The switching behaviour of Finnish co-operative members in relation to their commitment and loyalty

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Abstract

An important asset of co-operatives is the commitment and loyalty of their members. Farmers who do not switch from their co-operative to another trading partner can be assumed to be committed and loyal. Using the ZIP model, this study investigated Finnish farmer-members' switching behaviour with respect to five indicators of commitment and loyalty: satisfaction, promotion of own interests, readiness to exit, proneness to raise voice; and the co-operative's complaint handling. The main findings are: Some members complain little and never switch to another buyer. Members who are ready to switch to get the same benefits will most likely switch at least once. Members who are likely to switch will switch even if the management meets their requests. Younger farmers are more prone to switch, while older farmers are less.

Keywords: commitment, loyalty, member agricultural co-operatives

1. Introduction

The industrialisation of agricultural production and the competition from large multinational corporations have changed the conditions for agricultural co-operatives. They have responded by merging, even across national borders. Co-operatives are thereby increasingly facing portfolio issues. In particular, members may attempt to alter the co-operative's portfolio in order to advance their personal interests, which may threaten the success of the co-operative.

Key factors for the success of co-operatives are the members' commitment and loyalty to the cooperative, its management and other members. "Committed members are less likely to exit the cooperative, or to 'sell outside' when alternative buyers offer better prices or services" (Cechin et al., 2012a, 40). If members exit, the co-operative loses not only volume and revenues but also financial capital. Exiting of large and important farmers may result in a 'bank run', i.e., more and more members leave with detrimental consequences for members who have difficulties to find another trading partner.

Researchers of co-operatives examining why members exit often use the concept of satisfaction, which is related to commitment and loyalty (Österberg and Nilsson, 2009). Satisfied members have no motivation to exit the co-operative, whereas dissatisfied members' behaviour is complex. Dissatisfied members can raise their voice and complain over the co-operative, exit in order to send a signal, or remain silent (Hirschman, 1970). Furthermore, among farmers exiting the co-operative, there are some who later return. While much research has been done about farmers' choice of a co-operative trading partner, no previous study has focused on their 'hop on-hop off' behaviour. The present study seeks to clarify the relationship between co-operative members' switching behaviour and their complaint behaviour, including their assessment of co-operative management responses to complaints.

The aim of the study was to identify determinants for the farmers' commitment and loyalty to co-operatives. To investigate this commitment and loyalty, five indicators were identified from previous research, focusing on farmers' behaviour towards co-operatives: 1) Farmers' satisfaction with their co-operative; 2) Farmers' willingness to use the co-operative to advance their own interests; 3) Farmers' commitment to their co-operative in terms of their readiness to exit; 4) Farmers' ability to raise their voice; and 5) Farmers' assessment of the impact that their complaints have had on the co-operative.

The measure of loyalty used in the study was the number of switches between co-operatives and IOFs. A vast majority of the farmers in the sample had never switched to an IOF. This led us to choose an econometric model that could handle data with many zeros (non-switchers). This required an assumption to be made concerning the existence of a regime-splitting mechanism distinguishing between two groups; the "never switching" farmers and those switching 1-7 times during the last three years. The best model for such

samples proved to be the robust zero-inflated Poisson model, which consists of two separate, but simultaneous, regressions. The Logit part of the model estimated the underlying factors determining the pseudo-log odds of being in the "never switching" regime, i.e. staying loyal to the co-operative organisation. The Poisson regression estimated the factors affecting the likelihood of the number of switches. The results of the Logit regression show that farmers are less likely to be committed – the never switching one – when they are willing to use their co-operative to reap benefits for themselves, when they are willing to switch to another buyer if the get the same benefits or when they complain to their co-operative organization. At the same time the results of the Poisson part of the model indicate that the higher the farmers value their co-operative the less they switch.

Section 2 describes the theory of commitment and loyalty as depicted in the literature and the justification of the hypotheses associated with factors 1-5. Section 3 provides information regarding the sample and the measures used in the study and Section 4 presents the methodology employed. The results of the study are presented and discussed in Section 5 and choice of model and uncertainties are assessed in Section 6. Conclusions based on the empirical findings are presented in Section 7.

2. Theoretical Framework
2.1 Commitment and loyalty in previous research

A number of previous studies have analysed the behaviour of co-operative members in specific decision-making situations, such as choosing between a co-operative and an investor-owned partner firm (Bravo-Ureta and Lee, 1988; Cain et al., 1989; Jensen, 1990; Wadsworth, 1991; Lind and Åkesson, 2005; Zeuli and Betancor, 2005). Others have examined how various practices carried out by the co-operative affect the opinions of members (Misra et al.,1994; Bhuyan, 2007).

A variety of explanatory variables are presented in these studies, such as farm size, co-operative dividend policy, raw product price level and farm specialisation. Some studies report that the various economic factors affecting the profitability of farm enterprises are important for member loyalty and other expressions of satisfaction (Fulton and Adamowicz, 1993; Gray and Kraenzle, 1998). Others have found that co-operatives constitute an assured marketing channel and provide services to members and the community and these factors are more important than price levels (Bravo-Ureta and Lee, 1988; Cain et al., 1989; Jensen, 1990; Hernández-Espallardo et al., 2013).

Socio-psychological variables have been found to be important in previous studies. Robinson and Lifton (1993) mention lack of social cohesion and commitment, while Siebert (1994) identifies conservatism and individualism as inhibiting factors to co-operative development. Fahlbeck (2007) claims that members' ideological and traditional view of co-operatives explains their preference for unallocated equity capital, while Borgen (2001) found that the more farmers identify with the co-operative, the more trust they have in its managers. In a study of members' view of their influence in the co-operative Bhuyan (2007: 289) found that "the likelihood of co-operative abandonment was higher if members perceived that their input was not valued by the management in making decisions" and "Regarding member dissatisfaction with their ability to have a voice in their co-operative's decision making process, older members are more likely to be dissatisfied".

2.2 Hypotheses

Co-operative members may be influenced by tradition, either in the sense of continuing the family business with the same business partners (Enander et al., 2010) or by passing bad

experiences of co-operative membership down from generation to generation (Anderson and Henehan, 2005). Kool (1994) noted the importance of habit when it comes to farmers' selection of an trading partner, while others emphasise the importance of personal relationships between the co-operative's staff and the farmer (Kool, 1994). Regardless of what lies behind previous experiences (tradition, habit or trust), there is indication of linkages to commitment, resulting in the hypothesis:

H1: Members who value previous experience of a co-operative are less likely to switch to an IOF.

Farmers want to improve their economic conditions through cooperatives. Österberg and Nilsson (2009:194) state that "members attach strong importance to their participation in the democratic governance", which forms part of the fundamental member control principle of co-operatives. However, instead of valuing the democratic principles of the co-operative, some farmers may be motivated to join the co-operative in order to exercise power to promote their own interests, despite the overall loss of efficiency this causes for the co-operative. These can be considered less committed members.

H2: Members who use the co-operative to advance their own interests are more likely to switch to an IOF.

According to Nilsson (2001), values such as solidarity, equality and fairness are important to advance effective operation and further growth of the co-operative: volume increases with membership and economies of scale appear. The establishment of a collective identity among members of a co-operative not only reduces negative effects deriving from vaguely defined property rights, but also reinforces the notion of solidarity among members. Farmers who identify strongly with the co-operative will develop a stronger sense of commitment and will refuse to leave the co-operative for an IOF that offers the same advantages. However, farmers who do not identify strongly with the co-operative will consider the negative effects of the co-operative and leave for an IOF that offers the same advantages. Therefore:

H3: Members who are willing to switch if they get the same advantages from an IOF are more likely to switch to an IOF.

As Hirschman´s exit, voice and loyalty thesis (1970) states, dissatisfied members can exit the organisation or express their dissatisfaction by "raising their voice". When members raise their voice, the management has the option to investigate the source of member dissatisfaction and resolve the issues. If the exit option prevails, membership declines, and eventually the co-operative will fail. However, dissatisfied members may choose not to raise their voice or exit the co-operative. These members are characterised by high level of loyalty to the co-operative, but their behaviour prevents the management from obtaining the necessary information to improve the organisation. The exit and voice options are actions sending the same message, dissatisfaction, to the management, but exiting is an easier option than "staying and fighting". Empirical results confirm the relationship between loyalty and voice (Hoffmann, 2006). Likewise, Cechin et al. (2013b, 458) found that "farmers' economic motivation affects the likelihood of them participating pro-actively in the governance of the cooperatives". The following hypothesis results:

H4: Members who complain or make proposals are less likely to switch to an IOF.

When dissatisfied members of the co-operative take the option of raising their voice to complain or report problems, management may respond by improving services and eliminating the problems. Members could either expect management to correct problems or have their voice "lost" due to the co-operative's large size, complexity, poor organisation or other fault or inefficiency. However, regardless of members' expectations, it is rational to assume that when members perceive that various changes happen after they raise their voice, their satisfaction with the management of the co-operative and their overall satisfaction will increase. Therefore:

H5: Members who believe that their complaint or proposal led to a change are less likely to switch to an IOF.

3. Data
3.1 Data and sample

The empirical data originate from Finland, which represent an interesting hybrid co-operative model. They combine farmer control of the organisation with allowing external financiers. They have achieved this by introducing two distinct classes of shares, which enable members to retain control but also having stock floating at stock exchange.

Data were collected via TNS Gallup through a survey of a representative sample of Finnish farmers, both members and non-members of cooperatives. This market research bureau conducts regular surveys of farmers, and a number of questions for this study were included in one questionnaire. A letter containing the questionnaire was sent to 2,400 Finnish farmers in the summer of 2010. The letter included a link for answering electronically. About 60% of the answers came through that link, the rest by mail.

The number of respondents who declared that they are members of a cooperative was 1,296. However, many of these respondents did not fully complete the questionnaire, so the number of usable questionnaires was 484. This corresponded to 20.1% of the total sample and 37.3% of the respondents who reported being cooperative members. The main production enterprises on the farms concerned are presented in Table 1.

The average farm size in the sample was 48.7 hectares, compared to 49 hectares in Finland. The average number of cattle per farm in the sample was 26, while the average for Finnish farmers is 27. These figures indicate that the data were obtained from a representative sample of Finnish farms. The average age of farmers in the sample was 57.2 years and 84% were male. It is common practice for the average Finnish farmer to be a member of more than one co-operative. In our sample, 29% of the responders belonged to a dairy co-operative, 58% belonged to a forest co-operative and 28% belonged either to a meat co-operative.

Table 1: Production orientation of farmers responding to the survey

Production orientation	Percentage of farms
Dairy cattle	28.3
Other cattle	11.6
Pigs	7.9
Other farm animals	2.3
Grain	31.15
Other crops	8.5
Other enterprise	4

3.2 Variables and measures

The number of switches between a co-operative and an IOF was used in this study as a proxy to measure loyalty. This dependent variable was allocated a value from zero (the member never switched) up to 7 (maximum number of switches recorded). The questionnaire included the following three statements, which respondents were asked to answer on a 5-point Likert scale, with 1 = Fully disagree and 5 = Fully agree (Table 2):

- Experience of long-term co-operative membership keeps me a member of this co-operative.
- A possibility for advancing my own interests through the co-operative keeps me a member of this co-operative.
- If I get the same advantages through delivering my products to another buyer, I do not have any problem about switching buyer.

The respondents were also asked to answer two numerical questions (Table 2):
- During the last three years, how many times you have complained or proposed something to the co-firm. to which you deliver your products?
- How many times has your complaint or proposal led to a change?

4. Methodology

To examine hypotheses H1-H5, a robust zero-inflated Poisson (ZIP) regression was employed. The dependent variable was the number of times the respondents had switched between co-operatives and IOFs in the preceding three years. The number of switches was then used as a measure of loyalty, particularly in relation to the independent variables. ZIP regression is useful for modelling empirical data containing a large amount of zero counts. In our case, 77% of the observations in the sample were zero (missing values excluded). The number of observations of more than three switches (1.1%) is too small for these to be treated as distinct categories and therefore 4-7 switches were aggregated to one (>3 switches).

Theory suggests that in cases with a large amount of zero observations, those zeros are generated by a discrete process from the count values and hence can be modelled independently. The ZIP model consists of two parts; a Poisson count model and a Logit model to predict many zeros (UCLA: Statistical Consulting Group). According to Lambert (1992), the data derive from two different regimes. In the first regime, R_I, the outcome is always zero and the probability of an observation belonging in R_I is ω_i. In the second regime, R_{II}, the counts follow a Poisson distribution, with the probability of an observation belonging in R_{II} being equal to $1 - \omega_i$.

Therefore, in the present case the dependent variable (number of *Switches$_i$*) took values:

$$\text{Switches}_i = \begin{cases} 0, & \text{with probability } \omega_i + (1 - \omega_i)exp^{-\lambda_i} \\ r, & \text{with probably } (1 - \omega_i)exp^{-\lambda_i}\dfrac{\lambda_i^r}{r!} \end{cases} \quad (1)$$

The conditional mean of the Poisson regression, λ, and the parameter ω_i were calculated as follows:

$$\log(\lambda_i) = X\,\beta \quad (2)$$

$$logit(\omega_i) = log\omega_i/(1 - \omega_i) = Z\,\gamma \quad (3)$$

where β and γ are vectors of coefficients and X and Z are vectors of the covariates. The log-likelihood L of the ZIP regression is given by the following function:

$$L(\gamma, \beta; Switches_i) = \sum_{Swit_i=0} log\left\lfloor exp^{Z_i\gamma} + exp(-exp^{X_i\beta})\right\rfloor$$

$$+ \sum_{Swit_i>0} \left(Switches_i\, X_i\,\beta - exp^{X_i\beta}\right)$$

$$- \sum_{i=1}^{n} log(1 + exp^{Z_i\gamma})$$

$$- \sum_{Swit_i>0} log(Switches_i!) \qquad (4)$$

where X_i and Z_i are the ith rows of X and Z, respectively. The final estimation specification function is given below:

$$Switches_i = \left(exp(\delta_0 + \delta_1 ideology_i + \delta_2 experiences_i + \delta_3 power_i \right.$$
$$+ \delta_4 shelter_i + \delta_5 purebusiness_i + \delta_6 readiness_i$$
$$+ \delta_7 information_i + \delta_8 complain\backslash propose_i + \delta_9 impact_i$$
$$+ \delta_{10} age_i + \delta_{11} size_i + u_1))$$
$$/((1$$
$$+ exp(\zeta_0 + \zeta_1 ideology_i + \zeta_2 experiences_i + \zeta_3 power_i$$
$$+ \zeta_4 shelter_i + \zeta_5 purebusiness_i + \zeta_6 readiness_i$$
$$+ \delta_7 information_i + \delta_8 complain\backslash propose_i + \delta_9 impact_i$$
$$+ \delta_{10} age_i + \delta_{11} size_i + u_2)) \qquad (5)$$

To test the fitness of the ZIP regression over the regular Poisson model, i.e. test whether there was indeed a mechanism dividing co-operative members into two regimes, we used a test statistic initially developed by Vuong (1989) for non-nested models. The statistical package used for the calculations was StataIC 11(64-bit). In order to obtain robust standard errors of the estimated parameters, the vce(robust) option was used to control for small violations of the underlying assumptions (Cameron and Trivedi, 2009).

Table 2: Descriptive statistics for the different independent variables investigated in the study

Variable	No. of observations	Mean	Standard deviation	Min	Max
Experience	590	3.576	1.168	1	5
Power	587	3.0766	1.1563	1	5
Readiness	591	3.455	1.120	1	5
Complain and propose	564	1.145	1.918	0	9
Impact	485	0.570	1.312	0	9
Age	601	58.056	10.059	20	19
Size	571	50.889	48.110	0	690

Table 3: Distribution of questionnaire responses to the 5-point Likert scale statements

Variable	1	2	3	4	5	-
Experiences	50	48	136	224	132	30
Power	67	98	217	133	72	33
Readiness	60	80	148	137	166	29

5. Results and Discussion
5.1 Model comparison

The results from the robust ZIP model are presented in Table 4. First the Logit regression was generated to estimate the "never switching" regime, predicting the pseudo log odds of a farmer being a member of the group of farmers who never switched to an IOF. In other words, this part of the model explained the variables which increased (decreased) the probability of a farmer never switching to an IOF. The Poisson regression then estimated the different counts for those farmers who were not in the first regime, predicting the expected pseudo log counts for the farmers who had switched at least one time. The two models were later combined. The Vuong test suggested that there was indeed a mechanism dividing farmers into two regimes and therefore the ZIP model was preferable to a standard Poisson regression (Z=5.39).

5.2 Results

H1: Members who value previous experience of a co-operative are less likely to switch.

This hypothesis was accepted ($p < 0.1$). The variable 'past experience' was found not to have any explanatory power in the Logit part of the model, which determined the probability of a farmer being in the "never switching" group. However, it was significant in the Poisson regression, i.e. farmers who value past experiences of operating within a co-operative switch less.

Table 4: Results obtained using the Poisson and Logit parts of the robust zero-inflated Poisson (ZIP) model

Variable	(1) Poisson	(2) Logit
Experience	-0.205**	-0.316
	(0.0970)	(0.311)
Power	-0.423***	-0.489*
	(0.111)	(0.290)
Readiness	-0.167*	-0.843***
	(0.0976)	(0.326)
Complain and propose	-0.218***	-1.824***
	(0.0807)	(0.619)
Impact	0.186***	-0.328
	(0.0686)	(0.248)
Size	-0.00302	0.0003
	(0.00248)	(0.00576)
Age	-0.0247***	-0.0173
	(0.00837)	(0.0261)
Constant	3.972***	8.131***
	(0.482)	(2.728)
No. of observations	407	407

Robust standard errors in brackets
***p<0.01, **p<0.05, *p<0.1

H2: Members who use the co-operative to advance their own interests are more likely to switch.

Hypothesis H2 was rejected, although it was found to be statistically significant in both the Logit and Poisson parts of the model. The results generated by the model revealed a peculiar contradiction. On the one hand, the negative sign of this coefficient in the Logit regression indicated that farmers willing to use the co-operative to advance their interests were less likely to be included in the "never switching" group. In other words, the probability that these farmers would switch at least once increased. On the other hand, the negative sign in the Poisson regression indicated that those farmers who had switched and who tried to advance their interests through the co-operative were less likely to switch often to an IOF. A possible explanation derives from the forces motivating a farmer to patronise a co-operative. The profile of a farmer who was willing to manipulate the co-operative organisation to advance his or her own interests but who did not succeed, and therefore switched to an IOF, fits the results indicated by the model. Such farmers probably had little or no interest in returning to the co-operative, since their initial target was not accomplished. This behaviour could explain why the number of switches later decreases. Of course, this contradiction in the results could be due to data inconsistencies.

H3: Members who are willing to switch if they get the same advantages from an IOF are more likely to switch to an IOF.

Hypothesis H3 was not accepted, although it was found to be statistically significant in both parts of the model. Specifically, the Logit part of the model showed that readiness to switch was negatively correlated with commitment, while the Poisson part showed a positive correlation. To understand this contradiction, we can relate the farmers' choice of trading partner to the theory of repeated games as suggested by game theory (Radner, 1981). Thus, after changing to a different buyer, a farmer perhaps realises that it was not worth leaving the co-operative just for the promise of the same advantages.

H4: Members who complain or make proposals are less likely to switch to an IOF.

Hypothesis H4 was rejected, although it was found to be significant in both parts of the model. The ZIP model revealed this antithetical relationship between the number of complains or proposals and switching behaviour: the more a farmer proposed or complained, the less likely he or she was to belong to the "never switching" group of farmers ($p<0.1$). Yet among the switchers, the same variable tended to decrease the number of switches significantly ($p<0.05$). Contradictory as it may seem, the model indicated sufficiently rational behaviour. The initial purpose of this variable was to capture the active participation of the members as reflected by them complaining and making proposals to the co-operative. However, the way in which the statement was formulated in the questionnaire could have generated misleading results. In particular, the Logit part of the model indicated that members who complained were more likely to switch. It came as no surprise that dissatisfied members switched at least once, meaning they were unlikely to be part of the "never switching" group. However, the more the switchers complained, the lower the number of switches, a finding which could capture the relationship between active participation and switching – active members are expected to switch less. In all, the more a member complains and proposes to the co-operative, the more active he or she becomes and therefore loyalty increases, but there is a threshold for the "never switching" group which inverts the relationship between complains and proposals and the switching behaviour. Another way to explain the results stems from the theoretical approach discussed in section 4. Hirschman (1970) portrays dissatisfied members who do not raise their voice and do not switch as a threat to the organisation, since they do not inform the management about the inefficiencies that may exist in the co-operative.

H5: Members who believe that their complaint or proposal led to a change are less likely to switch to an IOF.

Hypothesis H5 was rejected, although statistically significant. The Poisson regression suggested that the number of times a proposal by a member led to a change increased the number of switches. One can question whether it is rational for a farmer to turn to an IOF after noticing that his or her comments had an impact on the co-operative. A time-lag could explain this behaviour, i.e. the farmer noticed the changes after he or she switched to an IOF. Another possible interpretation is based on the individual characteristics of the farmers whose comments led to a change. These are most probably farmers with advanced technical and persuasive skills, articulated and probably with a higher educational background, given that their proposals were actually adopted by the co-operative. It would not be surprising if a farmer, on realising that his or her proposals had an impact on the organisation, decided to exercise the exit option in order to alter the co-operative portfolio or policies. Hakelius et al.

(2013) provide an example where dissatisfied farmers who had strong entrepreneurial skills and who had previously exercised their voice decided to leave their co-operative and form a new one.

6. Choice of model and uncertainties

The aim of the research was to identify determining factors for the commitment and loyalty of farmer members of co-operatives. As a means to estimate commitment and loyalty, we used the number of times that the members have switched between co-operatives and IOFs. However, the validity of the assumption that more switching meant less loyalty can be criticised. For example, a member who switched once to an IOF and later returned to the co-operative may be more loyal and committed to the co-operative than a member who had never switched. However, our aim was not to determine the current state of members' loyalty and, even if the returning member is more loyal, in the recent past that member took the decision to leave the organisation. Instead, our aim was to investigate the factors that led members to exit the co-operative, whether or not they later returned.

The choice of econometric model used for the purposes of the study was the result of in-depth and extensive research. The existing literature suggests various models with numerous implementations for count data: Poisson, negative binomial, zero-inflated, hurdle models and threshold models are reported to be the most representative models regarding count data analyses (Greene, 1994; Hu et al., 2011; Cameron and Trivedi, 2013; Ridout et al., 1998). Because of the presence of a large number of zeros in the data set, Poisson and negative binomial models were rejected in favour of zero-inflated and hurdle models. The fact that the explanatory variables did not suffer from overdispersion, a situation which occurs when the variance is greater than the mean, suggested that the zero-inflated negative binomial model was not the best fit for the research data. The zero-inflated Poisson (ZIP) and Poisson-Logit hurdle regression differ substantially in the interpretation and analysis of the origin of the zeros in the data set. Specifically, while the ZIP model assumes both structural zeros (zeros that occur due to the specific structure of the data) and sampling zeros (zeros created by chance), the hurdle model makes the assumption of only structural zeros. This assumption cannot be supported by the theory and, furthermore, the Vuong test verified the existence of sampling zeros in our case. Finally, the threshold models assume "the existence of a continuous latent variable which when it lies at a specific interval then the response $Y = y$ is observed" (Ridout et al., 1998). The nature of the variables in the present study (non-continuous) and the lack of conceptual framework to support the basic assumption of the model both led to its rejection.

7. Conclusions

Member commitment and loyalty are crucial for the success of co-operatives. Hence the managers should know how the farmer-members think when they are considering whether to remain in the co-operative or to leave it. Some conclusions from this study are:
- Members may want to switch from their co-operative to another trading partner if they consider that this alternative will better serve their own interests.
- Some members complain little and never switch to another buyer.
- Members who are ready to switch to get the same benefits will most likely switch at least once.
- Members who are likely to switch will switch even if the management meets their requests.

- Younger farmers are more prone to switch, while older farmers are less.

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