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Analysis of the Factors of Farmers' Participation in the Management of Cooperatives in Finland¹

LIU YU XIANG² AND JOHN SUMELIUS³

Abstract

Management of farmer-owned cooperatives cannot be successful without the participation of the members. If the managers of a cooperative are ignorant of the members' opinion, the whole organization could collapse. This study takes a people-centered perspective and, instead of focusing on the system and economic factors, makes a detailed analysis of the factors that determine the participation of the members in the management of their cooperative. Study data were obtained from a questionnaire completed by 200 members of a Finnish dairy cooperative. The factors analyzed represent the degree to which the members are committed to the management of their cooperative. The evaluation of institutional efficiency by the members and the education received by the members are also factors that affect members' participation. The attitude and opinions of the members can influence their conduct and willingness to participate. These can also affect the enthusiasm and commitment of members.

Keywords: cooperative management, members, motivation, willingness, behavior, management, organizational form, dairy cooperative

- 1 The authors would like to thank the 200 dairy farmers who completed the questionnaire used in this study, Valio Ltd., and in particular Veli-Matti Riitamaa, for the help with data collection, the Pellervo Confederation of Finnish Cooperatives, and Shimelles Tenaw. Useful comments of an anonymous referee are gratefully acknowledged.
- 2 Department of Travel and Exhibition Management, Henan University of Finance and Economic, Department of Travel and Exhibition Management, Zhengzhou city, Henan province, China
- 3 Professor, University of Helsinki, Department of Economics and Management, Finland. Corresponding author (John.Sumelius@helsinki.fi).

Introduction

A cooperative offers a different organizational form than the investor-oriented firms or the joint-stock companies (corporations), which are prevalent in the agricultural and food sector. A joint-stock company is owned by its shareholders, whose voting rights are proportional to the number of shares a shareholder possesses, whereas a cooperative is owned by its members, each of whom have only one vote. The voting rules and the property rights structure of cooperatives are distinctive for their management approaches, such as “one man, one vote” democratic management. There are many similarities between the management of joint-stock companies and cooperatives, but the two are fundamentally different. For this reason many researchers have compared the two organizational forms of enterprise management in order to find the strengths and weaknesses of both models.

Previous studies have used various theories in cooperative management research in order to make useful suggestions on how to improve the efficiency of cooperative management. Most researchers who are critical use arguments of property rights theory and principal-agent theory. Fuzzy property rights, management inefficiencies, and high agency costs are primary problems that have been highlighted in these studies (Porter and Scully 1987; Vitaliano 1983, Hackman and Cook 1997). Cook (1994, 1995) distinguishes three investment-related efficiency problems in farmer-owned cooperatives: the free rider problem, the horizon problem, and the portfolio problem. Eilers and Hanf (1999) address the issue of the optimum contract design in agricultural cooperatives that utilize principal-agent theory. The authors provide an enlightening discussion of a major question regarding cooperative control and organizational design: Who is the principal and who is the agent in an agricultural marketing cooperative? The paper explores and offers solutions in situations where the manager, acting as an agent or principal, offers a contract to a farmer, and where the farmer, acting as an agent or principal, offers a contract to the cooperative. Positing a strong utility function and risk preference assumptions, their results generated interesting hypotheses regarding, which actor benefits most in which position and the implications of alternative incentive terms.

The Finnish Pellervo Economic Research Institute (2000) made the following recommendations for a system of good corporate governance practice, which are equally applicable irrespective of whether a cooperative is large or small:

1. There should be an increase in annual reporting and similar disclosures, especially in respect to profits and their distribution.
2. More information concerning the tasks of board members should be disseminated. Moreover, the efficient working of both the board of directors and

the supervisory board should be promoted through training and developing self-evaluation.

3. Management control systems should be developed and presented (control comprises both financial performance and goal monitoring).

4. The same performance and goal monitoring as in 3 should be done for remuneration schemes.

Finnish cooperative experiences emphasize professional management and systems that provide more profit to members. These factors are essential to the operation of a cooperative.

The concept of “one man, one vote” has received much criticism, especially from the perspective of transaction cost theory (e.g., Hendrikse and Veerman 2001). Many older cooperatives have many thousands of members, so the rule of “one man, one vote” is claimed to be inefficient and linked to high costs. As a consequence, many cooperatives in North America have changed or abandoned this rule (ShiQiong 2007). On the other hand, the rule of “one man, one vote” is necessary not only to maintain democracy in a cooperative and the loyalty of its members, but also to reveal the will of the majority of the members. New communication technology could reduce the cost of voting, and good decisions made by the members could counteract the high cost.

Many earlier studies on cooperatives focused their research on the system and on economic factors. These studies covered the following topics: theoretical discussions, demonstrative descriptions of the characteristics and the development of cooperatives, the property rights system, management structures, the conditions of the cooperative systems, government policies, and models of cooperatives. The implementation of all of these factors has been urged for the development of cooperatives. However, research on the subject of cooperatives and their members has been neglected. A cooperative cannot exist without the participation of its members. Consequently, it is necessary to study cooperatives from a farmer-center perspective.

Some scholars have begun to notice the significance of members and have drawn some useful conclusions. Bhuyan (2007) examined the role of these “people” factors in a sample of fruit and vegetable growers’ cooperatives in the Mid-Atlantic United States. Although the Theory of Planned Behavior is used as the framework of analysis, the study’s findings provide additional insights into how the beliefs and knowledge of members of a cooperative may shape their attitudes and consequent behavior. Hakelius (1999) found that young and old farmers view their cooperative commitments differently. Young farmers generally see their commitments to a cooperative as a means of obtaining an economic advantage. Older farmers view their commitment as a way of achieving solidarity with their peers, with the economic aspect being of secondary importance.

Members are the basis of and provide crucial resources for cooperatives as they own and use the cooperative and supply it with raw materials and capital. Cooperative management cannot be successful without the participation of its owners, the farmers, as their needs and attitudes play such a significant role. However, one of the major problems confronting all organizations that involve membership such as cooperatives and unions is the apathy of members toward their organizations and their respective organizational activities (Bhuyan 2007). The future of an organization whose owners and users do not care about management may develop as follows. As the cooperative grows and employs more professional managers, many members feel that they cannot control their organization as before. Consequently, voluntary team spirit and the sense of belonging decrease, especially when managers and members do not communicate enough with each other. If the members of a cooperative are dissatisfied, then negative feelings and behavior develop, which influence the normal operations of the cooperative and may even cause its dissolution. For example, Goodman (1994) described a case in a rural electric cooperative in Pennsylvania in which the members took action and replaced the managers of the cooperative because of poor management of the latter. Moreover, a case study reported by Jesse and Rogers (2006) of the Ocean Spray cooperative involved in cranberry processing reveals how the mistakes made by its management led to a crisis of confidence within its membership, substantial financial loss for its members, and member dissatisfaction. Further, Cook (1994) states that cooperative leaders should be aware of the importance of participation and commitment of its members, understand the unique nature of their role in order to help them use their own management skills and leadership effectively to foster the success of the cooperative business (Cook 1994, Bhuyan and Leistritz 2001). Hendrikse (2004) describes a case of the grower–management relationship in which both the geographical and the psychological distance between the growers and management increased after a merger due to the arrogance of the managers of a cooperative. In its early years, the management of The Greenery VoedingsTuinbouw Nederland (VTN), mostly recruited from outside the agrifood sector, used a top-down method of communicating to its growers. The growers were told that the marketing of their products was now the sole responsibility of The Greenery management and that they were mere suppliers. Discontent among the growers led to a sharp reduction in the number of members of the cooperative. In 1996 VTN started with approximately 10,000 members. At the end of 2000 VTN had about 4,000 member firms.

Earlier studies provide useful suggestions for cooperative management from the point of economic and system factors of the whole cooperative system. However, studies of management from the perspective of members are scarce, and this is the focus of this paper. Therefore the aims of this study were to describe how members

take part in cooperative management and which factors influence the members decision-making and participatory behavior in the management of their cooperative. We will also make some recommendations about the best ways cooperative managers can enhance members' will and actual behavior related to participation in cooperative management. Some suggestions for developing countries will be provided.

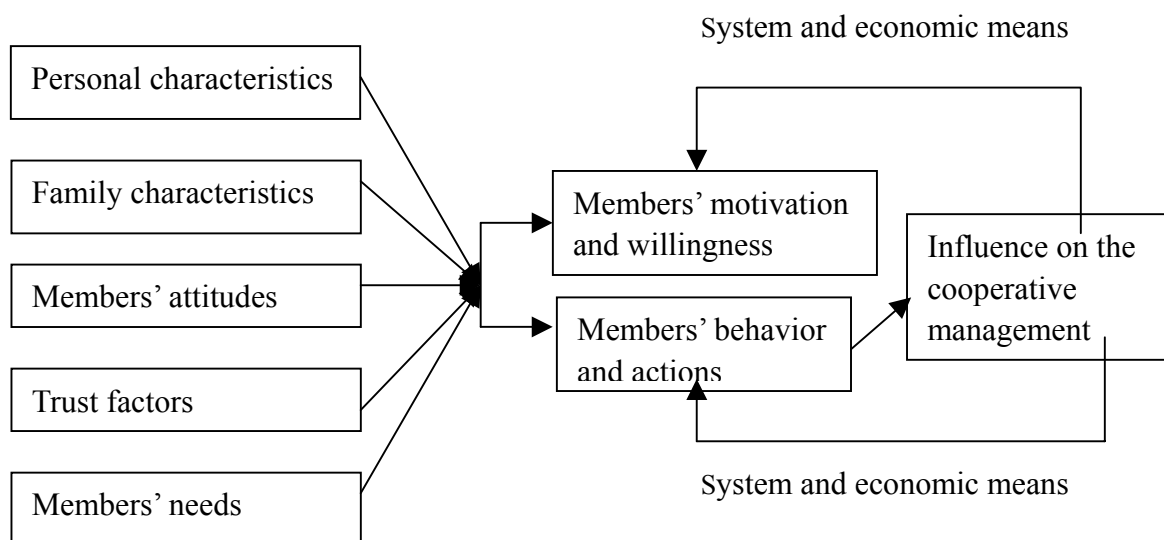
Analyzing members' willingness to participate and actual participation in cooperative management

This study investigates what factors influence the members' motivation and participatory behavior in the management of cooperatives. It is necessary to consider internal psychological factors, including the members' attitudes and needs towards their own cooperative. External economic factors, such as age, sex, income, education etc., were also considered. The Theory of Planned Behavior (TPB) is a popular theory in the analysis of human behavior. TBP theory examines the link between attitudes and behavior, and postulates that attitude is one of the principal factors determining intentions and behavior (Ajzen 1988, 1991). The attitude of members toward their own cooperative is generally based on their knowledge, beliefs, and perceptions about their cooperative. These, in turn, influence the degree of importance that they assign to their cooperative (Bhuyan 2007). The present study does not directly use TPB, although it is generally accepted that one's attitudes and motivation do influence one's behavior (Peter and Olson 2004; Ajzen and Fishbein 2004; Bhuyan 2007). In this study we assume that cooperative members are the owners and users, thus their motivation and behavior plays a crucial role in cooperative management. The path of analysis for this paper, which has been designed by the authors, is shown in Figure 1.

According to Figure 1, there are five groups of factors, external and internal, that affect members' motivation and decision-making behavior. These groups are personal characteristics, family characteristics, attitudes, trust factors, and needs of members. The different factors of the five groups are presented in the Methods section and in Table 2 in the Data section. Motivation and decision-making behavior are influenced by these factors, and motivation has a crucial influence on members' behavior. However, in order to transform motivation into action, some external conditions may have to be met. Although the members' motivation/willingness is not the same as behavior, a priori it would be expected to influence strongly the management and thus the future of the cooperative. When the members make a decision, which depends on their motivation (willingness) and external conditions, it will influence the cooperative management. Thus, leaders of

cooperatives should use a system of economic incentives to motivate and guide their members so as to act in a way that is good for the cooperative. Such change would also reduce negative actions. The leaders should communicate with the members and learn their needs, and then improve the system or change the way of distributing economic benefits and incentives. In short, cooperative leaders should reduce their members' levels of dissatisfaction and encourage them to support their respective cooperatives.

Figure 1: Path analysis of members' participation in cooperative management



In the empirical part we study three types of conscious decisions by the respondents, which reveal their *motivation and willingness*, namely: leaving the cooperative, not fulfilling their obligations (such as not supplying milk to the cooperative dairy), or actively taking part in the management of the cooperative. We correspondingly examine three forms of *behavior and actions*, namely: attending meetings, voting, and communicating with the leaders of the cooperative. The aim is to establish which motivating factors explain the behavior and which explain the decision-making of cooperative members.

Methods

Our goal was to determine what factors influence members' motivation and behavior related to members' active participation in the management of cooperatives. First, we define empirical measures for members' motivation and for their behavior and actions. These are presented in Table 1.

Table 1: Measures of cooperative members' motivation and behavior

Members' motivation/willingness	Members' behavior/actions
1. Having considered leaving the cooperative (yes/no)	4. Taking part in meetings of the cooperative (scale 1-7)
2. Having considered not fulfilling their obligations as a member (yes/no)	5. Frequency of voting (scale 1-7)
3. Having considered taking part in cooperative management (yes/no)	6. Communication with cooperative leaders (scale 1-7)

We stated earlier that five groups of factors may influence the members' motivation/willingness and behavior, according to Figure 1. The first group, "personal characteristics", includes age, gender, educational background, income, and level of debt, among other variables. The second group, "family characteristics", includes the number of family members, the number of cows, land hectareage, and so on. The third group, "members' attitudes", covers their opinions about the cooperative, such as the cooperative's competitiveness, the efficiency of management, the degree of solidarity between members, and the degree of equality inside the cooperative. The fourth group, "trust factors", includes the level of trust between members, the trust between members and leaders, and the trust in society in general. The fifth group concerns the "members' needs": these factors include what members want the cooperative to improve, such as the level of profit, democracy, and training. The empirical data on the variables are presented in the Data section of this article.

Therefore, in the empirical analysis we first analyzed the respondents' behavior and then their motivation and decision making using the SPSS13 software. The variables that measure the behavior and actions of the respondents are polychotomous, measured on a scale of 1-7. In contrast, the variables that measure members' motivation/willingness are dichotomous, categorized as either 1 or 0. We analyzed these dependent variables through a) a linear probability model and b) a logit model (Wooldridge, 2006). We used multivariate linear regression and least squares estimation to estimate a linear probability model (1) to analyze respondents' behavior. The basic linear probability model is

$$(1) \quad Y_i = \beta_0 + \sum \beta_{ij}X_{ij} + \varepsilon_i$$

where Y_i = behavior related to participation in the management of the cooperative (meeting, voting, communicating with leaders)
 X_{ij} = attitudes, personal characteristics, family characteristics, trust factors, the respondents' needs.

Here $\Delta P(Y = I) = \beta_j \Delta X_j$. This multivariate linear regression model assumes that behavior depends on a vector of independent variables (X_{ij}) associated with the respondent i and variable j , and also a vector of unknown parameters β_j . We suppose $b_0, b_1, b_2, b_3, b_4, b_5, \dots, b_m$ have the least square estimate of $\beta_1, \beta_2, \beta_3, \dots, \beta_m$, thus

$$(2) \quad Y_k = b_0 + b_1X_{k1} + b_2X_{k2} + \dots + b_mX_{km} + e_k (k = 1, 2, \dots, n).$$

In addition, we use a multinomial logit model (3) to analyze the motivation and willingness of respondents:

$$(3) \quad \text{logit}P_i = a + \beta_1X_1 + \dots + \beta_mX_m,$$

where

$$(4) \quad P_i = \frac{I}{1 + \exp(\alpha + \beta_1X_1 + \dots + \beta_mX_m)}$$

The logit model assumes motivation of an individual respondent depends on a vector of independent variables (X_{ij}) associated with respondent i and variable j , and a vector of unknown parameters β_m . We have estimated the logit models in equations (3) and (4) by maximum likelihood.

We used two different probability models because it is well known that the linear probability model in equation (1) and (2) has a number of features that may lead to certain problems. Studenmund (1992:512-513) mentions a non-normally distributed and heteroscedastic error as one problem. He notes that R^2 is not an accurate measure of the fit of the model. Finally, P_i is not restricted to between 0 and 1. The heteroscedasticity problem may be overcome by the use of weighted least squares and the P_i can be restricted so that $0 \leq P_i \leq 1$. On the other hand, in the logit model in equations (3) and (4) P_i is restricted to between 0 and 1. For the logit model there is also an alternative measure to R^2 that may be used, R_p^2 , a pseudo R^2 measure proposed by Nagelkerke. R_p^2 is also called the Nagelkerke R^2 to distinguish it from other pseudo R^2 measures. The Nagelkerke R^2 is

(5)
$$R_p^2 = 1 - \exp \left[-\frac{2}{n} \left\{ l(\hat{\beta}) - l(0) \right\} \right] = 1 - \left\{ L(0) / L(\hat{\beta}) \right\}^{2/n},$$
 where $l(\hat{\beta}) = \log L(\hat{\beta})$ and $l(0) = \log L(0)$ denote the likelihoods of the fitted model and the likelihood of the model with only the intercept (the “null” model) (Nagelkerke, 1991).

Our use of two different models in this study is simply motivated by practical empirical reasons. The linear probability model seems to yield more econometrically plausible results that explain the behavior of respondents: these are the variables in the right column of Table 1. The logit model yields econometrically more plausible results that explain the motivation of the members: these are the variables in the left column of Table 1.

Data

The data of this paper were obtained via a questionnaire distributed to the members of Finnish Valio cooperative. Founded in 1905, the Finnish Valio group has more than a century of history of cooperative organization. It has more than 10,000 members and controls over 90 percent of the dairy market in Finland. Valio is owned by 22 dairy cooperatives that collect or process milk; these in turn involve communities that total 10,900 Finnish milk producers. It has a successful form of organization for professional management and good communication with its members. This study was assisted by Valio. Before we sent out the questionnaires, the Valio leader contacted the local cooperatives in order to explain the aims of the study and to persuade Valio’s members to complete the questionnaires. It was explained that the aim of the survey was to find out the opinions of the members about the cooperative and which factors affect the members’ motivation and behavior related to their active participation in the cooperative. With the help of Valio questionnaires were sent out to a total of 500 members and 200 completed questionnaires were eventually received. This rate of response, 40 percent, is considered satisfactory because the questionnaire was sent in May, a busy month for the dairy cooperative members.

The specific variables for which data were collected are listed in Table 2. Although normally difficult to collect, we received data on income, debt, assets, and land of the respondents. This was probably because of their trust in their own cooperative and also their good communication with the cooperative’s council.

Multicollinearity between explanatory variables X_{ij} with does not appear to be a problem by tests using the correlation matrix, tolerance, and eigenvalue.⁴

Table 2: Variable definitions

Dependent Variable		Value*
Y ₁ B	Meeting (the frequency of attending meetings)	1-7
Y ₂ B	Vote (the frequency of voting)	1-7
Y ₃ B	Communication (the frequency of communicating with leaders)	1-7
Y ₄ W	Quit (the will to leave)	0-1
Y ₅ W	Duty (not fulfilling the obligations of members)	0-1
Y ₆ W	Management (the will to participate in cooperative management)	0-1
Independent variables		
Personal characteristics		
X ₁	Age	Years
X ₂	Gender	1(male) 0(female)
X ₃	Education*	1-6
X ₄	Personal monthly income	Euro
X ₅	How long have you been engaged in agriculture	Years
X ₆	How long have you been a member	Years
Family characteristics		
X ₇	How many cows do you have	Number
X ₈	Number of family members	Number
X ₉	Proportion of total agricultural production sold	%
X ₁₀	Annual income as a farmer	Number
X ₁₁	Debt	Euro
X ₁₂	Profit (2007)	Euro
X ₁₃	Family assets for agricultural production	Euro
X ₁₄	Farm scale	Hectare
X ₁₅	Other income	1(yes) 0(no)
X ₁₆	Proportion of agricultural income in total annual income	%

4 Only a few correlation coefficients of the variables exceeded a value higher than 0.8 (Studenmund 1992: 273), so the degree of multicollinearity between explanatory variables X_{ij} does not seem to be very high. The condition number was less than 30, so the phenomenon of multicollinearity between explanatory variables X_{ij} is not a problem (Kmenta 1986: 439).

X ₁₇	Proportion of total agricultural production sold to cooperative	%
Members' attitudes**		
X ₁₈	cooperative's role in improving your income	1-7
X ₁₉	cooperative's competitive capability	1-7
X ₂₀	degree of solidarity in the cooperative	1-7
X ₂₁	degree of heterogeneity of members in the cooperative	1-7
X ₂₂	degree of feeling of belonging to the cooperative	1-7
X ₂₃	degree of equality in the cooperative	1-7
Trust factors**		
X ₂₄	degree of trust between the members	1-7
X ₂₅	degree of trust in the manager	1-7
X ₂₆	degree of trust in society in general	1-7
X ₂₇	degree of trust in the cooperative	1-7
Members needs (What is your greatest concern about cooperative management?)**		
X ₂₈	Price of milk	1-7
X ₂₉	Production services	1-7
X ₃₀	Cooperative investments	1-7
X ₃₁	Degree of democracy	1-7
X ₃₂	Profit	1-7
X ₃₃	Cooperative expansion	1-7
X ₃₄	Election of leaders	1-7
X ₃₅	Training of members	1-7
X ₃₆	Efficiency of management	1-7
Channels for the sale of production***		
X ₃₇	Cooperative	1-3
X ₃₈	Retailer	1-3
X ₃₉	Other farmers	1-3
X ₄₀	Direct sales	1-3
Channels for loans***		
X ₄₁	Cooperative bank	1-3
X ₄₂	Commercial bank	1-3
X ₄₃	Insurance company	1-3

* Education is measured on a scale of 1-6: 1=elementary school, 2=middle school, 3=high school, 4=college, 5=university (Bachelor's degree), 6=Master's degree or higher.

** For variables measured on a scale of 1-7, 1 is the lowest degree and 7 is the maximum degree.

*** For variables measured on a scale of 1-3, 1=least important, 2=average importance, 3=most important.

These data collected by the survey included external economic factors and respondents personal opinions and needs. Table 3 presents the basic information about the respondents. In terms of age distribution, 11.1 percent of the respondents were under 30 years old, 75.2 percent were 30-50 years old, and the average age was 44.1 years. The average land area was 92.3 hectares, the mean monthly income was 5,536 euro, the mean proportion of agricultural income in total income was 87.6 percent, and 59.5 percent of the respondents had non-agricultural income sources.

Analysis of the results

In Tables 4-9 the results of equations (1)-(4) are presented. These equations explain the motivation and the behavior of respondents. The results of the linear probability models (1) and (2) describing the behavior/actions of the members are shown in Tables 4-6. The results obtained from the logit models (3) and (4), which explain the motivation and willingness of the respondents, are shown in Tables 7-9.⁵

Table 3: Some descriptive statistics

Variable	Unit	n	min	Max	Mean	Standard deviation
Frequency of attending meetings	1-7	190	1	7	3.0	1.88
Age	Years	190	23	64	44.1	9.36
Monthly income	Euro	190	0	150000	5537	13564
Land scale, including rented land	ha	190	23	709	92.3	72.1
Non-agricultural income	% of respondents	190	0	1	59.5%	49.2%
Proportion of agricultural income	% of total income	190	5%	100%	87.6%	0.17

Table 4 shows that five factors influence the frequency of attending meetings. These factors positively correlate with the frequency of attending meetings, which

5 We calculated the contribution of every independent variable to the dependent variable and chose the most significant for the equations. Then we re-estimated the contribution of every independent variable and inspected whether each new, included variable was statistically significant.

suggests that if the respondents trust the management of the cooperative and that the degree of trust is high, then their frequency of taking part in meetings will correspondingly be higher. The implication is that the factor that reduces trust, e.g. a more distant relationship with the management, will reduce the probability of members taking part in meetings. Another factor that influences the frequency of attendance of meetings is the competitive capability of the cooperative. If members think that their cooperative is highly competitive and if they sell their produce through the cooperative more than any other outlet, they will be more active in attending meetings. Older members and members with more debt are more eager to attend meetings.

Table 4: The factors that influence the frequency of attending meetings (Y_1 BMeeting)

X_i	Y_i	β	t-statistic	P-value
Constant		-4.539	-4.348	< 0.001
X_1	Age	0.034	3.187	0.002
X_{11}	Debt	< 0.00	2.664	0.009
X_{19}	Cooperative's competitive capability	0.116	2.222	0.028
X_{25}	Degree of trust in the manager	0.701	12.934	< 0.001
X_{37}	Sale through cooperative	1.033	3.475	0.001
		$R^2=0.613$		

Table 5 shows the factors that influence the frequency of voting by respondents. Eleven factors influence voting behavior. Again the trust factor was crucial to the actions and decisions taken by respondents. If the members trust the managers and other members, they will vote more actively. However, if their degree of trust in society in general is high (for example, believing that the law and government can solve their problems), they will vote on fewer occasions. This implies that the cooperative helps to compensate the limitations of society: "if you don't trust society, you can still trust the cooperative". The needs of the respondents also played a role in their voting behavior. Moreover, members who care more about factors such as training, cooperative investment, the efficiency of management, and the price of milk will tend to vote more regularly than those who care less. A good education was also associated with more voting activity. A high number of family members influenced the voting activity positively. An interesting observation regarding farm scale was that respondents who owned more arable land voted less. Although at -0.003 the coefficient is small it shows that an increase in farm scale might be expected to decrease the members frequency of voting behavior.

Interestingly, the p -value of the price of milk variable was 0.09 and was not significant. Farmers that cultivate more land tend to be engaged in other production lines in addition to milk production, which suggests that they have less time to be involved in cooperative management. If respondents think the degree of equality is high in the cooperative, they will be more active voters than if they consider the degree of equality to be low. Therefore, it is important to provide good conditions to sustain equality for members to active participation in cooperative management.

Table 5: The factors that influence the frequency of voting (Y_2BVote)

X_i	Y_i	β	t-statistics	P-value
Constant		-5.638	-4.163	< 0.001
X_3	Education	0.195	2.311	0.022
X_8	Number of family members	0.167	2.502	0.013
X_{14}	Farm scale	-0.003	-2.334	0.021
X_{23}	Degree of perceived equality in the cooperative	0.366	3.597	< 0.001
X_{24}	Degree of trust between the members	0.255	2.416	0.017
X_{25}	Degree of trust in the manager	0.216	3.526	0.001
X_{26}	Degree of trust in society in general	-0.374	-2.919	0.004
X_{28}	Price of milk	0.316	1.702	0.091
X_{30}	Cooperative investments	0.549	10.547	< 0.001
X_{35}	Training of members	0.272	3.042	0.003
X_{36}	Efficiency of management	0.145	2.407	0.017
		$R^2=0.630$		

Table 6 shows the factors that influence the frequency of the respondents communication with the managers of the cooperatives. The degree of trust in the manager plays the same role as communication; thus a cooperative's manager should build favorable and authoritative persona as this would be expected to help to improve the communication with the members. The respondents appraisal of the competitiveness of the cooperative and the degree of equality by which it is run also positively influenced their willingness to communicate with the manager. If a member sells milk to other farmers, he/she is likely to communicate with the managers. Members whose proportion of agricultural income of the total annual income is high tend to communicate less with the cooperative leaders. This suggests that members whose proportion of non-agricultural income is great are likely to communicate more with cooperative managers.

Table 6: The factors that influence the frequency of communicating with leaders (Y₃BCommunication)

X_i	Y_i	β	t-statistics	P-value
X ₁₆	Proportion of agricultural income in total annual income	-1.304	-2.890	0.004
X ₁₉	Degree of cooperative's competitive capability	0.320	6.457	< 0.001
X ₂₃	Degree of equality in the cooperative	0.158	2.410	0.017
X ₂₅	Degree of trust in the manager	0.133	2.949	0.004
X ₃₆	Efficiency of management	0.301	5.986	< 0.001
X ₃₉	Sales channel: other farmers	0.257	2.675	0.008
		R ² =0.630		

Next we analyzed the motives and decision-making of members of cooperatives using the logit models (3) and (4). The results are presented in Tables 7, 8 and 9.

Table 7: The factors that influence the will to leave (Y₄WQuit)

X_i	Y_i	β	SE	P-value
Constant		-1.054	0.677	0.120
X ₈	Number of family members	-0.355	0.164	0.025
X ₂₀	Degree of solidarity in the cooperative	-0.070	0.061	0.047
Percentage correct 88%		-2logarithmic likelihood= 117.475		Nagelkerke R ² = 0.097

Tables 7, 8, and 9 present the results on the motivation and decision-making of the members. Table 7 shows the factors that influence the respondents' decision to leave, which implies that they would possibly sell their milk to another company. Although the pseudo R^2 statistics, the Nagelkerke R^2 , were not as high as the previously reported R^2 , the results are noteworthy. The explanatory variables the number of family members and the degree of solidarity with the cooperative were inversely associated with the respondents' intention to leave the cooperative. This suggests that if the number of family members is high, the motivation to leave will

be less than it would be if the number of family members were low. Moreover, the data suggested that if the respondents consider the degree of solidarity in their cooperative to be high, they will not consider leaving the cooperative. One may add that the dissatisfaction with the cooperative price of milk paid to the producer and advanced age seem to have affected the desire to leave, although these variables were not significant.

In the study questionnaire reasons for respondents to join the cooperative were sought. The most important reason seemed to be to obtain better marketing for the produce. Thus, out of all of the cooperative functions, a respondent will most appreciate the marketing and selling of milk.

Table 8 presents the explanatory variables that influence the farmers' decision not to fulfill the obligations to the cooperative. Adequate marketing services for the production of milk is one of the important factors that affect respondents' decision not to fulfill their obligations, e.g., not to supply milk to the cooperative dairy but sell it to another dairy instead. If a member is dissatisfied with the services, then it is more likely that the member would not to fulfill this obligation. Training of members and trust in society in general strengthen the sense of obligation members feel toward their own cooperative.

Table 8: The factors that influence the members' decision not to fulfill the obligations to the cooperative (Y_5 WDuty)

X_i	Y_i	β	SE	P-value
Constant		0.359	2.275	0.875
X_{26}	Degree of trust in society in general	-0.697	0.303	0.022
X_{29}	Production services	0.781	0.377	0.038
X_{35}	Training of members	-0.740	0.272	0.007
Percentage correct 93.4%		-2logarithmic likelihood= 76.784		Nagelkerke R^2 = 0.251

Finally, we found the factors that influence the respondents' desire to participate in cooperative management. As Table 9 shows, education can improve the respondents' intentions to participate in the management of the cooperative, which implies that educating a cooperative's members is a long-term process. Debt was also positively associated with the respondents desire to participate in the management of the cooperative. If a member cares about the election of the cooperative's leaders, then she will actively participate in the cooperative. Trust factors, especially trust in the manager, proved to be crucial again. Trust factors

should not be ignored at all in cooperatives. Some members do not want to participate in the management of a cooperative because they had obtained a loan from a commercial bank. As a consequence they may think that the cooperative was not a financial help to them.

Table 9: The factors that influence the will to participate in cooperative management (Y_6 WManagement)

X_i \ Y_i	β	SE	P-value
Constant	-9.542	1.926	< 0.001
X_3 education	0.549	0.232	= 0.018
X_{11} debt	0.000	0.000	=0.021
X_{25} the degree of trust in the manager	0.438	0.125	< 0.001
X_{34} the election of leaders	0.727	0.234	= 0.002
X_{42} loan from commercial bank	-0.566	0.297	= 0.056
Percentage correct 83.8%	-2logarithmic likelihood 126.907		Nagelkerke $R^2=0.380$

We conclude that of the 43 variables, 20 independent variables explain the dependent variables at a significance level of $\alpha = 0.05$ or less. Table 10 provides a summary of all these independent variables in column one and the corresponding dependent variables are in columns 2 to 6.

Half of the 20 significant independent variables explained more than one dependent variable and therefore seem to be more influential than the remaining variables. We briefly comment upon those 10 important independent variables. The single most important of these seems to be the degree of trust in the manager which influenced all categories of behavior to varying extents. These behaviors include the following: the frequency of attending meetings, the frequency of voting, and the frequency of communicating with leaders. These, in turn indicate that trust factors are crucial for improving the enthusiasm of members to actively participate in managing the cooperative. On the other hand, the personal charisma of a manager might also be an important factor for members' willingness to participate in the management of the cooperative. The respondents' perceptions of the cooperative's degree of competitiveness explained the frequency of respondents attending meetings and their frequency of communicating with leaders, which suggests that the respondents care about the future of their cooperative. A corollary of this is that leaders should communicate with the members and clarify their decision making. The respondents appraisal of the efficiency of management also has much the same role as the degree of equality in the cooperative. The degree of

Table 10: Summary of the significant explanatory variables

X_i	Y	Y ₁ BMeeting	Y ₂ BVote	Y ₃ BCommunica tion	Y ₄ WQuit	Y ₅ WDuty	Y ₆ Wmanage ment
X ₁	Age	√					
X ₃₁	Level of education		√				√
X ₈	Number of family members		√		√		
X ₁₁	Level of debt	√					√
X ₁₄	Farm scale (hectares)		√				
X ₁₆	Proportion of agricultural income in total annual income			√			
X ₁₉	Cooperative's competitive capability	√		√			
X ₂₀	Degree of solidarity in the cooperative				√		
X ₂₃	Degree of perceived equality in the cooperative		√	√			
X ₂₄	Degree of trust between the members		√				
X ₂₅	Degree of trust in the manager	√	√	√			√
X ₂₆	Degree of trust in society in general		√			√	
X ₂₉	Production services					√	
X ₃₀	Cooperative investments		√				
X ₃₄	Election of leaders						√
X ₃₅	Training of members		√			√	
X ₃₆	Efficiency of management		√	√			
X ₃₇	Sale through cooperative	√					
X ₃₉	Sale through other farmers			√			
X ₄₂	Loans from commercial bank						√

Note: The symbol “√” denotes that the variable X_i is significant at a level of $\alpha = 0.05$ or less.

trust in society in general explained voting frequency. This variable also explained the members having considered whether or not to fulfill their obligations. This finding is indicative that trust in the cooperative and trust in society are mutually interchangeable to some extent. A high level of trust in society may decrease the need to rely on cooperatives. Education explained voting frequency and the willingness to participate in cooperative management. This association suggests that a members level of education can be associated with an increase in his activity in her cooperative management, and also improve that members communication with leaders along with a greater understanding of management policy. The training of members is also a significant variable in two cases. First, it influences the frequency of voting by members and their willingness to fulfill their duties. Hence, the training of members is important and necessary. Second, the degree of equality in the cooperative shows that if a member thinks that she is equal to others in the cooperative, then she will vote more, and the frequency of communication with leaders will be higher. Of the family characteristics, the number of family members and level of debt explained more than one dependent variable. From this analysis we find that internal psychological factors play a more crucial role for members' participation than do external economic factors such as assets, income, or debt, and that members with other non-agricultural income are likely to communicate more with cooperative managers.

The weaknesses of this study are that the economic-man hypothesis is too simple and does not fit the real world and that there are no equal hypotheses on human nature with regard to cooperative members so far. The human nature of cooperative members motivation and behavior should be studied from the perspectives of sociology and psychology.

In previous studies on cooperatives, the research focus has mostly been on economic and system factors without considering the members themselves. Nevertheless, members are the basis of the cooperative as owners and users, and without their participation, the cooperative loses its original reason for being. This paper studied the members points of view about what factors influence their willingness and behavior to participate in the management. A cooperative will fail without the support of its members, and the cooperative's leaders therefore must know what its members think, specifically, why its members do not want to participate in management decisions. If members are dissatisfied, then it will be necessary to establish a new system to reduce dissatisfaction.

Conclusions

This study was based on data obtained from a sample of cooperative dairy farmers in Finland, from which we draw some conclusions. Equality and fairness in cooperatives can improve members' willingness and participatory behavior in cooperative management. Trust factors, especially trust in the cooperative and the managers' personal charisma, are also crucial to members. The members' education level affects their frequency of participation. Educated members more easily understand the cooperative management policies and also communicate more frequently with the management than their less educated peers. Thus, the training of members should be considered a long-term measure. Debt of individual members was also a factor in motivating members to participate in management. Attention should be paid to members whose proportion of agricultural income in their total annual income is higher, as their frequency of communication with the cooperative leaders paradoxically is less than for others. Psychological factors are more important than economic factors in motivating members to participate in management, although economic factors still have an irreplaceable role in cooperative development.

The results suggest that the management should pay sufficient attention to members' attitudes and needs. It is also important for developing countries to learn the management experiences of cooperatives in developed countries. First, it is better to choose a highly respected manager for a cooperative because trust plays a crucial role in members' participation in cooperative management activities. Second, professional management is necessary in order to generate more profits and retain more members. Third, more investment in the human capital resources of the cooperative and in the training of members and potential leaders is a requirement for sustainable development of a cooperative. Fourth, cooperative leaders should not ignore the opinions of its members and they should also maintain good contact with members. Good leaders should encourage members' participation in cooperative management.

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