However, in the dairy sector, the traditional cooperative character seems to prevail.

The farmers' *acreage* is of no importance, which is explained by the fact that the number of animals is not strictly related to acreage and the farmers investigated mainly work in animal husbandry. Neither the farmers' *gender* nor whether the farmers have *full-time or part-time* agricultural activities has a statistically significant effect as a determinant of cooperative membership. These findings are noteworthy, as part-time farmers may be less dependent on their agricultural operations and, therefore, more likely to choose a business partner who is reliable and easy to deal with. The *age* of a farmer has a positive effect on cooperative membership. Since younger farmers are generally more business-oriented and often more indebted than older farmers, they are less likely to stick with a specific trading partner.

The number of years until a member plans to retire has a significant negative relationship regarding the effect of commitment on cooperative membership. This indicates that a longer time horizon for continuing farming may increase the probability of being a member of a cooperative. Therefore, this variable not only says something about a member's age, but also about whether financial difficulties may cause a member to stop farming.

5.4 | Cooperative commitment as a reason for membership

The next step is an analysis of what determines whether cooperative commitment or ideology is a reason for membership. This was tested in the second part of the simultaneous estimation approach of the extended ordered probit model procedure outlined in Section 4.3. The effects of the included variables of the vector X (see Table A1) on the cooperative ideology as a factor that keeps a farmer a member in a cooperative were tested in this context.

Answers to this question were recorded on a five-point Likert scale, for which increasing values implied increasing agreement with this statement (see Figure 1). The five levels of the outcome variable were addressed through derived marginal effects of the ordered probit model that refer to each of these categories separately. In other words, the model predicts the partial effect of a one-unit change in each of the explanatory variables on the probability that a recorded answer will fall into the specific outcome category of the dependent variable. These marginal effects are displayed in Table 4.

The marginal effects in the table can be interpreted as follows: dairy farmers who deliver to an IOF have an 8.26% lower probability to "fully agree" that cooperative ideology would ensure they remain a member of a cooperative. In contrast, delivering to a traditional cooperative has a statistically significant positive effect on the perceived importance of cooperative ideology (marginal effect of 3.25%). In the case of meat-producing farmers, the model shows that differences exist both between different hybrid cooperatives and between different IOFs. While delivering to the hybrid cooperative labelled *A* shows a positive effect of cooperative commitment, delivering to a cooperative's subsidiary reveals at least a slightly negative effect on the commitment (marginal effect of −0.92% to agree on the importance of cooperative ideology). Furthermore, delivering to hybrid cooperative *B* has no statistically significant effect on cooperative commitment. Producers delivering to this cooperative do not evaluate cooperative commitment to be a reason for or against membership. Instead, it seems that the cooperative is seen as a trading platform independent from ideological values. Delivering slaughter animals to IOFs furthermore indicates an

TABLE 4 Marginal effects (dy/dx) of the extended ordered probit regression.

Dependent variable: "Cooperative ideology keeps me a member"						
Explanatory Variable		**Fully disagree**	**Agree**	**Neutral**	**Agree**	**Fully agree**
Dairy farmer delivering to an IOF	dy/dx	0.0975	0.0457	−0.0014	−0.0592	-0.0826
	$P > \|z\|$	0.0000	0.0000	0.8183	0.0000	0.0000
Dairy farmer delivering to a traditional cooperative	dy/dx	−0.0383	−0.0180	0.0005	0.0233	0.0325
	$P > \|z\|$	0.0062	0.0075	0.8142	0.0050	0.0128
Meat producer delivering to hybrid cooperative A	dy/dx	−0.1319	−0.0618	0.0019	0.0801	0.1117
	$P > \|z\|$	0.0000	0.0000	0.8192	0.0000	0.0000
Meat producer delivering to hybrid cooperative B	dy/dx	−0.0300	−0.0140	0.0004	0.0182	0.0254
	$P > \|z\|$	0.0723	0.0771	0.8313	0.0669	0.0586
Meat producer delivering to a subsidiary of a hybrid cooperative	dy/dx	0.0152	0.0071	−0.0002	−0.0092	−0.0129
	$P > \|z\|$	0.0431	0.0719	0.8210	0.0372	0.0622
Meat producer delivering to IOF A	dy/dx	0.0598	0.0280	−0.0009	−0.0363	−0.0507
	$P > \|z\|$	0.0000	0.0000	0.8207	0.0000	0.0000
Meat producer delivering to IOF B	dy/dx	0.0405	0.0190	−0.0006	−0.0246	−0.0343
	$P > \|z\|$	0.0136	0.0305	0.8106	0.0159	0.0321
Competitors: in the same field of production	dy/dx	−0.0017	−0.0008	0.0000	0.0010	0.0014
	$P > \|z\|$	0.8923	0.8923	0.8833	0.8925	0.8926
Competitors: members of my cooperative	dy/dx	0.0448	0.0210	−0.0006	−0.0272	−0.0380
	$P > \|z\|$	0.0001	0.0025	0.8181	0.0002	0.0011
Competitors: members of other cooperatives	dy/dx	0.0183	0.0086	−0.0003	−0.0111	−0.0155
	$P > \|z\|$	0.2087	0.2293	0.8274	0.2053	0.2151
Competitors: suppliers to other companies	dy/dx	−0.0040	−0.0019	0.0001	0.0024	0.0034
	$P > \|z\|$	0.8544	0.8552	0.9013	0.8542	0.8543
Farmer's age	dy/dx	0.0017	0.0008	0.0000	−0.0010	−0.0014
	$P > \|z\|$	0.0000	0.0001	0.8196	0.0001	0.0000
Acreage of the farm	dy/dx	0.0001	0.0001	0.0000	−0.0001	−0.0001
	$P > \|z\|$	0.3694	0.3743	0.8435	0.3644	0.3581
Gender (1 = female, 2 = male)	dy/dx	−0.0051	−0.0024	0.0001	0.0031	0.0043
	$P > \|z\|$	0.6928	0.6894	0.7877	0.6939	0.6947
Full-time farmer	dy/dx	0.0029	0.0014	0.0000	−0.0018	−0.0025
	$P > \|z\|$	0.6995	0.7011	0.8387	0.6970	0.7027
Years left in farming	dy/dx	−0.0074	−0.0035	0.0001	0.0045	0.0062
	$P > \|z\|$	0.4047	0.4122	0.8411	0.3900	0.4072
Survey year = 2013	dy/dx	−0.3203	−0.0168	0.025	0.0632	0.2489
	$P > \|z\|$	0.0000	0.0003	0.0000	0.0000	0.0000
Survey year = 2016	dy/dx	−0.5020	−0.0646	−0.0360	0.0367	0.5660
	$P > \|z\|$	0.0000	0.0000	0.0001	0.0000	0.0000
Number of dairy cows	dy/dx	0.0000	0.0000	0.0000	0.0000	0.0000
	$P > \|z\|$	0.9478	0.9477	0.9572	0.9477	0.9476

(Continues)

TABLE 4 (Continued)

Dependent variable: "Cooperative ideology keeps me a member"						
Explanatory Variable		**Fully disagree**	**Agree**	**Neutral**	**Agree**	**Fully agree**
Number of cattle for meat production	dy/dx	0.0003	0.0001	0.0000	−0.0002	−0.0002
	$P > \|z\|$	0.0000	0.0000	0.8160	0.0000	0.0000
Number of pigs	dy/dx	0.0001	0.0000	0.0000	0.0000	−0.0001
	$P > \|z\|$	0.0000	0.0000	0.8115	0.0001	0.0001

aversion to cooperative commitment (marginal effect of 5.98% for *IOF A* and 4.05% respectively for *IOF B* to fully disagree on the importance of cooperative ideology for remaining a member of the cooperative). This signals that meat producers who currently deliver to IOFs do not want to switch to a cooperative.

Table 4 (rows with "competition" variables) shows how farmers view cooperative ideology when they have stated that their main competitors are fellow members or suppliers to investor-owned firms. It shows that the perceived competition is related to cooperative commitment in a different way to cooperative membership (Table 3). As expected, farmers who consider fellow members to be competitors are less likely to agree or fully agree with cooperative commitment as a reason for membership. This indicates that the respondents do not interpret cooperative commitment in terms of segregation from non-cooperative members. Instead, this view is primarily related to internal member attitudes and membership structure. Cooperative commitment on average does not seem to be a concept against other farmers. Rather, it explains whether members enjoy collaborating with other members.

According to the marginal effects, farmers with a large acreage are not less likely to agree or fully agree with cooperative commitment as a reason for membership. Nevertheless, farmers with a larger number of cattle for meat production are less likely to agree or fully agree with cooperative commitment as a reason for membership. The same is true for pig farmers: if their farm size increases, the probability of perceiving cooperative ideology as a reason for membership declines. In contrast, the farmers' number of dairy cows is not statistically related to their cooperative commitment. If farmers belong to a traditional (dairy) cooperative, it is likely that farm size no longer affects their view of cooperative ideology. In the dairy sector, large-scale farmers are committed to cooperative ideologies in the same way as small-scale farmers and do not seem to be driven by pure business strategies, which is in contrast to their beef cattle farming colleagues.

Socioeconomic factors indicate some statistical effects. Older farmers (with an earlier birth year and with fewer years left as farmers) are less attracted to cooperatives. Younger farmers are more likely to agree or fully agree with cooperative commitment as a reason for membership.

5.5 | Development of cooperative commitment

The results of the endogenous treatment effect estimation as part of the three-step ordered probit model take the endogeneity of variables into account. These vary with respect to the year of observation (see variables with the vector symbol **V** in Table A1). In line with the summary of descriptive statistics depicted in Figure 1, the results of the estimation of endogenous treatment effects show that the ideological connection to the cooperative is of increased importance in later years of observation. In comparison with 2010, the importance of cooperative ideology in 2013 and

2016 increased by about 23% and 58% respectively (see Table A2 – average treatment effects). With regard to the decreasing number of members of cooperatives, this can be interpreted in two ways: over the years, belonging to a cooperative as a sales channel has become an ideological decision and only those members who feel a certain degree of cooperative ideology tend to remain members of the cooperatives. This is especially true for meat producers with a small number of animals and for dairy farmers who belong to a traditional cooperative. In other words, while membership in cooperatives declined overall, the average amount of cooperative ideology among the remaining members appeared to stabilize, if not increase. The age of a farmer supports this suggestion, as younger farmers in general are less likely to belong to a cooperative, but, if they do join, they are motivated by cooperative ideology on a higher level.

Furthermore, the effects of the endogenous treatment variables (listed in Table A3) indicate that, in 2013 and 2016, the cooperative commitment was positively related to the functions of cooperatives that provide protection and the possibility of benefiting from their cooperatives. In contrast, using the cooperative as a pure business partner became less popular over the years. Farmers' views on cooperatives' investment in unrelated business operations and in internationalisation do not seem to have become more important over the years and had no statistically significant effects with respect to the members' cooperative commitment. This finding is interesting because it rejects the core idea that cooperative commitment depends on redistribution of earnings and is in potential conflict with internationalisation strategies. Nevertheless, it is becoming increasingly clear that it is more important that only members of the cooperative be accepted as suppliers. The significantly positive sign of the coefficient for the variable "*Anyone who delivers to my cooperative must also be a member*" implies that farmers with a strong cooperative commitment prefer exclusive delivery conditions, perhaps in order to prevent free-riding on cooperative benefits. According to the results, this effect seems to have become stronger over the years of data coverage.

6 | Discussion

The findings presented above support the hypotheses. Among members of both traditional and hybrid cooperatives, member commitment was relatively strong and increased slightly in the survey period 2010–16 (Hypothesis 1). Member commitment among dairy farmers, i.e., in the traditional cooperatives, was higher than that among cattle breeders, i.e., in the hybrid cooperatives (Hypothesis 2). Table A2 shows the development towards increasing commitment over the years, while Table 4 shows the effects of traditional and hybrid cooperatives.

A reason for these findings is structural changes in primary agriculture. When farmers expand their operations and the number of farmers falls, the economic relationships between the remaining farmers and cooperatives become closer (Hakelius & Hansson, 2016a; Morfi et al., 2021; Ollila et al., 2014). The processing firms become more dependent on farmers with large delivery volumes and large-scale farmers are dependent on the processing firms for handling their produce (Emery, 2015). This interdependence forces cooperatives of both organizational types to act in a strictly commercial way in relation to their suppliers (Franken, Cook and Pennings, 2022). So, when the respondents state that they are committed to their cooperatives, they are referring mainly to their economic relationships with the cooperative business firms and less to the social cohesion within the cooperative societies. A consequence of the commercial relations is that the tensions inherent in the hybrid cooperatives between members and external investors ease, although they do not disappear entirely (Alho, 2015; Ollila, 2015).

The findings show that farmers primarily have economic motives for belonging to a cooperative, but their commitment can also be seen as related to socio-psychological factors like cooperative ideology, the core element of which is that a cooperative should promote members' economic interests. Thereby, economic and social variables are intertwined (Ajates, 2019). As a result, the cooperatives will support their members and the farmers will remain loyal as long as the cooperatives adapt to changing market conditions and farmers' needs. Also, young farmers could potentially be attracted by cooperative ideology, even though many young farmers do not realise that cooperatives are important for the reduction of transaction costs in the ever more globalised markets (Ajates, 2019, 2020).

If the market pressure increases for a farmer and alternative selling options are limited, as is often the case in Finland, a cooperative membership provides an attractive marketing platform even though the motive for this membership is not ideology per se (Ajates, 2020).

As the conversions of the former traditional cooperatives into hybrid cooperatives took place gradually over several decades, farmers became accustomed to the hybrid cooperatives' attributes. Farmers may also realise that it is better to have a hybrid cooperative than no cooperative at all and they have learnt that both traditional and hybrid cooperatives have to adhere to the commercial rules of intense competition. Likewise, technological developments contribute to making the power balance between farmers and processing firms of all kinds less skewed. Thanks to modern information technology, farmers are better informed about market prices and other conditions, and improved logistic solutions reduce the problem of limited spatial competition. Large-scale farmers can deliver a full truckload of produce over long distances, thereby saving costs for the processing firms. So, the cooperatives and their members increasingly depend upon each other, which explains why members' commitment to both traditional and hybrid cooperatives increased during the period observed.

The members of the two types of cooperative rank differently in terms of their cooperative commitment and there are differences compared to farmers who deliver to non-cooperatives. The fact that members of traditional cooperatives demonstrate a somewhat stronger cooperative commitment than members of hybrid cooperatives is likely to depend on the characteristics of the individual cooperatives rather than the type of organization per se. There are differences between cooperatives that have the same organizational structure. One of the hybrid cooperatives is appreciated more by its members than another hybrid cooperative. Even though two cooperatives have the same ownership structure, one of them is better at satisfying the farmer members' demands and interests (Ollila & Pyykkönen, 2012).

Traditional dairy cooperatives follow established cooperative principles with regard to ownership, trade conditions and governance. However, local and regional cooperative societies have placed a large part of their business operations in a jointly owned limited company. This organization functions as a second-tier traditional cooperative, with statutes incorporating cooperative principles. The dairy cooperatives have mainly chosen a strategy of horizontal expansion in an attempt to acquire market power. The dairy farmers appreciate their cooperatives adhering to traditional cooperative principles. Despite structural changes that affected the dairy sector in the past, farmers' membership in a cooperative is, nonetheless, stimulated by cooperative commitment and dependence on services provided by the cooperative.

The answers to the question about whether the farmers' main competitors are members within their own cooperatives or those supplying other cooperatives or IOFs indicate that cooperative commitment is related more to a cooperative's performance and less to the community within the cooperative society (Fulton & Giannakas, 2013; Nilsson et al., 2012). This

indicates that cooperative commitment is a matter of economic benefits offered by the respective cooperative.

Large-scale members of hybrid cooperatives are less committed to their cooperatives, probably because they have better opportunities to switch to another processing firm. Some members of hybrid cooperatives think that these cooperatives focus on non-member and foreign operations, and are, therefore, less oriented towards members. Nevertheless, these members think that hybrid cooperatives embrace traditional cooperative values, which are reasons for farmers to remain as members.

7 | CONCLUSIONS

This study explored how the commitment of Finnish farmers to their cooperatives has changed over a six-year period from 2010 to 2016. The data originated from Finnish dairy and meat producers who are members of traditionally organized cooperatives and hybrid cooperatives respectively. In the period between the first and third surveys, there were no organizational changes in either of the cooperative sectors.

The results indicate that the members of both types of cooperative exhibit a fairly high degree of cooperative commitment, particularly in the traditional cooperatives but also in the hybrid cooperatives. Minor changes can be identified over the years. For example, the cooperative commitment of members has increased.

However, there seem to be differences between different hybrid cooperatives as the members lean towards a different cooperative commitment. The importance of the cooperative commitment depends on the internal structure of the cooperative.

Although it is unclear whether the findings concerning differences between members of traditional and hybrid cooperatives are only related to the cooperative business models or to the business logics of farmers in different agricultural industries as well, this study contributes significantly to knowledge about farmers' views of cooperatives. This study is also the first to explore how farmers' views of cooperatives have changed over time and to compare members of cooperatives with different organizational models. However, the extent to which the findings from the Finnish agricultural cooperative sector can be transferred to other situations remains unclear. Further studies of farmers' relations with their cooperatives will tell, especially their relations with hybrid cooperatives.

This study exhibits a pattern that is in line with recent research about farmers' views of their cooperatives as well as theoretical treatments of this subject. The structural development towards fewer and larger farms implies that farmers are increasingly dependent upon their cooperatives. This dependence fosters higher commitment to the cooperatives' business operations, though not as much to the social life within the cooperative societies. In this sense, this study may have a widespread applicability, although it is not possible to claim that the specific findings hold true outside the Finnish context.

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CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ETHIC STATEMENT

Not applicable

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REFERENCES

Ajates, R. (2019). Agricultural cooperatives remaining competitive in a globalised food system: At what cost to members, the cooperative movement and food sustainability? *Organization*, *27*(2), 337–355.

Ajates, R. (2020). An integrated conceptual framework for the study of agricultural cooperatives: From repolitisation to cooperative sustainability. *Journal of Rural Studies*, *78*, 467–479.

Alho, E. (2015). Farmers' self-reported value of cooperative membership: Evidence from heterogeneous business and organization structure. *Agricultural and Food Economics*, *3*, 23, https://doi.org/10.1186/s40100-015-0041-6

Apparao, D., Garnevska, E., & Shadbolt, N. (2019). Examining commitment, heterogeneity and social capital within the membership base of agricultural co-operatives—A conceptual framework. *Journal of Co-operative Organization and Management*, *7*(1), 42–50.

Barraud-Didier, V., Henninger, M.-C., & El Akremi, A. (2012). The relationship between members' trust and participation in the governance of cooperatives: The role of organizational commitment. *International Food and Agribusiness Management Review*, *15*(1), 1–24.

Bhuyan, S. (2007). The people factor in cooperatives: An analysis of members' attitudes and behavior. *Canadian Journal of Agricultural Economics*, *55*(3), 275–298.

Bijman, J. (2010). Agricultural cooperatives and market orientation: A challenging combination? In A. Lindgreen, M. K. Hingley, D. Harness, & P. Custanc, (Eds.), *Market orientation: Transforming food and agribusiness around the customer* (pp. 119–136). Aldershot: Gower Publishing.

Borgen, S. O. (2001). Identification as a trust-generating mechanism in cooperatives. *Annals of Public and Cooperative Economics*, *72*(2), 209–228.

Borgström, M. (2013). Effective co-operative governance: A practitioner's perspective. *Journal of Co-operative Organization and Management*, *1*, 49–50.

Chaddad, F. R., & Cook, M. L. (2004). Understanding new cooperative models: An ownership–control rights typology. *Review of Agricultural Economics*, *26*(3), 348–360.

Cook, M. L. (1995). The future of U.S. agricultural cooperatives. *American Journal of Agricultural Research*, *77*, 1153–1159.

Dunn, J. R. (1988). Basic cooperative principles and their relationship to selected practices. *Journal of Agricultural Cooperatives*, *3*, 83–93.

Emery, S. B. (2015). Independence and individualism: Conflated in farmer cooperation? *Agriculture and Human Values*, *32*, 47–61.

Feng, L., Friis, A., & Nilsson, J. (2016). Social capital among members in grain marketing cooperatives of different sizes. *Agribusiness*, *32*(1), 113–126.

Ferreira, M., Macagnan, C., Vancin, D., & Toaldo, A. (2021). Technical assistance: A determinant of cooperative member loyalty. *Annals of Public and Cooperative Economics*, *92*(4), 649–668.

Franken, J., Cook, M. L., & Pennings, J. (2022). Producer Risk Aversion and Participation in Agricultural Cooperatives. *Journal of Co-operative Organization and Management*, *10*(2), 100171. https://doi.org/10.1016/j.jcom.2022.100171

Franken, J., & Grashuis, J. (2023). New generation cooperatives: What we know and need to learn. In M. Elliott, & M. Boland (Eds.), *Handbook of research on cooperatives and mutuals* (pp. 83–99). Cheltenham: Edward Elgar. ISBN: 978 1 80220 260 1 .

Franken, J. R., Cook, M. L., & Pennings, J. M. (2022). Producer risk aversion and participation in agricultural cooperatives. *Journal of Co-operative Organization and Management*, *10*(2), 100171.

Fulton, M., & Giannakas, K. (2013). The future of agricultural cooperatives. *Annual Review of Resource Economics*, *5*(1), 61–91.

Grashuis, J. (2018). An exploratory study of ownership and governance interrelationships in traditional and hybrid farmer cooperatives. *Managerial and Decision Economics*, *39*(6), 664–673.

Grashuis, J., & Cook, M. L. (2017). Toward an updated typology of US farmer cooperatives: Survey evidence of recent hybrid ownership restructuring. In G. Hendrikse, G. Cliquet, T. Ehrmann, & J. Windsperger (Eds.), *Management and governance of networks. Contributions to management science*. Springer.

Grashuis, J., & Su, Y. (2019). A review of the empirical literature on farmer cooperatives, performance, ownership and governance, finance, and member attitude. *Annals of Public and Cooperative Economics*, *90*(1), 77–102.

Greene, W. H. (2003). *Econometric analysis*. Prentice-Hall, Upper Saddle River, NJ.

Greene, W. H., & Hensher, D. A. (2010). *Modelling ordered choices. A primer*. Cambridge University Press.

Hakelius, K., & Hansson, H. (2016a). Members' attitudes towards cooperatives and their perception of agency problems. *International Food and Agribusiness Management Review*, *19*(4), 23–36.

Hakelius, K., & Hansson, H. (2016b). Measuring Changes in Farmers' Attitudes to Agricultural Cooperatives: Evidence from Swedish Agriculture 1993–2013. *Agribusiness*, *32*(4), 531–546.

Hansen, M. H., Morrow Jr, J. L., & Batista, J. C. (2002). The impact of trust on cooperative membership retention, performance, and satisfaction: An exploratory study. *International Food and Agribusiness Management Review*, *5*(1), 41–59.

Hansmann, H. (1996). *The ownership of enterprise*. Cambridge, MA: The Belknap Press.

Hess, S., Lind, L. W., & Liang, S. (2013). Farmers' perceived transaction costs in relation to slaughterhouses of different ownership structure. *Agribusiness*, *29*(1), 96–111.

Hogeland, J. A. (2015). Managing uncertainty and expectations: The strategic response of U.S. agricultural cooperatives to agricultural industrialization. *Journal of Co-operative Organization and Management*, *3*, 60–71.

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

Iliopoulos, C., & Valentinov, V. (2018). Cooperative longevity: Why are so many cooperatives so successful? *Sustainability*, *10*(10), 3449.

James, Jr., H. S., & Sykuta, M. E. (2006). Farmer trust in producer- and investor-owned firms: Evidence from Missouri corn and soybean producers. *Agribusiness*, *22*(1), 135–153.

Kopka, C. J. (2023). Cooperative business structures: Access to capital via equity and credit. In *Handbook of research on cooperatives and mutuals* (pp. 100–114). Edward Elgar.

Kyriakopoulos, K., Meulenberg, M., & Nilsson, J. (2004). The impact of cooperative structure and firm culture on market orientation and performance. *Agribusiness*, *20*(4), 379–396.

Ménard, C. (2018). Organization and governance in the agrifood sector: How can we capture their variety? *Agribusiness*, *34*(1), 142–169.

Morfi, C., Nilsson, J., Hakelius, K., & Karantininis, K. (2021). Social networks and member participation in cooperative governance. *Agribusiness*, *37*(2), 264–285. doi/epdf/10.1002/agr.21660

Morfi, C., Ollila, P., Nilsson, J., Feng, L., & Karantininis, K. (2015). Motivation behind members' loyalty to agricultural cooperatives. In J. Windsperger, G. Cliquet, T.h. Ehrmann, & G. Hendrikse (Eds.), *Interfirm networks—franchising, cooperatives and strategic alliances* (pp. 173–190). Heidelberg: Springer.

Nilsson, J. (2008). Governance costs and the problems of large traditional co-operatives. *Outlook on Agriculture*, *47*(2), 87–92. https://doi.org/10.1177/0030727018761175

Nilsson, J. (2023). Social capital and governance of agricultural cooperatives. In M. Elliott & M. Boland (Eds.), *Handbook of research on cooperatives and mutuals* (pp. 116–134). Edward Elgar. ISBN: 978 1 80220 260 1 .

Nilsson, J., Kihlén, A., & Norell, L. (2009). Are traditional cooperatives an endangered species? About shrinking satisfasction, involvement and trust. *International Food and Agribusiness Management Review*, *12*(4), 103–123.

Nilsson, J., Liljenstolpe, C., Lind, L. W., & Liang, S. (2014). A farmer-controlled business from a farmer perspective. *Journal of Chain and Network Science*, *14*(3), 201–211.

Nilsson, J., Svendsen, G. L. H., & Svendsen, G. T. (2012). Are large and complex agricultural cooperatives losing their social capital? *Agribusiness*, *28*(2), 187–204.

Ollila, P. (2015). Tuottajaosuuskuntien kilpailuedut ja kehittymisen ongelmat taloustieteiden näkökulmasta. In S. Tenaw, V. Heinonen, P. Ollila, & S. Karhu (Eds.), *Osuuskunnat ja kestävä kehitys* (pp. 62–91). Pellervo Society and University of Helsinki.

Ollila, P., Nilsson, J., & Hess, S. (2014). Farmers' reactions to the internationalisation of cooperatives. *Agricultural and Food Science*, *23*, 291–306.

Ollila, P., & Pyykkönen, P. (2012). *Support for farmers' cooperatives*. Case study report; Cooperative dairy processor Valio—structural development to its present stage. Wageningen: Wageningen UR.

Österberg, P., & Nilsson, J. (2009). Members' perception of their participation in the governance of cooperatives: The key to trust and commitment in agricultural cooperatives. *Agribusiness*, *25*(2), 181–197.

Pellervo Confederation of Finnish Cooperatives. (2000). Corporate governance and management control in cooperatives. Helsinki: Pellervo Confederation of Finnish Cooperatives.

Pyykkönen, P., Bäckman, S., Kauriinoja, H., & Ollila, P. (2012). *Support for farmers' cooperatives; Country report Finland*. Wageningen: Wageningen UR.

StataCorp LLC. (2019).

Van der Krogt, D., Nilsson, J., & Høst, V. (2007). The impact of cooperatives' risk aversion and equity capital constraints on their inter-firm consolidation and collaboration strategies—with an empirical study of the European dairy industry. *Agribusiness*, *23*(4), 452–472.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. The MIT Press.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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