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# Journal of Cooperatives

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# Principal-Agent Relationships in Agricultural Cooperatives: An Empirical Analysis from Rural Alberta

***Timothy J. Richards, K. K. Klein, and A. Walburger***

Cooperatives throughout North America are consolidating at an increasing rate and for a variety of reasons. While many cooperatives merge with others or are acquired to achieve greater economies of scale, several fail due to changes in the external economy, which make them redundant. Often, such redundancy is reflected in a heightened sense of member dissatisfaction. Many argue that such dissatisfaction is likely to arise in cooperatives as a result of principal-agent problems. In order to determine whether or not cooperative managers maintain the same goals as their owners, this study uses data from a member-survey to compare Alberta cooperative members' objectives with those they believe to be held by their cooperatives' managers. An econometric model of the difference between members' expectations and perceptions shows how various socioeconomic variables affect the extent to which these objectives are aligned. The results of this analysis can help cooperative boards design managerial incentive programs to better align their goals with those of the cooperative membership.

## Introduction

The Agricultural Cooperative Service (ACS) of the United States Department of Agriculture (USDA) reports a variety of statistics on the health of the cooperative sector. For example, during the 1980s and early 1990s the agricultural cooperative sector in the United States experienced a period of rapid consolidation. In 1984, there were 5,782 marketing, farm supply, and service cooperatives, but by 1993, there were only 4,244—a reduction of 27% (USDA 1994). These cooperatives were lost to dissolution (39.9%), merger (23.8%), acquisition by either cooperatives or proprietary firms (18.6%), and for a variety of other reasons (17.7%). Although similar information on Canadian cooperatives does not exist, the message to cooperative managers is universal.

While business failure is a common and necessary occurrence in a market economy, the fact that cooperatives are most often organized to provide service-at-cost means that they are less likely to be abandoned for pure financial reasons. Sometimes, the changing structure of the agricultural economy or changes in technology may obviate the need for a cooperative, but many argue that there are inherent characteristics of cooperative governance that are responsible for members' decisions to dissolve their businesses.

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In particular, Porter and Scully (1987); Ferrier and Porter (1991); Staatz (1984); and Caves and Petersen (1986) argue that principal-agent problems permeate cooperatives to a greater extent than in proprietary firms.[1] Fama (1980) maintains that proprietary firms with stock that trades on public stock exchanges are subject to continual scrutiny and performance assessment. Cooperatives, on the other hand, have no market for their equity, so owners have less of an incentive to monitor the actions of their managers. Furthermore, managerial compensation is often based on the financial performance of the firm. At least in theory, or according to traditional cooperative principles, however, the objective of a cooperative is not necessarily to generate profit, but to provide service, information, and other non-quantifiable variables. Lacking a common metric from which to design managerial compensation schemes, cooperative owners are less able to provide incentives to managers to align their personal objectives with those of the organization. Such problems of managerial control are examples of what Sappington (1991) describes within the general class of principal/agency relationships.

The objective of this study is to conduct an empirical analysis of cooperative members in Alberta, Canada, in order to determine the extent to which cooperative manager and member objectives are aligned. If differences exist, this study seeks to determine what types of cooperative members are more likely to have negative impressions of their managers' performance. Specifically, the analysis compares members' expectations of what cooperative objectives should be with their perceptions of how cooperative managers rank the same set of objectives. If there is a wide divergence between these two, particularly where objectives that are important to members are not perceived to be important to managers, then this is interpreted as an indication of unsatisfactory managerial performance. In these cases, cooperative members are less likely to continue to support their cooperatives in difficult financial times. Armed with knowledge, cooperative boards will be better able to design incentive plans for managers to achieve the goals of members, or to achieve better understanding between the principals (members) and the agents (managers) as to the intended economic role of their cooperatives.

The first section of the paper presents a simple economic model of the relationship between cooperative members and their managers. This framework suggests that member satisfaction with a manager's performance is likely to vary by member characteristics. The third section describes an empirical model intended to determine the factors that cause cooperative members' assessments of managerial performance to be either favorable or unfavorable. This section defines performance in terms of the ability of a manager to align his or her objectives for the organization with those of the membership. Presentation and discussion of the results of this model follow in the fourth section, while a concluding section draws some implications for cooperative governance and stability.

## Economic Model of Cooperative Owner-Manager Relationships

Relationships between owners and managers of a firm often focus on the fundamental asymmetry of information between principals, (owners), and agents, (managers). The key variable that is only partially revealed to ownership by management is the amount of effort ($e$) management puts forth in trying to achieve management objectives. Owners' net income, or, in the case of cooperatives, total net benefit ($B^*$) rises in managerial effort, but falls in managerial compensation. Managers' salaries are assumed to be proportional to the total amount of benefits that they create, so the problem from the owners' perspective is to choose an incentive plan ($w^*$) that implements the optimal amount of effort ($e^*$) from managers in order to maximize total net benefits (Grossman and Hart 1983):

(1) $$B^* = \max_w E[B(e,\epsilon) - w(B(e,\epsilon))]$$

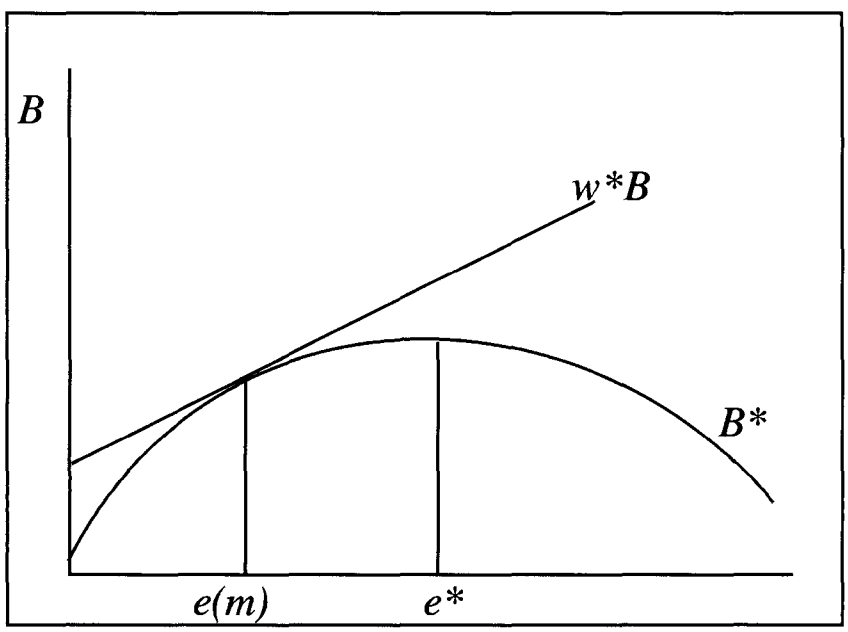
where $E$ is the expectation operator, $B$ is the gross benefits function, and $\varepsilon$ is a random variable. The owners' compensation plan, $w^*$ maximizes (1) subject to the managers' participation constraint (Tirole 1988):

(2) $$\max_e EU[w(B(e,\epsilon)),e] \geq U_o,$$

where $U_o$ is the minimum level of utility a manager requires before he or she will work for the firm. Further, the wage contract must also be "incentive compatible," or must induce a level of effort that maximizes the agent's expected utility in (2) for all possible values of $e$.

The usual implication of this framework is that, if the owners are risk neutral, under full information the owners will provide management with full insurance—or a constant wage, $w$ (Tirole 1988). However, with a constant wage, individual managers do not necessarily make decisions in order to maximize the net benefit to cooperative owners, due to the fact that owners must compensate managers for the disutility of effort. In this simplest case, suppose that the members' benefit function (assumed to be the same for all members) is concave in managerial effort, and the managers' compensation scheme is linear in benefits. Figure 1 shows the level of effort that owners regard as optimal ($e^*$) and that which management is likely to provide ($e(m)$) (Gravelle and Rees 1981). Thus, equilibrium between the objective function of the manager and owners occurs at a point of lower effort than is optimal from the owners' point of view. Although this diagram provides a simple representation of the problem, analytical solutions of the stochastic version in (1) are less straightforward, particularly in the case of cooperatives.

**Figure 1. Managerial Effort and Member Benefits**



For a proprietary firm, the value of $\varepsilon$ is attributable to random variation in profit due to weather, market conditions, or other factors. With cooperatives, however, "benefits" are not measurable like profits, nor are they single valued like profits. Rather, cooperative benefits flow from a variety of sources—favourable prices, assured markets, pooling risks, community involvement, or member service, to name a few (Cobia 1989). Furthermore, member heterogeneity means that the expected contribution to total benefit from each cooperative activity is likely to be different for each member. As a result, characterizing the optimal compensation contract becomes doubly difficult. Defining the cooperative "benefit function" is a necessary first step in this direction.

The idiosyncrasy of cooperative benefits means that they will differ not only from member to member, but the benefits perceived by individual members will differ from those that are measured by the cooperative's managers. Thus, deviations between the benefits perceived by members, from which the compensation plan is derived, and by managers, with which the results of their efforts are measured, are indicators of less-than-satisfactory managerial performance used in this study. To obtain a measure of the difference between the two benefit functions, define total cooperative benefits to members, or owners, as ($B^o$), a weighted average of each of the benefits attributed to cooperative membership. Because each member subjectively determines these benefits, perceived benefits offered by the cooperative vary according to the type of member. Member type is determined, in turn, by a vector of characteristics such as age, education, off-farm income, or farm size. For member j the total benefit from belonging to the cooperative is given by:

$$B_j^o(e,\epsilon,\theta_j) = \sum_i p_i b_i^o(e_i,\epsilon_i,\theta_j) \tag{3}$$

where $b_{ij}^o$ is the member of type j's perception of the $i^{th}$ component of the benefit function, $p_i$ is the weight attributed to the $i^{th}$ benefit, and $\theta_j$ is a vector of characteristics describing the $j^{th}$ member. On the other hand, cooperative managers cannot anticipate the variety of demand from different members, so evaluate their own performance on the basis of the observable components of the net benefit function alone:

$$B^m(e,\epsilon) = \sum_i p_i b_i^m(e_i,\epsilon_i). \tag{4}$$

This imperfect measure of $B^o$ is based upon the measurable performance of the cooperative in terms of retained surplus, growth rates, market share, or some other indicator. Clearly, the degree of misalignment of member and manager objectives depends upon the size of the difference between each owner's benefit function and the one that determines managerial behavior.

Defining the effect of owner-heterogeneity, $\lambda(\theta_j)$, as a multiplicative factor and the inherent randomness of benefits ($\varepsilon$) as an additive term provides an expression for the difference between owner and manager-perceived benefits:

$$B_j^o - B^m = \sum_i p_i(b_{ij}^o\lambda(\theta_j) + \epsilon_i - b_i^m) \quad \forall\, j \in J, \tag{5}$$

assuming that the weights are the same in each function. The function describing owner-heterogeneity is interpreted as an index measure of the effect of differences in socioeconomic background among owners on their relative valuations of the benefits that cooperatives are theoretically able to provide. The assumption that heterogeneity can be explained by socioeconomic factors is a strong one and is one that is commonly made, but is necessary to implement the empirical model. To better align the objectives of members or owners and

managers, therefore, the second-best solution to the cooperative members' problem becomes one of choosing the weights, $p_i$, in order to minimize the difference between members' and managers' benefit functions. The first-order conditions to this problem are given as:

$$b_i^o \lambda(\theta_j) + \epsilon_i - b_i^m = 0, \quad \forall\ i \in I. \tag{6}$$

Solving (6) for the member-index function provides an equation for each cooperative benefit that shows the ratio of manager to owner perceptions as determined by the member-index function and a random error term:

$$\lambda(\theta_j) = b^m / b_i^o + v, \tag{7}$$

where $v = -\varepsilon/b_i^m$. In this equation, if the value of $\lambda(\theta_j)$ is equal to one, then all the difference between owner and manager perceptions are due to random influences. If, on the other hand, $\lambda(\theta_j)$ is not equal to one, then the parameters on the components of $\theta_j$ show how owner characteristics are related to the difference in perceptions. Information on the relationship between $\theta_j$ and the ratio of perceived benefits can help cooperative owners determine compensation mechanisms in order to better align objectives of owners and managers, thereby reducing the impact of conflicting objectives on member satisfaction.

## Empirical Model of Cooperative Member-Manager Relations

Estimating (7) requires an explicit functional form for $\lambda$. In the absence of any prior information to the contrary, $\lambda$ is specified as a linear function of owner characteristics:

$$R_i = \alpha_{io} + \alpha_{i1}F + \alpha_{i2}O + \alpha_{i3}A + \alpha_{i4}E + \alpha_{i5}S + e_i \tag{8}$$

where: $R_i$ is the benefits ratio, $F$ is farm-size in terms of the number of seeded acres, $O$ is the proportion of income earned from off-farm sources, $A$ is owner age, $E$ is the level of education, and $S$ is the level of sales. In addition to this benefit-by-benefit estimation method, an aggregate model of the form of (5) was estimated with non-linear least squares in order to test the hypothesis that $\lambda = 1$. In order for this model to be identified, however, it is necessary to assume that the weights on each of the benefits are fixed and equal to each other. Each of these models are estimated with survey data from the province of Alberta, Canada.

The survey sample for this study consists of a cluster of 2,500 individuals chosen randomly from a list of subscribers to the *Western Producer*, an agricultural newspaper published by the Saskatchewan Wheat Pool. This sample provides 792 useable responses—a return rate of 31.7%. Inspection of the data reveals a relatively low proportion of young farmers, a relatively high education level, and a disproportionate number of large farms. Although the differences are not large, they may still bias the results somewhat. The individual questions measuring respondents' evaluation of cooperative performance are given in the appendix.

Survey respondents are asked two questions concerning their cooperatives' goals. The first asks how important (1=very important, 7=not important) members believe cooperative managers regard a particular goal. The second asks how important members think cooperative managers should regard the goal. Cooperative goals include each of the potential benefits that cooperatives are theoretically able to provide relative to their proprietary rivals. These include favorable prices, member input, product variety, service quality, expert advice, quality products, education and information, proximity, fulfilment of a social responsibility, return on equity, community involvement, adherence to cooperative principals, and several others.

Using the Likert scale responses, the index of "cooperative satisfaction" is created as a ratio of each member's perception of the degree of importance management places on a particular goal over the member's own expectations of how important that goal should be to the cooperative. An index value greater than one, therefore, means that the member regards the goal to be more important than he or she believes cooperative management does. A value less than one implies the opposite: the member believes that cooperative management regards a particular objective as relatively more important than he or she does. Only if member and management goals are perfectly aligned will the index value be equal to one. While both values less than or greater than one indicate a problem in communication between the two groups, deviations above one are seen as the more onerous, because they imply that management is not achieving the goals that the members, as owners, hold important.

The responses to this question are analyzed in two ways. First, a simple cross tabulation shows the index values for farmers in the extreme categories of four socioeconomic variables: age, off-farm income, sales, and education. By choosing the extreme categories in each, these tables will show, for instance, how closely aligned the cooperative's goals are to the youngest farmers and then to the oldest farmers. Similar comparisons are made for each of the other variables. Second, simple regressions of (8) are specified in order to estimate the linear relationship between the set of socioeconomic variables and the satisfaction index.

## Results and Discussion

Four key characteristics serving to differentiate groups of farmers consist of their age, the percentage of income that they earn from off-farm sources, their level of education, and the size, in terms of sales, of their farming operation. As the theoretical model suggests, unobservable characteristics of the owners and the managers, such as their aspirations or objectives, will determine whether or not the goals of each are aligned. While no information is available on the characteristics of the managers, the cooperative survey provides data on these member types that act as indicators of the extent to which the two groups' objectives do not agree. First, cross tabulations provide descriptive measures of the effect of each of these traits, while a more formal statistical model follows.

Table 1 shows the value of the satisfaction index for the extreme categories of each of the member traits and each of the components of the cooperative objective function. Comparing the responses of the youngest (< 35 years of age) to the oldest (> 55 years) yields some interesting results. Perhaps the most important criterion by which to judge cooperative performance is in terms of the price either charged (supply cooperative) or obtained (marketing cooperative). Since a higher index value indicates a greater level of dissatisfaction with cooperative management, the first comparison in the table shows that, although both groups are dissatisfied with management goal setting, younger members appear to place a far greater emphasis on price relative to management than do older members. Differences between the two age groups are also both statistically and economically significant with respect to questions regarding variety, customer service, managerial expertise, quality, education, proximity, return on equity, and value added. Note that this list contains many of the variables that proprietary firms tend to use as strategic factors—price, return on equity, service, and variety. Younger members tend to place a relatively lesser importance on those items regarded as the non-economic benefits of cooperatives, such as member control or a strong voice in the community. This result suggests that the business components of a cooperative's strategy require greater emphasis if it is to survive into the future. Unfortu-

nately, this may also reveal a lack of understanding of cooperative principles among the younger respondents—cooperatives are not intended to generate profits, so their value should be measured by the sum of all the benefits they provide to producers.

**Table 1. Satisfaction Index by Age, Off-Farm Income, Sales, and Education**

| | Age of Member | | Off-Farm Income | | Farm Sales | | Education | |
|---|---|---|---|---|---|---|---|---|
| **Objectivea** | < 35 | > 55 | 0% | > 75% | < 50,000 | >250,000 | Gr. 8 | College |
| **Priceb** | *2.349 | 1.604 | 1.866 | 1.748 | 1.793 | 2.023 | 1.764 | 1.546 |
| **Input** | 1.704 | 1.569 | *1.852 | 1.625 | *1.586 | 2.167 | 1.725 | 1.759 |
| **Variety** | *1.624 | 1.268 | 1.409 | 1.404 | 1.352 | 1.498 | 1.352 | 1.445 |
| **Service** | *1.870 | 1.445 | 1.703 | 1.726 | *1.549 | 2.130 | *1.457 | 1.759 |
| **Expertise** | *1.906 | 1.455 | 1.781 | 1.639 | *1.540 | 2.186 | *1.492 | 1.919 |
| **Quality** | *1.820 | 1.378 | 1.577 | 1.663 | *1.434 | 1.927 | 1.417 | 1.523 |
| **Education** | *1.776 | 1.357 | 1.632 | 1.567 | 1.495 | 1.744 | *1.312 | 1.680 |
| **Control** | 1.508 | 1.363 | 1.609 | 1.485 | 1.419 | 1.669 | 1.487 | 1.803 |
| **Proximity** | *1.423 | 1.135 | 1.345 | 1.442 | 1.349 | 1.353 | 1.142 | 1.282 |
| **Social Role** | 1.203 | 1.145 | 1.192 | 1.118 | 1.126 | 1.241 | *1.281 | 0.935 |
| **ROE** | *1.745 | 1.420 | *1.814 | 1.580 | *1.442 | 2.172 | 1.489 | 1.615 |
| **Comm.** | 1.129 | 1.105 | 1.213 | 1.208 | 1.107 | 1.278 | 1.215 | 1.044 |
| **Value** | *1.599 | 1.308 | 1.594 | 1.667 | *1.445 | 1.898 | 1.322 | 1.475 |
| **Principles** | 1.423 | 1.314 | 1.428 | 1.503 | 1.371 | 1.409 | 1.441 | 1.361 |
| **N** | 61 | 322.00 | 343.00 | 98.00 | 224.00 | 118.00 | 73.00 | 79.00 |

[a]Note: variable definitions are found in the appendix. A value less than one indicates member regards the objective as less important than he or she believes cooperative management does. A value greater than one suggests that the member believes cooperative managers hold the objective to be less important than the member does.

[b]A single asterisk indicates that the means are significantly different at a 10% level using a t-test for the equality of means. The critical t-value is approximately 1.64 in all cases.

In fact, this is part of a more general result that reflects a common theme among the various questions asked—younger farmers are more concerned with "bottom line" and business performance issues than are older farmers. Many of these younger farmers were not party to the creation of the cooperative, so see little value in maintaining the cooperative for other than purely economic purposes. Therefore, it is, perhaps, not surprising to find that younger farmers are more likely to regard cooperative goals that do not concern financial viability as irrelevant. For instance, the two age groups differ in their assessment of management's ability to meet the service goals set by members. While younger members tend to think that management does not regard service as very important relative to members' needs, older farmers are less critical. Older members are also more likely to believe that management holds product quality equally as important as members do. In fact, younger members have a 32% higher index value, indicating that they believe the cooperative places too little emphasis on quality and product image. Again, this reflects the higher standard of commercialism among the younger members.

Younger members appear to not only value the social aspects of cooperatives less than the other age groups, but indeed to believe that cooperative management places too much importance on social objectives, although the mean responses from these two age groups are not statistically different at a 5% level. Point estimates of the mean responses to questions

regarding the role of cooperatives in the community and the adherence to traditional principles also show a greater ambivalence from younger members, but again these differences are not statistically significant. Perhaps portending continued erosion of the traditional cooperative, younger members do not regard cooperative principles as being as important as do older members. Given the aging farm population, these results should be of vital interest to cooperative boards, but age is by no means the sole factor determining the degree of dislocation between cooperative members and their managers.

With the increasing bimodal distribution of farm sizes in the United States comes a widening reliance on off-farm income sources between large and small farmers (Hallberg 1992). This creates a fundamental problem for cooperatives: with a one-member-one-vote system of control, the greater number of small producers often control the decision making process, but the larger members are responsible for a growing proportion of the value of cooperative output. Therefore, it is critical to know the areas in which the objectives of these two groups differ from those of the current management. As table 1 shows, compared to the age classification, farmers in different off-farm income groups tend to be relatively homogenous in their assessment of cooperative performance. Perhaps not surprisingly, the areas of greatest difference are in the profit and control aspects of management. Respondents that earn a large proportion of their income off farm are less likely to be interested in active control of the cooperative, and may, in fact, regard using the cooperative as the convenient alternative. Respondents that rely on farming for all of their income are also more dissatisfied with the lack of focus on price and return on equity—a result that is to be expected if they rely on the cooperative for their well being.

Perhaps surprising is the symmetry between the two groups with respect to the setting of social objectives by cooperative management. While both groups perceive their cooperative as treating social goals too lightly, neither is more critical than the other. Assuming that the group with less off-farm income is more likely to be composed of full-time farmers on larger commercial farms, it would seem reasonable to expect them to place greater value on business objectives and to place less value on the non-business aspects of the cooperative. On the other hand, those with little off-farm income are also likely to be more dedicated to the viability of the traditional farm business and, consequently, more willing to look beyond the purely economic roles of the cooperative. Off-farm income, however, does not capture differences in perceptions between farmers of different size.

Classifying farms by sales level facilitates the farm-size comparison. Many would argue that larger farmers are more likely to place a greater importance on the business aspects of cooperatives and less on the social role. Because they also have a lesser need for cooperative marketing or input purchasing, they are also likely to be more critical of managerial goal setting. In fact, table 1 shows this to be very much the case. While the satisfaction index value for large farmers is only 0.23 points higher than for small farms on the question of price, it is fully 0.73 points higher for return on equity. In other words, large farmers believe that cooperatives should regard profitability goals to be far more important than they do. This dissatisfaction among larger members extends beyond financial management of the cooperative to marketing variables. While relatively equally satisfied with the priority given product diversity, larger farmers tend to be highly critical of management's determination of service, expertise, quality, and value added objectives. Larger farmers also demand more member input than do their smaller counterparts. While the level of farm sales provides a proxy measure for the relationship between capital investment and cooperative assessment, differences in human capital investment are also important.

Although there is a high degree of heterogeneity in member education, some tendencies should be clear. Presumably aware of a greater range of marketing and input supply alternatives, members with higher education may be more demanding of their cooperatives. In fact, the opposite appears to be true in many cases. In particular, members with less education tend to take less favourable views of management's price setting priorities. However, the opposite is true of the complementary measure of financial performance—more-educated members think that management should focus more on the return on equity (ROE), although neither the price nor ROE results are statistically different between the two groups. Despite this seeming contradiction, their attitudes toward non-pecuniary issues appear to be more consistent. Members with a higher level of education tend to expect a higher quality of service and expertise from the cooperative staff. Somewhat surprisingly, the more educated members tend to contradict the younger respondents in terms of the social and community involvement of the cooperative. In fact, the "social role of cooperatives" provides the only instance where the index value falls below 1.0. More-educated members, it seems, would like their cooperatives to differentiate themselves more from proprietary firms on the basis of their roles as social institutions rather than simply places to do business. While this cross-tabulation suggests many differences in the benefits perceived by individual members, equation (5) requires a parameterization of these relationships in order to weight the individual benefit elements.

Simple linear regressions of each benefit-index value on the member traits provides such a parameterization. Because the explanatory variables in this model are categorical, except for seeded acreage, each observation assumes the value of its category midpoint. Although this approach is standard, Kmenta (1986) derives an estimator for the amount of bias due to this approximation. If the values of the explanatory variables are uniformly distributed within each category, the amount of bias is small. To the extent that the survey data deviates from this requirement, the regression results may be biased.

The first regression consists of a non-linear specification of (5) designed to test the null hypothesis that $\lambda = 1$. Using a likelihood ratio test, the value of the test statistic is 277.517, so the null hypothesis is easily rejected. This implies that the difference in the aggregate index value of managers and cooperative owners is due to factors other than simple random variation in the indices. On a more intuitive level, this result means that there is a significant difference between the objectives of owners and managers, and this difference is a function of the characteristics of the owners. Estimating the first-order conditions to the owners' problem provides more detailed information on the factors associated with a divergence between cooperative member and manager objectives.

These constitute the second set of regressions, the results of which are shown in table 2. Specifically, these equations parameterize the relative importance of the factors contributing to the ratio of members' expectations of cooperative goal setting and their perceptions of managers' priorities. The characteristics consist of seeded acreage, the percentage of income earned from off-farm sources, the level of farm sales, farmer age, and the highest level of educational attainment.

**Table 2. OLS Estimates of Cooperative Objectives and Member Characteristics**

| Objective | Acreage | Off-farm Income | Age | Education | Sales | Constant | R2 |
|---|---|---|---|---|---|---|---|
| **Price**[a] | 0.0009 | -0.0019 | -0.0128** | -0.0386 | -0.0110 | 3.4014** | 0.0265 |
| | (1.2840) | (-0.9381) | (-4.0860) | (-1.6480) | (-1.7740) | (8.7940) | |
| **Input** | 0.0004 | -0.0014 | -0.0066** | -0.0260 | 0.0019 | 2.6079** | 0.0104 |
| | (0.5739) | (-0.7103) | (-2.1104) | (-1.1020) | (0.3066) | (6.6900) | |
| **Variety** | 0.0001 | -0.0003 | -0.0073** | -0.0065 | -0.0010* | 2.1674** | 0.0199 |
| | (1.8090) | (-0.2365) | (-3.1880) | (-0.3774) | (-2.2520) | (7.6560) | |
| **Service** | 0.0001 | 0.0056 | -0.0103** | 0.0067 | 0.0005 | 2.3014** | 0.0247 |
| | (0.1870) | (0.3034) | (-3.5880) | (0.3115) | (0.9039) | (6.4320) | |
| **Expertise** | 0.0003 | -0.0009 | -0.0111** | 0.0126 | 0.0006 | 2.3216** | 0.0324 |
| | (0.4691) | (-0.4746) | (-3.8430) | (0.5837) | (1.0840) | (6.4930) | |
| **Quality** | 0.0004 | 0.0016 | -0.0069** | 0.0037 | 0.0005 | 1.9739** | 0.0206 |
| | (0.6997) | (0.9923) | (-2.8010) | (0.2018) | (1.0410) | (6.4750) | |
| **Education** | -0.0007 | -0.0011 | -0.0093** | 0.0035 | 0.0010 | 2.3297** | 0.0166 |
| | (-1.0930) | (-0.6062) | (-3.2250) | (0.1612) | (0.1734) | (6.5160) | |
| **Control** | 0.0008 | -0.0030 | -0.0060 | 0.0212 | -0.0010 | 1.9524** | 0.0108 |
| | (1.0620) | (-1.4630) | (-1.8610) | (0.8722) | (-1.6250) | (4.8660) | |
| **Proximity** | 0.0008 | -0.0084 | -0.0084** | 0.0138 | -0.0013** | 1.9546** | 0.0273 |
| | (1.4510) | (-0.5567) | (-3.5900) | (0.7854) | (-2.7870) | (6.7340) | |
| **Social** | -0.0001 | -0.0004 | -0.0014 | -0.0277 | -0.0006 | 1.6368** | 0.0056 |
| | (-0.0301) | (-0.2825) | (-0.0705) | (-1.8760) | (-0.1543) | (6.7110) | |
| **ROE** | 0.0004 | -0.0009 | -0.0104** | -0.0108 | 0.0005 | 2.5697** | 0.0216 |
| | (0.5471) | (-0.4220) | (-3.2960) | (-0.4534) | (0.8520) | (6.5460) | |
| **Community** | 0.0002 | -0.0005 | -0.0033 | -0.0184 | -0.0003 | 1.7690** | 0.0064 |
| | (0.4990) | (-0.4170) | (-1.7460) | (-1.3080) | (-0.9077) | (7.6020) | |
| **Values** | 0.0001* | 0.0023 | -0.0096** | -0.0130 | -0.0002 | 2.3209** | 0.0382 |
| | (2.7340) | (1.4650) | (-3.9100) | (-0.7090) | (-0.5089) | (7.6300) | |
| **Principles** | 0.0004 | 0.0005 | -0.0009 | -0.0155 | -0.0008 | 1.7676** | 0.0056 |
| | (0.6108) | (0.2840) | (-0.0353) | (-0.7847) | (-1.4570) | (5.4120) | |

[a] T-statistics are in parentheses. A single asterisk indicates significance at a 5% level, and a double asterisk indicates significance at a 1% level. Dependent variable definitions are given in the appendix.

Although the explanatory ability of each model is quite low, this is not atypical of cross-sectional studies, and it is sufficient to reveal some definite patterns in the survey data. Clearly the most important factor influencing members' dissatisfaction with their cooperative managers is the age of the respondent. Consistent with the findings of the summary statistics above, nowhere is this more clear than with respect to the price question. For example, with all regressors set equal to zero the constant term in the price equation indicates an index of dissatisfaction of 3.401, implying that respondents believe their managers do not consider favourable prices nearly as important as members do. However, this index falls by about 0.013 per year of age. While this is not enough to cause the oldest members in

the sample to contradict the younger, it is still a significant effect. Education and level of sales are also significant determinants (at a 10% level) of the difference between members' perceptions and their expectations of cooperative goals. However, members with more education or larger farms tend to think that cooperative managers' price goals are more in line with their own. This result perhaps reflects these members' greater understanding of how market prices are determined and a lesser sense of being disadvantaged economically.

Older members also more favourably regard cooperatives' performance with respect to allowing member input. Due to the structure of cooperative organization, older members are more likely to be involved in governing the cooperative, so are more likely to feel that their input is valued. Similarly, older members feel the cooperative better reflects their goals for product variety than do younger members. With respect to the variety variable, attitudes of farmers with different farm sizes depend upon how size is measured—in acreage terms, or in terms of dollar value of sales. In terms of seeded acreage, larger farmers tend to have negative views of cooperative performance, while farmers with more sales tend to have favourable views of cooperatives' variety goals. Objectives of service, quality, expertise, and education all follow patterns similar to member input. Namely, age is the only significant influence on performance assessment with older farmers taking a more positive view of their cooperative managers.

Farmers with a greater share of their income earned off farm tend to be more closely aligned with cooperative management on the issue of member control. Because of their greater dependency on sources other than the cooperative for their livelihood, these members are more likely to cede control to management than to expect to have an active role. This observation is also true of farms that are larger in terms of sales. Perhaps this reflects the movement in recent years toward more volume discounts and proportional representation within the cooperative. These members are beginning to feel that their greater economic importance has an impact on cooperative policy. Not surprisingly, age is again an important factor (at a 10% level) in the importance of member control. As older farmers have more time to spend managing their cooperatives, they are more likely to feel a sense of control. Age is also an important factor in explaining the deviation between members' expectations and perceptions of the importance managers place on proximity. Older farmers appear to be more satisfied with the importance placed on cooperative location, perhaps because they occupy the land closest to the market. Those members living on the market fringe would likely have ceded their land to new entrants who are more likely to make a profit in marginal areas. Larger farmers also tend to disagree with cooperative management less on the importance of proximity as compared to smaller farmers. Larger farmers capture a significant amount of their economies of scale through transportation savings—an advantage that is lost if they are far from the closest market.

Neither age nor farm size affects the assessment of cooperatives' roles in society. On questions concerning social involvement with other members, the role of the cooperative in the community, and the adherence of the cooperative to the basic principles, only education has a discernible effect. In particular, more-educated members tend to place greater value on the non-economic cooperative functions, perhaps seeing a greater purpose for agricultural cooperatives than simply marketing or acquiring goods. With respect to a purely economic objective, the importance of return to equity, again older farmers tend to believe their managers perform well. The same is true for their perception of the value of cooperative goods. However, farmers with more seeded acres tend to think that their managers under emphasize the importance of product value. This result reflects the fact that as farms become larger, they derive less benefit from being in the cooperative—ostensibly to obtain economies of scale that they can already achieve internally.

## Conclusions

Due to the lack of capital market discipline, a clear profit motive, and the transitive nature of ownership, cooperatives are believed to suffer from principal-agent problems to a greater degree than proprietary firms. Issues of corporate governance may contribute to many of the problems that cooperatives are now experiencing in maintaining member commitment and in satisfying an increasingly diverse constituency. Understanding the factors that contribute to this problem is critical for cooperative managers and boards of directors.

This study presents an analysis of Alberta agricultural cooperative member evaluations of cooperative managerial performance. Management performance is measured by comparing members' perceptions of the goals actually set for the cooperative with their own expectations of what the goals should be. Specific goals include a favourable price, quality service, return on equity, and several others. An index created by subtracting an ordinal ranking of expected priorities (1=important, 7=not important) from perceived priorities provides a measure of "member satisfaction."

Comparing values of the index for each goal by age group, level of off-farm income, sales level, and educational attainment provides some explanation for the extent to which cooperative member and manager objectives do not agree. In particular, younger farmers believe that their managers do not place enough emphasis on such bottom-line issues as better prices, a higher return to equity, quality of service, or product variety. However, this group believes that managers place too much importance on the social role of cooperatives and their involvement in the community. Members with different proportions of off-farm income tend to view the objectives set by management similarly—those with lower off-farm incomes tend to place higher importance on the return to equity, but this is only slight. There are sharp differences, however, between farms with less than $50,000 and those with more than $250,000 in sales. The latter group is far more critical of the objectives set by their managers in terms of price, member input, quality of service, staff expertise, product quality, value added, and particularly the return on equity. As with younger farmers, larger farmers tend to place less emphasis on the social aspects of cooperation. As the level of a farmer's education rises, he or she is less inclined to agree with cooperative management's objectives in terms of education, expertise, and customer service, but tends to align more closely with the social goals of cooperative managers.

Regression analysis largely confirms these results. By parameterizing a "cooperative benefit function," the study shows that older farmers tend to have a more favourable view of cooperative performance than do younger ones. Farmers with a higher level of education are more likely to agree with the cooperatives' non-economic objectives. Furthermore, these results show that larger farmers, when farm size is measured in terms of seeded acreage, tend to have a more pessimistic view of cooperative product variety and value.

Although the results contain some surprises, they do support some broad themes. First, problems of member dissatisfaction are more likely to arise among younger farmers as they do not associate the cooperative with the social movement that it once was. Their only contact or experience with the cooperative is on purely business terms. Second, the movement of farmers toward off-farm jobs and supplementary income does not seem to affect their perception of the quality of cooperative management very much. However, larger farmers tend to believe that cooperative management operates under a separate set of goals from their members. Reflecting their greater appreciation for the business aspect of the cooperative, the larger farmers are the ones most likely to press for change. Finally, the extent of member-manager objective disagreement tends to fall with member education in many respects, but the areas of disagreement are not entirely consistent with the greater

emphasis on economic issues that one would expect. In fact, the more educated members tend to align themselves with the social and community roles of the cooperative. Perhaps this result, more than any other, bodes well for cooperatives in the future as a more highly trained generation of farmers takes a more long-term perspective of the benefits offered by their cooperatives.

## Note

1. In the cooperative case, owner-members are principals, while the cooperative managers are agents. The principal/agent problem, therefore, describes "how the principal can best motivate the agent to perform as the principal would prefer, taking into account the difficulties in monitoring the agent's activities" (Sappington 1991).

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## Appendix

The following questions provide the raw data from which the index of cooperative member satisfaction is calculated:

**Please indicate your perception of the importance this co-op places on each of the following items:**

| | Very Important | | | | | | Not Important |
|---|---|---|---|---|---|---|---|
| a. Price of production or services | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| b. Member's input in decision-making process | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| c. Variety of products/services offered | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| d. Customer service | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| e. Professionalism/expertise of staff | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| f. Quality of products/services | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| g. Agricultural education and training | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| h. Member ownership and control in the co-op | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| i. Proximity/convenience/ease of use | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| j. Social relationships with other members | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| k. Return on equity | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| l. Community involvement | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| m. Value of products or services | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| n. Commitment to traditional cooperative ideals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Now indicate how important you feel these items should be to the co-op:**

| | Very Important | | | | | | Not Important |
|---|---|---|---|---|---|---|---|
| a. Price of products or services | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| b. Members' input in decision-making process | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| c. Variety of products/services offered | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| d. Customer service | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| e. Professionalism/expertise of staff | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| f. Quality of products/services | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| g. Agricultural education and training | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| h. Member ownership and control in the co-op | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| i. Proximity/convenience/ease of use | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| j. Social relationships with other members | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| k. Return on equity | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| l. Community involvement | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| m. Value of products or services | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| n. Commitment to traditional cooperative ideals | 1 | 2 | 3 | 4 | 5 | 6 | 7 |