

# Institutions, Contracts and Organizations

Perspectives from New Institutional Economics

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*Edited by*

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## 22. Ill-defined property rights in collective action: the case of US agricultural cooperatives

**Michael L. Cook and Constantine Iliopoulos**

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### THE COOPERATIVE INVESTMENT PROBLEM

Cooperatives are a prominent business organizational form in the world agri-food system. In Europe, cooperatives in most countries control market shares often exceeding 50 percent in numerous agri-food categories. In the United States, cooperatives market 32 percent of the commodities and products produced and processed in the agri-food chain – equivalent to more than US\$100 billion annually.

Currently, firms including cooperatives operating in the US agricultural and food industries and chains are experiencing (i) price and risk augmenting deregulation, (ii) more contractually complete vertical coordination, (iii) accelerated horizontal and vertical rationalization, and (iv) increased capital/knowledge factor intensity.

It is this increased need for equity capital that is complicating cooperative growth plans. Equity capital acquisition has long been cited as a problem for cooperatives (Hansmann 1996; Hart and Moore 1998; Olson 1971; Cook 1995). In cooperatives, member-patrons usually contribute equity capital through patronage methods rather than explicit investment methods. In the USA the actual capital acquisition method utilized is determined by the type and function of the cooperative.

Equity capital acquisition in cooperatives is viewed as a constraint because of the existence of the free-rider, horizon and portfolio problems.<sup>1</sup> These problems emerge because in most traditional cooperatives, ownership *per se* conveys no benefit; instead benefit is obtained only when members patronize the cooperative. Each of these three cooperative investment problems involve opportunistic behavior by member-patrons and their evaluation of the set of cooperative property rights adopted to address residual claim and residual rights of central issues.

The free-rider problem emerges in cooperatives in two forms: external and internal. The external free-rider constraint is a common-resource problem occurring when property rights are non-tradable, insecure, or unassigned. Cooperative property rights are not well suited and enforced to ensure that current member-patrons, or current non-member-patrons, bear the full costs of their actions and/or receive the full benefits they create. This situation occurs particularly in open membership cooperatives. An example would be when a pear producer refuses to join the membership of a pear bargaining association but captures the benefits of the negotiated terms of trade. A more complex type of free-rider problem occurs when dealing with the common property problem (or insider free-rider problem). This occurs when new members obtain the same patronage and residual rights as existing members and are entitled to the same payment per unit of patronage. This set of equally distributed rights combined with the lack of a market to establish a price for residual claims reflecting accrued and present equivalents of future earnings potential creates an intergenerational conflict. Because of the dilution of the rate of return to existing members, a disincentive is created to invest in their cooperative.

The horizon problem refers to the disincentive for cooperative members to invest in long-term projects. Benefits flowing to the patron instead of the investor is also the genesis of this cooperative investment problem. Specifically, the horizon problem occurs when a member's residual claim on the net income generated by an asset is shorter than the productive life of that asset (Porter and Scully 1987). This problem is caused by restrictions on transferability of residual claimant rights and the lack of liquidity through a secondary market for the transfer of such rights. The horizon problem creates an investment environment in which there is a disincentive for members to contribute to growth opportunities. The severity of this problem intensifies when considering investment in research and development, advertising, and other intangible assets. Consequently, there is pressure on the board of directors and management to (i) increase the proportion of the cooperative's cash flow devoted to current payments to members relative to investment, and (ii) accelerate equity redemptions at the expense of retained earnings.

We call the third cooperative investment problem the portfolio problem. The portfolio issue can be viewed from the cooperative firm's point of view as another equity acquisition problem. The lack of transferability, liquidity and appreciation mechanisms for exchange of residual claims prevents members from adjusting their cooperative asset portfolios to match their personal risk preferences. The cause of this problem is again the tied-equity issue – the investment decision is 'tied' to the patronage decision. Therefore, members hold suboptimal portfolios, and those who are forced to accept more risk than they prefer will pressure cooperative decision makers to rearrange the coop-

erative's investment portfolio, even if the **reduced risk portfolio** means lower expected returns.

Traditionally cooperatives have attempted to mitigate the investment problems by retaining earnings as member equity. But in US agricultural cooperatives, members demand that earnings retained for investment must eventually be returned to the member-patrons. Consequently, cooperative equity capital might be viewed as a form of debt. The redemption of this equity-quasi debt eventually places a burden on the cooperative's asset base and leads to slower growth. For members, this equity is usually returned at book value regardless of the value of the cooperative business itself. Hence, members do not receive a return on their investment reflecting firm growth value unless the cooperative is dissolved or sold.

## PROPOSED SOLUTIONS TO THE COOPERATIVE INVESTMENT PROBLEM

Several remedies have been proposed in the literature for solving the cooperative investment property rights problems. A closed membership policy complemented with marketing agreements<sup>2</sup> has been proposed as a solution to the free-rider issue, particularly the insider free-rider constraint (Condon 1990; Staatz 1987; Vitaliano 1983; Porter and Scully 1987). A second solution for the free-rider problem is the establishment of a secondary market for cooperative shares. Transferable and appreciable shares would ensure existing members of the ability to capture the full value of their investment in the cooperative and, thus, create an incentive to invest in their organizations, since the fear that new members would also share future earnings associated with their investment is eliminated.

The existence of a secondary market for cooperative shares has also been proposed as an important prerequisite in dealing with the horizon and portfolio problems. When shares are transferable and appreciable, inactive members and members near the end of their patronage horizon possess the ability to retrieve a portion of their equity capital through the sale of their equity stock. That is, the present value of the cooperative's estimated future income stream becomes capitalized into the value of the stock<sup>3</sup> or delivery right.

Additionally, transferability and appreciability of cooperative shares enables members to match their individual risk preferences to the risk associated with the cooperative investment portfolio and thus ameliorate the portfolio constraint. The adoption of an equity redemption plan<sup>4</sup> with short revolving periods has also been suggested as a remedy to the horizon problem (Cook 1995; Staatz 1987). Finally, separate capital pools,<sup>5</sup> adopted by multipurpose cooperatives, allow members to assume a level of risk as close to what they



prefer as possible and thus are hypothesized to correct for the portfolio problem.

Since 1990 a new form of agricultural cooperative has been emerging, whose growth has been explosive (Harris et al. 1996). The difference between the 'new generation' cooperative and the traditional cooperative is in the property rights structure. The new generation cooperative has a more clearly defined membership policy (closed, or well defined), a secondary market for members' residual claims, patronage and residual claimant status restrictions, and enforceable member precommitment mechanisms. This is in contrast to the traditional cooperatives described above, whose property rights structure is characterized by open membership, capital generated by earnings from patronage, and illiquid ownership rights.

Our empirical objective is to explore the impacts that property rights modifications might have on the incentive for a member-patron to invest in his/her cooperative. The hypothesis tested in the empirical model is:

Characteristics in a well-defined property rights structured cooperative such as closed membership, obligatory member commitment, and transferable and appreciable equity instruments would result in greater incentives to invest in a cooperative than ill-defined property right policies such as traditional cooperatives characterized by open membership, voluntary member commitment, non-transferable and non-appreciable equity instruments, and no formal short-term equity redemption plan.

## EMPIRICAL TESTING – METHODOLOGY

To identify which of the aforementioned policies have a significant impact on the investment incentives of members, a structural equation model was estimated based on Figure 22.1, which summarizes the main hypothesis.

The independent exogenous variables on the left-hand side of the figure are: (i) membership policy (*MEMBPOL*): whether the cooperative has an open or defined membership policy; (ii) marketing agreement (*MKTGAGR*): whether members sign a marketing agreement or not; (iii) transferable delivery rights (*TRANSFER*); (iv) appreciable delivery rights (*APPREC*); (v) equity redemption plan (*EQREDPL*): whether the cooperative returns members' equity capital in a structured program; and (vi) separate capital pools (*SEPKPOOL*): whether the equity capital of the various subgroups of members is allotted to non-netting separate control and monitoring accounts.

'Members' investment incentives' is a latent variable measured by two solvency ratios: (i) *IPM* indicates investment per member defined as a modified ratio of members' equity to the number of members, and (ii) *OWNERS*,

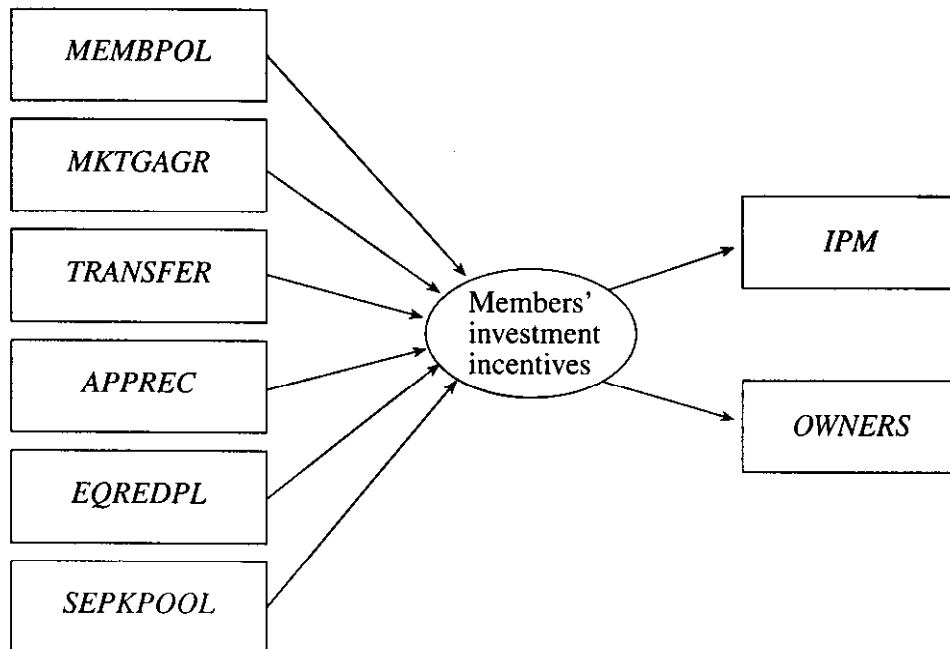


Figure 22.1 Investment property rights constraints in US agricultural cooperatives: the path diagram

indicates the ownership ratio, calculated by dividing members' equity by total cooperative assets. These ratios were calculated by the officially audited financial reports of 127 cooperatives representing more than 75 percent of the total 1996 gross sales by US agricultural cooperatives (Farmer Cooperative Statistics). The other relevant solvency ratio examined was the term debt to fixed assets ratio<sup>6</sup> (CoBank). However, none of the calculated correlations between this ratio and the observed variables exceeded  $\pm 0.002$ . Hence only *IPM* and *OWNERS* are used as indicators of members' investment incentives. Since the data analysed focus exclusively on internally generated risk capital, the problem of accounting for investment incentives provided to outside investors is not considered to be serious.<sup>7</sup>

A dual-response<sup>8</sup> mail survey was used to gather data on cooperative organizational characteristics and policies. The targetted sample of US agricultural cooperatives included the population of Sapiro II, Sapiro III and Nourse II cooperatives and one hundred Nourse I cooperatives.<sup>9</sup> As mentioned earlier, the chosen sample represented more than 75 percent of the total 1996 gross sales by US agricultural cooperatives. The choice of this sample was based on three criteria: (i) it is representative of US agricultural cooperatives; (ii) it includes both traditional and new forms of collective action; and (iii) it is substantial, so that statistical inference is accommodated.

Of the 200 cooperatives meeting the aforementioned set of criteria, the dual response rate was 63.5 percent (127 cooperatives) when both respondents participated completely.

Before constructing the path diagram, the nature of causality between the variables was determined. The approach to satisfying the three necessary conditions for establishing causality (i) pseudo-isolation, (ii) association, and (iii) direction of causality was to include in the model all exogenous variables theoretically justified and then test for association and direction of causality. During this process, the data indicated that only those cooperatives allowing transferability of delivery rights had delivery rights with the potential to appreciate/depreciate. Therefore, these two variables were treated as a single variable (*TRANSFER*) to minimize multicollinearity problems. Also, since it was expected that the errors in independent variables would be highly correlated, a structural equation model was preferred to simple regression techniques because of its ability to deal with the existence of such correlation and provide robust estimates of the underlying relationships.

The associations between independent and dependent variables were tested by means of calculating the tetrachoric correlations between dichotomous variables and biserial correlation between dichotomous and continuous (*IPM*, *OWNERS*) variables (Bollen 1989). The obtained correlation matrix indicated a very weak association between *EQREDPL* and all other variables in the model. *SEPKPOOL* was significant, but only at the 0.1 level.

Direction of causality was established based on temporal priority. That is, all exogenous independent variables (*X*'s) are cause indicators of the latent variable, members' investment incentives, rather than effect indicators.

Subsequently, the path diagram of causal relationships was converted into the following equations:

$$\eta = \Gamma x + \zeta \quad (22.1)$$

$$\gamma = \Lambda_\gamma \eta + \varepsilon \quad (22.2)$$

where  $\eta$  is the  $1 \times 1$  matrix of endogenous dependent latent variables (members' investment incentives);  $\Gamma$  is the  $1 \times 4$  matrix of coefficients linking the exogenous observed variables to the latent variable;  $x$  is the  $4 \times 1$  matrix of exogenous observed variables;  $\zeta$  is the  $1 \times 1$  matrix of the error in latent variable;  $\gamma$  is the  $1 \times 2$  matrix of endogenous observed indicators (*IPM* and *OWNERS*) of the latent variable  $\eta$ ;  $\Lambda_\gamma$  is the  $1 \times 2$  matrix that contains the coefficients linking the latent variable to its indicators; and  $\varepsilon$  is the  $1 \times 2$  matrix of the errors in measuring the observed endogenous variables.

Four additional matrices needed to be defined before the model was fully specified.  $\Theta_\varepsilon$  is the  $2 \times 2$  matrix of prediction errors for indicators of endog-

enous constructs, with only one non-zero element in this case.  $\Theta_{\sigma}$  is the  $4 \times 4$  matrix of prediction errors for the cause indicators of the latent variable.  $\Phi$  is the matrix of correlations among exogenous latent variables, which in this model has all its elements equal to zero, since no exogenous latent variable is included in the model. Finally,  $\Psi$  is the  $1 \times 1$  matrix of correlations between endogenous latent variables; in this case, it has only one element,  $\Psi = \text{Var}(\zeta)$ . This model was used to estimate all coefficients.<sup>10</sup>

The software PRELIS 2.0<sup>®</sup> was used to inspect continuous variables for outliers and no outliers were found.<sup>11</sup> Furthermore, the data on the continuous variables (*IPM* and *OWNERS*) were inspected for divergence from normality, and excessive kurtosis and skewness. Both *IPM* and *OWNERS* were found to have negative skewness and kurtosis. In such cases, a logarithmic transformation of the variable may solve the problem. After the transformation both variables approximated the normal distribution; *IPM* at the 0.05 level of significance, and *OWNERS* at the 0.1 level of significance.

The correlation matrix of all observed variables was used as input for estimating the model. However, since all exogenous observed variables (*X*'s) are dichotomous variables, the Pearson product-moment correlation is inappropriate (Hair et al. 1995) To allow for incorporation of the non-metric measures into the structural model, different types of correlations were calculated. When both variables were dichotomous (for example *MEMBPOL* and *TRANSFER*), the tetrachoric correlation between these variables was calculated. When one variable was dichotomous, while the other was continuous, the biserial correlation of the variables was computed.

LISREL 8.0, Interactive for Windows<sup>®</sup> was the software used for estimating the model. When non-normality threatens the validity of the widely used maximum likelihood estimator, it is more appropriate to employ an alternative estimator that allows for non-normality and is asymptotically efficient (Bollen 1989). The weighted least squares (WLS) estimator was used. The major advantage of the WLS estimator is that it does not assume that variables are multnormally distributed, a condition necessary for using any of the maximum likelihood, generalized least squares, or unweighted least squares.

The model was then identified (that is, examined for positive degrees of freedom):

$$\text{d.f.} = \frac{1}{2} (p + q) (p + q + 1) - t = \frac{1}{2} (4 + 2) (4 + 2 + 1) - 16 = 5,$$

where, *p* and *q* are the number of independent and dependent observed variables, respectively, and *t* is the number of parameters to be estimated.<sup>12</sup> The paths from the latent variable to its indicators have been set to one, under the assumption that the two dependent observed variables are reasonably

accurate indicators of members' investment incentives. All other parameters were estimated within the model. The obtained results are shown in the path diagram (Figure 22.2). A more detailed presentation of the estimates is included in Table 22.1; no offending estimates were obtained from the model estimation.

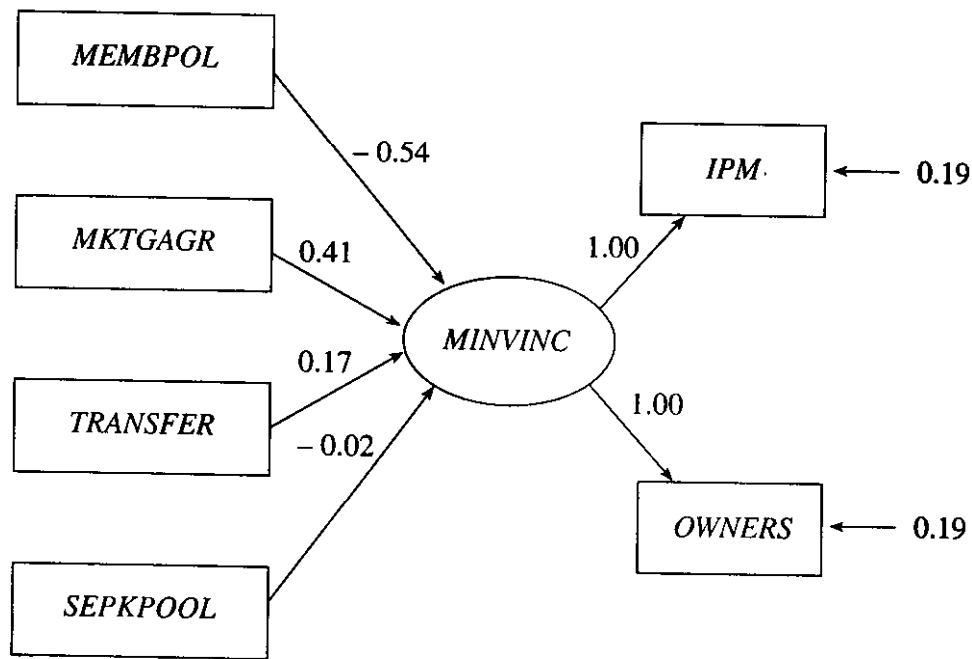


Figure 22.2 Investment property rights constraints in US agricultural cooperatives: path diagram with estimated coefficients

Table 22.1 Investment property rights constraints model (WLS estimates)

Parameter	Coefficient estimate	Std error	t-value
$\gamma_{11}$	-0.54	0.13	-4.18
$\gamma_{12}$	0.41	0.15	2.81
$\gamma_{13}$	0.17	0.11	1.52
$\gamma_{14}$	-0.02	0.07	-0.36
$\gamma_{11}$	1.00*	-	-
$\gamma_{12}$	1.00*	-	-

Notes:

$X^2 = 9.38$ ,  $X^2$  Critical = 11.070 (5%); d.f. = 5; P = 0.09467; RMSEA = 0.083.

\* Parameters constrained through normalization.

Table 22.2 Goodness-of-fit measures for investment property rights constraints model ( $H_1$ )

Goodness-of-fit measures	Acceptable range
<i>Measures of absolute fit</i>	
Chi-square ( $\chi^2$ ) statistic = 9.38 (5 d.f.)	Less than 11.07 (at 0.05 level of significance)
Goodness-of-fit index (GFI) = 0.9972	As close to 1.00 as possible
Adjusted GFI = 0.9883	As close to 1.00 as possible
RMSEA = 0.08	0.05–0.08
<i>Measures of incremental fit</i>	
AGFI = 0.9883	As close to 1.00 as possible
Normed fit index = 0.9972	As close to 1.00 as possible

Measures of absolute and incremental fit for the estimated model are reported in Table 22.2.

### Interpretation of the Results

The obtained results<sup>13</sup> and the assessment of the fit of the model suggest that the property rights structure of US agricultural cooperatives significantly affects members' incentive to invest in their organizations. The adopted membership policy has the most influence on members' investment incentives. The dichotomous variable *MEMBPOL* takes the value zero for cooperatives with a defined, or closed, membership policy, and the value 1.0 for cooperatives with an open membership policy. The estimated coefficient of  $-0.54$ , connecting *MEMBPOL* to *MINVINC*, indicates that, *ceteris paribus*, 54 percent of the variation in members' investment incentives can be attributed to variation in *MEMBPOL*. Consequently, variation in the measurable indicators of members' investment incentives can also be explained, since their coefficients have been normalized, and no indirect effects between variables have been assumed. Similarly, 41 percent of the variation in members' investment incentives is attributable to variation in members' commitment to the cooperative through an enforceable marketing agreement. As can be seen in Table 22.1, the estimates for *MEMBPOL* (adopted membership policy) and *MKTGAGR* (adoption of marketing agreements between the cooperative and its members) are highly significant at the 0.05 level. However, *TRANSFER* (whether the cooperative has transferable and appreciable shares or delivery rights) is significant only at the 0.1 level.

The relatively high percentage of variance in members' investment incentives attributed to variance in the adopted membership policy justifies further discussion of this result. The single most important aspect of a closed membership cooperative is that its Board of Directors<sup>14</sup> has a high degree of control over the volume of the commodity supplied by members.<sup>15</sup> Control of supply has been discussed in the cooperative literature as an important determinant of success in management's ability to develop and implement an effective strategic plan that would increase the profitability of the cooperative firm (for example, Hansmann 1996; Cook and Iliopoulos 1998). Additionally, control of supply has been proposed as a significant determinant of success in cooperative operational policies' effort to coordinate the combined productive endeavors of the cooperative and its members' individual businesses (for example, van Wassenae 1989).

Marketing agreements are also an important means of achieving the aforementioned goals of control of supply and coordination. The difference between the estimates of these two property rights characteristics may arise because of their different natures. That is, a closed membership policy does not require the commitment of members' resources to the cooperative goal,<sup>16</sup> at least to the extent of a marketing agreement. Marketing agreements usually require that a member supply the cooperative for one or more seasons with a specific quantity of a commodity. Cooperatives that use marketing agreements also use severe penalties for members unable or unwilling to fulfill the prespecified terms of the agreement. Therefore, members may prefer closed membership to a marketing agreement as a mechanism for controlling supply and thus ameliorating the negative impact of the free-rider constraint. Additionally, marketing agreements, especially in cooperatives with a small number of members, can seriously threaten trust between members and the cooperative and, thus, some cooperatives may not use marketing agreements, even if they are effective mechanisms for achieving control of supply and coordination (Hansmann 1996).

While membership policy and marketing agreements refer to members' commitment, the third independent variable (*TRANSFER*) is associated with another important issue. Transferability and appreciability of cooperative equity shares, or delivery rights, are responsible for creating a semi-liquid secondary market for the cooperative's stock. In the empirical analysis, these two property rights characteristics are also proved to be important tools for ameliorating the horizon problem. On the other hand, equity redemption plans do not significantly affect members' investment incentives probably because while they may succeed in aligning user and benefactor rights for investments that pay back within the membership horizons of current members, they fail to do so for long-term investments (for example, in intangible assets). Additionally, the effectiveness of equity redemption plans is deter-

mined by conditions highly dependent upon exogenous events such as changes in the macroeconomic environment and the particular characteristics of an industry which may seriously affect a cooperative's ability to return members' equity in good time.

An alternative explanation of the low importance of equity redemption plans in the model is derived from the nature of the horizon constraint, which does not arise for investments that pay off in the period in which their costs are incurred. For such investments, an ownership structure characterized by benefits accruing to members in proportion to patronage and revolving equity is optimal.<sup>17</sup> Equity redemption plans, however, may fail to be part of the solution for investments that pay off after their costs have been incurred (for example, investments in intangible assets such as advertising or R&D). In this case members, especially if they plan to reduce their share of the cooperative's patronage (for example, they plan to retire) before the investment in an asset has paid off, are faced with an investment disincentive. On the other hand, transferable and appreciable shares provide a more effective solution to the horizon problem, since members can capture in the market the value of any type of investment they made in the cooperative (van Wassenaeer 1989, p. III-6).

Additionally, transferable and appreciable shares offer another way to deal with the portfolio problem. Members' incentives to invest in their cooperative are enhanced when they can choose the level of risk they assume. Therefore, the importance of this variable in the model reveals not only its relevance in solving the free-rider and horizon problems but also in ameliorating the portfolio constraint. Another hypothesized solution to the portfolio constraint was the adoption of separate capital pools. However, the impact of this variable was found insignificant. Since only a few cooperatives in the sample had adopted separate capital pools, their positive effects might not have been detected in the model. Alternatively, another explanation may involve the fact that separate capital pools are a relatively new accounting method for enhancing balance among users, owners and benefactors in cooperatives. Thus it could be assumed that, as a new method, it has not yet demonstrated its positive impact on members' investment incentives or that cooperatives do not make full use of its inherent advantages. Further investigation of the issues pertaining to the portfolio constraint, and more specifically to the adoption of separate capital pools, is fully justified and is reported in forthcoming publications.

## CONCLUSION

We could simplistically summarize our results in the following manner. Suppose that cooperatives in the sample had to choose either to invest in a new,



highly rational, project or not. Suppose further that the members' investment incentive takes only two values: they are either *willing* to invest, or *not willing* to invest. Then, members of those cooperatives which have a closed membership policy, use marketing agreements, and have transferable and appreciable delivery rights, would choose to invest in the project. The members of open membership cooperatives, with no marketing agreements and, non-transferable and non-appreciable shares would not invest in the new project, or would be much less so inclined. Consequently, the transaction costs of equity acquisition would be significantly higher for the latter type of cooperatives. In other words, clarifying property rights leads to the increased probability of creating investment incentives. And while the significance of clearly defined property rights is well established for investor-oriented firms, the point of our chapter is that the same holds true for the alternative ownership structures examined in this study.

## NOTES

1. For an in-depth theoretical and empirical analysis of the three vaguely defined property rights, the reader is referred to Constantine Iliopoulos (1998), 'A study of the property rights constraints in US agricultural cooperatives: theory and evidence', Unpublished PhD Dissertation, University of Missouri-Columbia.
2. Marketing agreements are contracts between individual members and the cooperative, used in marketing cooperatives, to specify the volume and the quality of the commodity supplied by each member to the cooperative.
3. In the emerging new form of cooperatives (new generation cooperatives) stock and delivery rights are used interchangeably.
4. Equity redemption plans are ways in which the cooperative returns to its members the amount they have invested. While several methods for evolving members' equity exist, the base capital plan method is the most effective in returning members' equity in good time. Cooperatives adopting a base capital plan determine a member's equity obligation annually based on the cooperative's need for capital and on the member's use of the cooperative. Underinvested members continue to invest, while overinvested members generally begin to receive redemption of their excess investment.
5. In multipurpose cooperatives adopting a single capital pool, members' equity and leverage (debt) capacity are pooled together. This results in some members' equity used to subsidize investments that do not benefit them. As a result, members' willingness to invest in the cooperative is decreased.
6. The term debt to assets ratio measures the relationship between long-term debt and fixed assets. It indicates whether term debt has been repaid in accordance with the expected life of fixed assets.
7. Another abstraction from reality is the implicit assumption that cooperative members are relatively homogeneous and thus IPM accurately represents the average of members' investment in the cooperative.
8. Two questionnaires were mailed to each cooperative firm: one to be answered by the Chief Executive Officer and the other by the Chief Financial Officer. The former provided information on organizational and policy issues while the latter answered questions regarding the financial policies of the cooperative.
9. Cook describes a taxonomy of cooperatives, of which four types are of relevance for this study: (i) the Nourse I local multipurpose cooperatives, (ii) the Nourse II regional multi-

- purpose cooperatives formed by local cooperatives, (iii) Sapiro II processing and/or marketing cooperatives, and (iv) Sapiro III, or new generation marketing cooperatives. The names of these cooperatives were chosen in order to indicate their founding motive. Nourse cooperatives were founded by farmers adapting Nourse's philosophy of ameliorating market failures – often called the 'competitive yardstick' school of cooperation. On the other hand, Sapiro cooperatives adapted the organizational strategies proposed by Sapiro – in order to extract rents downstream in the food chain.
10. In this step the validity and reliability of indicators were also established. Space considerations preclude the discussion of these issues.
  11. PRELIS 2.0 was used to create a scatterplot of *IPM* against *OWNERS*, and visual inspection for outliers was performed.
  12. The parameters to be estimated include the correlations between the measurement errors of the observed independent variables but do not include the coefficients that have been normalized.
  13. It should be noted that the obtained results are not deterministic; they indicate trends and causal directions, rather than accurate measurements of the strength of relationships.
  14. Or the founding coalition of members in the case of emerging Sapiro III cooperatives.
  15. While the discussion focusses on marketing cooperatives, it can easily be extended to supply cooperatives. In supply cooperatives, it is rather an issue of control of members' demand for one or more agricultural supplies, than an issue of supply control.
  16. Unless, of course, a significant up-front equity capital investment is required.
  17. In the sense that it does not create investment disincentives for members.

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