Strategic Alliance and Joint Venture Agreements in Grain Marketing Cooperatives

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Strategic alliance and joint venture agreements are analyzed using the prisoners' dilemma and assurance problem models of game theory. Hypotheses regarding the factors contributing to the success/failure of the agreements are formulated. These hypotheses are confirmed with data from interviews with managers of grain marketing cooperatives in eastern Colorado. Our results suggest that joint venture and strategic alliance agreements represent an opportunity for local cooperatives to take advantage of size economies while maintaining their individual business identities. Successful agreements require not only attention to the financial and operational components but diligence in the interpersonal dynamics of trust, commitment, and open communication.

I. Introduction

Since the early 1980s there has been increased consolidation of cooperative businesses as a result of reorganization in the form of mergers, acquisitions, and consolidations. The grain marketing industry provides a good example of business consolidation of cooperatives as a result of reorganization at the national and local levels. The number of regional and inter-regional grain cooperatives in the United States declined from sixteen to nine during the 1980s as a result of two mergers[1], one acquisition[2], and the assets of four cooperatives being dissolved[3]. In addition, several regional cooperatives explored but did not follow through with merger agreements[4].

At the local level, consolidation of cooperatives has also been prevalent with mergers or closings of local cooperatives in the federated structure and the closing of local facilities in the centralized structure. In the United States, the number of local grain marketing cooperatives declined by 25.2 percent, while the total storage capacity of local grain cooperatives increased by 28.7 percent from 1980 to 1991 (Hunley and Cummins 1993). In the Canadian grain marketing cooperative system, organized according to a centralized structure, there has been a continuous decline in the number of country elevator operating units.[5]

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In virtually all of the cases where cooperative reorganization has occurred, the challenge for managers and directors has been to achieve the necessary economies of size in their operations and maintain the commitment and patronage of their members. Examples of size economies for locally owned agricultural cooperatives include: grain elevators receiving significant freight advantage when they can handle unit trains, farm supply cooperatives receiving volume discounts on input purchases, and decreased average costs for the storage and delivery of petroleum and fertilizer products.

Recently, local cooperatives have employed joint venture and strategic alliance agreements as an alternative to mergers or consolidations. Joint ventures and strategic alliances allow the local cooperatives to preserve their status as separate business entities and, therefore, the loyalty and commitment of their members[6]. At the same time, these renewable business agreements allow two or more cooperatives to combine critical aspects of operation to achieve the efficiencies associated with size economies.

The general objectives of this paper are to describe the nature of joint venture and strategic alliance agreements that local cooperatives are adopting in response to today's changing business environment, to analyze the agreements with respect to economic and cooperative theory, and to explore the factors that contribute to the success or failure of the agreements.

In the following section of this paper we review the literature on reorganizations, joint ventures, and strategic alliances as relevant for cooperatives. A discussion of game theory and expected outcomes for joint venture and strategic alliance agreements follows in section III. Our hypotheses are developed in the fourth section. The interview process is described, along with an overview of the respondents, in the fifth section. The results of the interviews are presented in the sixth and seventh sections. In particular, the benefits of the agreements and the factors that contribute to the success and/or failure of the agreements are discussed in reference to the hypotheses. The final section of the paper concludes with suggestions for cooperative agreements and further study.

II. Previous Research

The impetus for reorganization of cooperative operations at the local level has most often been the expectation of improved efficiency and financial performance of the business. Research considering the effect of mergers of locally owned cooperatives sheds some light on this issue. Parliament and Taitt (1989) examined twenty-four reorganizations (mergers, consolidations, and acquisitions) involving local cooperatives in Minnesota and evaluated the financial consequences of the reorganizations. Their results "indicate that anticipated financial benefits may not materialize after reorganization in both the short and long run" (Parliament and Taitt 1989, 22) and suggest that managers should approach reorganizations with caution.

Their recommendation of caution is based on mixed results concerning the effectiveness of reorganizations. In 8 percent of the cases, they found that the post-reorganization profitability ratio was worse than the pre-reorganization profitability ratio for all of the original participants. In another 8 percent of the cases another reorganization had occurred within six years of the reorganization. The post-reorganization profitability ratio was better than the pre-reorganization profitability ratio for one of the participants but worse than the pre-reorganization

profitability ratio for another of the participants in 25 percent of the cases. Parliament and Taitt did, however, find that in 33 percent of the cases the reorganization was an unqualified success, with the post-reorganization profitability ratio for the new business being stronger than the profitability ratio for all of the participants prior to the reorganization. These "success rates" do support the idea that size economies may be difficult for local cooperatives to achieve and, therefore, represent a challenge for managers of local cooperatives.

An additional point that discourages many directors and managers in local cooperatives from pursuing mergers, even though a merger may improve efficiency and financial return, is that the membership desires a cooperative that is locally owned and not one that is a branch office of the cooperative "down the road." As Reynolds (1995) notes: "Members who prefer smaller, more localized cooperatives value their familiarity and acquaintance with the membership—a condition which is often diminished by consolidation with a cooperative outside their community" (Reynolds 1995, 14).

Although many cooperatives have successfully increased their efficiency through mergers and consolidations, recently cooperatives have been exploring the use of joint venture and strategic alliance agreements instead. As an alternative strategy, these new business arrangements allow each of the cooperatives involved to achieve efficiencies through size economies while maintaining their respective identities.

Liebrand and Spatz (1994) describe how a particular type of joint venture, marketing agencies in common (MACs), can "capitalize on economies of size while allowing member cooperatives to maintain operational independence" (Liebrand and Spatz 1994, 11). In particular, MACs allow cooperatives to collectively share marketing costs, diversify product lines, and increase sales volume. The benefits of these actions are increased economic efficiency and an expanded customer base. Liebrand and Spatz (1994) identified that the factors contributing to the success of MACs are:

1. hiring experienced marketing and sales staff,
2. establishing MAC agreements that give decision makers the autonomy to make strategic decisions as needed without having to confirm decisions with participating cooperatives,
3. marketing a wide selection of products through the MAC, and
4. pooling expenses and services to achieve economic efficiencies.

Reynolds (1995) describes specialization networks that allow cooperatives to remain competitive in the business environment while maintaining individual identity as a cooperative organization. Networking allows the cooperatives to expand markets, increase productivity, and establish long-term market positions while avoiding merger or consolidation. This is a likable alternative for local cooperatives hesitant to merge. Reynolds (1995) points out that flexibility is one of the distinct advantages of specialization networks. When the networks come up for renewal the cooperatives may decide to renew the network if it has been working well, revert to the original status of the cooperatives acting independently, or merge or consolidate the cooperative operations. Reynolds (1995) notes that in the cases where mergers or consolidations do result, the experience with a network often eases the transition for members and managers.

III. Non-cooperative Game Theory and Cooperative Business Arrangements

The establishment and operation of strategic alliance and joint venture agreements can be thought of as two or more cooperative businesses entering into collective action arrangements. The game theory literature provides useful insights on how and when these arrangements will be successful.

The decision to enter and, in particular, maintain a cooperative business arrangement can be likened to a multi-period, non-cooperative game theory decision since different payoffs are associated with agents deciding to *cooperate* or *defect* in the collective action. We focus on the aspect of non-cooperative game theory where the participants in the game communicate with each other, but are then able to change their minds when returning to their home cooperatives to make actual business decisions regarding the joint venture or strategic alliance.

Joint venture and strategic alliance agreements differ from mergers, consolidations, and acquisitions since the former involve separate business units that have decision makers who can either act in a manner that is mutually beneficial to all businesses or make individualistic decisions. Following a merger, consolidation, or acquisition, however, one business entity results, and the decision makers act in the best interest of the new singular business.

Taylor (1987) suggests that three general game forms are useful when characterizing collective action arrangements. In addition to the prisoners' dilemma game that is commonly considered, he identifies the chicken game and the assurance problem[7].

Consistent with most presentations of game theory we examine a game form with two players each having two actions to choose from. The two choices that each player faces are whether to *cooperate* with the other player in the business agreement or to *defect* and "do your own thing." The prisoners' dilemma game is characterized by each player having a dominant strategy to *defect*. However, the *defect/defect* outcome leaves both players worse off than if the *cooperate/cooperate* outcome had been selected. Joint marketing agreements may be appropriately described by the prisoners' dilemma game. While the dominant strategy for each manager is to market the product individually, both businesses are better off when they commit to the joint marketing agreement.

The assurance problem, sometimes referred to as the "battle of the sexes game," is characterized by each player being willing to cooperate only if the other player cooperates (Taylor 1987). An assurance problem example relating to strategic alliances among local cooperatives is the joint purchase of inputs to achieve the advantages of volume discounts. It is in the best interests of both cooperatives to participate in the joint purchase, but they must coordinate efforts and get together. To summarize, joint ventures and strategic alliances will be successful in the long term when conditions can be set in place that provide incentives for the players to select the *cooperate* action rather than to *defect*.

In the remainder of this section we explore the factors that affect *cooperate* and *defect* outcomes for the prisoners' dilemma and the assurance problem game forms. The single-period prisoners' dilemma game leads to the dominant strategy equilibrium of *defect/defect*. However, if the prisoners' dilemma game is infinitely repeated, thus becoming a supergame, the possibility for the *cooperate/cooperate* outcome arises. In referencing the work by Taylor (1976), Schotter (1981), and Axelrod

and Hamilton (1981) on supergames, Staatz (1987) notes the following five factors hat influence the outcome of the prisoners' dilemma supergame:

1. the length of the supergame (the supergame must be of infinite duration or at least of a duration unknown in advance to the players),
2. the reaction of the players to a defection by one of their number,
3. the rates of time preference by the players,
4. the relative size of the payoffs for defection and cooperation in the constituent game, and
5. the number of players in the game (Staatz 1987, 130).

Given the different payoff structure, the assurance problem game form is more likely to result in the *cooperate/cooperate* outcome. However, the chance of achieving the *cooperate/cooperate* outcome in the assurance problem is greater when the following conditions exist:

6. the players are able to communicate with each other, and
7. the players trust each other.

IV. Hypotheses

Using the above economic theory on repeated prisoners' dilemma and assurance problem game forms, we formulate the following hypotheses concerning the success or failure of cooperative business arrangements. Joint venture and strategic alliance agreements will be more successful when:

1. the cooperatives are committed to working together in the long term,
2. managers who defect from an arrangement are punished according to guidelines in a contract or through the negative image they receive in the business community,
3. all of the cooperative businesses involved are financially sound,
4. the benefits/costs of *cooperating/not cooperating* are well known to all participants, and the payoff for cooperation is larger than the payoff for not cooperating,
5. the number of cooperatives involved is smaller, and the cooperatives are homogenous,
6. the managers each remain informed about the operations of the business arrangement and have an open line of communication with each other, and
7. the managers of the cooperatives have a sense of mutual respect and trust for each other.

Just as the supergame form of the prisoners' dilemma may yield the *cooperate/cooperate* outcome when played over an infinite time horizon, we hypothesize that business arrangements will be more successful when the cooperatives are interested in the arrangements for the long term. The *cooperate/cooperate* outcome can persist only in the multi-period prisoners' dilemma game when there is a perceived and real penalty for players who *defect*. We suggest that, in the case of business agreements, the penalty may follow from the contractual agreement or unfavorable image in the business community. It has been shown that, in the multi-period prisoners' dilemma game, players with a high discount rate have a greater tendency to defect than players with a low discount rate. It is our conjecture that financially sound business partners have similar, low discount rates and are, therefore, more likely to enjoy a successful business arrangement.

We suggest that the benefits of cooperating through the joint venture or strategic alliance include capturing size economies and being able to afford technical expertise, while the long-term cost of cooperating is the threat of going out of business. These benefits and costs must be known to all decision makers. Fewer, homogenous players are more likely to result in the *cooperate/cooperate* outcome in the prisoners' dilemma game and also in a successful business arrangement. Open communication and trust are keys to the *cooperate/cooperate* solution in the assurance problem since the payoffs to the two players are greatest when the players choose the same action. Similarly, since many of the business arrangements resemble an assurance problem, we suggest that open communication and mutual respect and trust among the managers are keys to success.

V. Interview Process and Description of Respondents

The data were collected by in-person interviews with general managers of grain marketing cooperatives located in eastern Colorado. The sample included the entire population, all twenty grain handling operations that are organized as cooperatives in eastern Colorado. In three cases, the general manager and the grain marketing specialist participated in the interview. The geographical dispersion of participants allowed for three interviews per day, on average, with the interviews conducted over eight days during the first two weeks of January 1995. The same interviewers were used at each location using a standard questionnaire[8], which minimized interviewer bias. Interviews lasted from forty-five minutes to one hour and thirty minutes.

All cooperatives are involved in grain marketing, and some also deal in farm supplies such as fuel, fertilizer, chemicals, and tires. Tables 1 and 2 report selected statistics for the cooperatives interviewed. Table 1 shows average sales figures for different business segments of the cooperative. Grain marketing and handling was categorized as the primary business segment by fifteen of the twenty cooperatives.

As revealed in table 2, all cooperatives are well established with a range of thirty-eight to ninety years in business. Total cooperative membership ranged from 270 to eight thousand members. Typically, about one-half of the members are active, in the sense of having done business with the cooperative during the past year. Non-member business accounts for about one-quarter of the cooperatives' sales on average. Several managers noted the difficulty of achieving partici-

TABLE 1. Sales by Business Segment for the Cooperatives Interviewed.

Business Segment	Range of Sales *millions of dollars*	Average Sales *millions of dollars*
Grain Marketing and Handling (17)[1]	2.7 - 43.0	11.2
Feed and Feed Processing (6)	0.8 - 1.7	1.1
Petroleum (3)	2.5 - 21.2	11.2
Fertilizer and Chemicals (4)	1.0 - 10.0	6.3
Supplies and Other[2] (6)	.5 - 6.0	2.6
All Segments (20)	2.5 - 53.0	17.5

[1]Numbers in parentheses indicate number of respondents that have reported sales in the category. Note that even though all of the cooperatives were involved in grain marketing, some of them did not separate their sales by that category.
[2]Supplies and Other includes agricultural supplies, garage services, tires, etc.

TABLE 2. Selected Statistics of the Cooperatives Interviewed.

Statistic	Range	Average
Number of Years in Business	38 - 90	70
Number of Total Members	270 - 8,000	1,325
Number of Voting Members	270 - 1,800	807
Percentage of Members Active	20 percent - 86 percent	50 percent
Percentage of Non-member Business	5 percent - 45 percent	24 percent
Grain Storage Capacity (bushels)	90,000 - 6,700,000	2,440,000
Grain Inventory Turnover	.77 - 2.88	1.4

patory democracy since it is primarily older members that attend and participate in the annual meetings.

Grain storage capacities for the cooperatives ranged from ninety thousand bushels to 6.7 million bushels with an average of 2.44 million bushels. For the 1994 crop year, eastern Colorado cooperatives operated with an average inventory turnover of 1.4. Operations dealing with both wheat and corn had inventory turnovers as high as 2.88, indicating attention to inventory management.

The Colorado cooperatives, with an average of 807 voting members per organization, are slightly smaller than the 1993 U.S. average of 948 members per cooperative[9] (Richardson et al. 1994). In terms of total gross business volume, the Colorado cooperatives compare to the 1993 U.S. average of $23 million with $17.5 million in sales per business.

The nature of agricultural production in eastern Colorado includes a variety of crops[10] and extensive animal agriculture[11] (Feuz 1990). The large diversity in crop and animal production creates a complex business environment for managers. In addition, the ongoing industrialization of agriculture requires increasing levels of expertise to meet specialized needs of growing large-scale operations. Economies of size in purchasing, warehousing, and transportation are extremely important for the survival of businesses. These trends are reflected in the types of agreements general managers talked about during the interviews.

VI. Types of Business Arrangements

The joint venture and strategic alliance arrangements in which local cooperatives in eastern Colorado are involved are summarized in table 3. We separate the arrangements into four categories[12]. Arrangements that increase economic efficiency due to size economies are listed in the first column. The second column reports agreements that contribute to effective inventory management. Investments that represent vertical and horizontal integration for the cooperatives are summarized in the third column, and arrangements that allow the cooperative to take advantage of technical expertise are listed in the last column.

Increased efficiency resulting from size economies is a common reason for cooperatives to enter into joint venture and strategic alliance agreements as observed in the first column of table 3. Managers reported that, for many operations, their businesses were not large enough to operate independently and efficiently. Although many of the cooperatives are not large enough to obtain volume discounts on input purchases, they can realize the lower prices when they combine with other cooperatives to purchase items such as fertilizer, fuel, and chemicals jointly.

TABLE 3. Business Arrangements Among and Between Cooperatives in Eastern Colorado.

Economies of Size	Inventory Management	Investment Portfolio	Technical Expertise
• Joint purchase of inputs to achieve volume discounts on: - fertilizer - diesel, petroleum - fence posts	• Exchange of products, at cost, between cooperatives to meet member needs and control inventory costs	• Investment in the following types of businesses organized as either cooperatives or LLCs: - convenience stores - tire centers - integrated hog operations - grain elevators - other storage facilities - processing plants	• Share an employee who monitors OSHA and EPA compliance issues
• Joint marketing arrangement to achieve efficiencies when negotiating rail transportation	• Storage of each other's grain on an as-needed basis		• Joint ownership of a commodity brokerage company that promotes member education on grain marketing and risk management
• Joint service arrangement to offer members custom fertilizer application	• Joint ownership of central grain storage facilities		• Take advantage of the services provided by regionals including: - coordination of transportation with the railroads - market surveys
• Joint processing agreement for efficient use of: - feedmills - bean cleaning and bagging			
• Joint ownership of large centralized storage facilities for petroleum at the pipeline			

Transportation is a significant cost of grain marketing. The movement to unit train shipment of grain has decreased the cost for those with the facilities to handle unit train shipments, but has created a competitive disadvantage for smaller businesses. A unique marketing arrangement involving six cooperatives located adjacent to each other on the rail line is regarded by the managers as very successful. By agreeing to market their grain through the joint venture they improved their bargaining position and have been able to obtain much more favorable freight rates from the railway.

Fertilizer sales and custom application services are expensive to offer, and some of the cooperatives are not large enough to offer these services on their own. However, strategic alliances, with cooperatives working together, provide the critical (larger) customer base.

Processing equipment in feedmills and for cleaning and bagging of pinto beans is expensive and requires significant volume to operate efficiently. Once again, strategic alliance agreements between two cooperatives have allowed the businesses to enjoy the lower costs of production and provide the goods and services to their members. Managers also reported significant size economies in petro-

leum storage facilities. Several cooperatives are part of a strategic alliance agreement involving joint ownership of petroleum storage facilities at the pipeline. Liquid propane storage and delivery equipment was an area where managers noted the advantage of a joint venture. None of the cooperatives did enough business on their own to warrant the investment in storage and distribution equipment, but with the joint venture they were able to provide the service to their members.

Inventory management is particularly challenging for local cooperatives. With respect to farm supply, managers must balance the cost of holding inventory with the need to satisfy member demand. Several managers reported using informal strategic alliances to work around this problem. They would buy and sell product, at cost, with their neighboring cooperatives when members needed supplies, such as a certain size of tire.

Managers also reported informal strategic alliances involving storing each other's grain. Given the nature of irrigation in eastern Colorado, it is common to find wheat as the primary crop in one area and irrigated corn as the primary crop in an adjacent area. In this way, managers of adjacent cooperatives are serving different markets when it comes to grain marketing and have found it profitable to store each other's grain during the rush season of harvest. With the wheat being moved out of the elevator system before the corn harvest, the managers are able to make efficient use of elevator storage and handling facilities. Several cooperatives are part of a venture involving joint ownership of a terminal grain storage facility at Kansas City, which gives them better access to end-user and export markets. Finally, cooperatives along a branch rail line reported the benefits realized by using rail cars provided by the regional to move grain inventory in a timely manner.

Joint venture agreements involving a new cooperative organization or a limited liability company (LLC) were reported by several of the managers. In some cases, where several cooperatives invested in a convenience store and tire center in a different location, the ventures were for investment purposes only. In the case of the joint venture large-scale hog operation in Yuma county, the investment represented vertical integration for the cooperative business. For the members of the local cooperative, the hog operation represents a value-added opportunity for the feed grains they are producing.

Technical expertise is vital to the success of any business, but, once again, local cooperatives face the challenge of not being large enough to be able to afford to hire the necessary personnel. Several of the cooperatives have overcome this challenge by sharing an employee who monitors Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA) compliance issues. The managers reported two advantages of this agreement. First, they only had to pay their part of the salary of the employee. Second, given the complexity of OSHA and EPA regulations, experience is important when deciding how to act to stay in compliance. The employee is able to apply insights gained from one cooperative to situations at the other cooperatives.

Most of the cooperatives reported that it was becoming ever more important to provide education and assistance to their members on grain merchandising. In one joint venture, the employees of the commodity brokerage company are able to provide member education by working with marketing clubs associated with each of the participating cooperatives.

Finally, several of the cooperatives reported the advantage of obtaining technical expertise from the regional cooperatives. In some cases, the regional assists by arranging for transportation of grain with the railway, and in other cases the regional performs market surveys to evaluate the feasibility of new investments.

VII. Factors Contributing to Success and Failure of Business Arrangements

Joint venture and strategic alliance agreements involve ongoing business relationships between two or more businesses. In this section we explore how managers view the challenges of maintaining successful business arrangements. We report their responses to the questions concerning what factors contribute to these arrangements' success or failure. In examining the responses we test our hypotheses presented earlier.

Table 4 reports the responses to the question of what factors contribute to the success and failure of the joint venture and strategic alliance agreements. The first column reports the number of managers who identified the importance of the factors in maintaining a successful agreement. The second column reports the number of managers who indicated that a lack of attention to the factor would contribute to the failure of the agreement. The number of responses in the failure

TABLE 4. Factors That Contribute to the Success or Failure of Strategic Alliance and Joint Venture Agreements Among Cooperatives.

Factor	Number of Firms Citing as Contribution to Success	Number of Firms Citing as Contribution to Failure
Trust	9	0
Commitment	9	3
People (Particularly Managers) Who Work Well Together	12	1
Benefits of Joint Efforts are Visible	6	0
Good, Open Communication	9	0
Don't Intrude on Business Territory of Others	3	3
Educating New Board Members/ New Managers When They Arrive	0	4
Staying Involved in the Business Agreement	3	1
Business Agreements Where the Managers are Familiar	1	2
Egos	0	2
Use Board Decision Whenever Possible	1	1
Delegate Decisions to Those Directly Involved	2	0
Contracts to Delineate the Details and Enforce Obligation	1	0
Good Feasibility Studies	1	0
Don't Push Membership	1	0
Honesty	1	1
Having Fair/Equitable Business Agreements	1	0
Helping Your Neighbor	1	0
Keep the Agreements Simple	1	0
Time	0	1
Stay Open Minded	1	0
Partner not Financially Sound	0	1

column is much fewer than in the success column. The managers, perceiving the nature of the agreements they were involved in as successful, found it easier to report on success than failure. It is important to note that an open-ended question was used when asking the managers about success and failure factors. These responses, therefore, represent the factors that managers felt were important at the time of the interview. It is certainly possible that some of the managers did not think of particular factors during the interview, but, if asked about them, would have identified them as important. For example, nine of the managers specified that trust was an important factor. However, all twenty of the managers might have indicated that trust was important if they had been asked, "Is trust important in contributing to the success of the business agreement?"

The success responses cited by three or more managers included:

- trust;
- commitment;
- having managers who work well together;
- having agreements where the benefits of joint efforts are visible;
- having good, open communication;
- not intruding on the business territory of others; and
- staying involved in the business agreement.

These responses are consistent with economic theory and the hypotheses identified in the fourth section of this paper.

The factors contributing to success that were cited by one or two managers tend to be more "operational" in nature. A closer examination of these factors suggest that many of them are related to the hypotheses stated earlier. The importance of delegating decisions to those who are directly involved is consistent with the hypothesis of remaining informed on the operations of the business arrangement.

Having good feasibility studies that identify the potential benefits of the agreement is consistent with the hypothesis of knowing the benefits of the business arrangement. The importance of contractual arrangements to nail down the details and enforce obligations is consistent with the theory that arrangements will be more successful if players who violate them are punished for violation.

Familiarity with the business was cited as an important factor contributing to the success of the business arrangement. This is consistent with the hypothesis that business arrangements will be more successful the more homogeneous the business partners are, as it is easier for managers to remain informed if they are engaged in similar business activities. The two factors noted involving the importance of board decisions and not pushing the membership on an idea before the membership is ready are consistent with the hypothesis concerning long-term involvement and commitment. In these instances the managers were noting the importance of extending the commitment beyond the manager level to the board and membership levels of the cooperative.

It is interesting to note that when asked about factors contributing to failure, the factor of "a partner that was not financially sound" was identified. The opposite of this point was not identified under factors contributing to success. This factor is consistent with our hypothesis of financially sound partners noted earlier.

Toward the end of the interview, we asked the managers to identify any constraints that they were facing with respect to the pursuit and establishment of

TABLE 5. Factors Constraining the Establishment of New Agreements.

- Financial
  - lack of funds and/or
  - problems in deciding among investment alternatives
- Non-progressive board members
- Small town "politics"
- Egos
- Lack of communications between managers and board members to ensure everyone understands the value of the agreements
- Membership inertia
- Legal fees

new joint venture and strategic alliance agreements. The responses are reported in table 5. Two of the factors cited, financial and legal fees, relate to the operational logistics of establishing joint venture and strategic alliance agreements. The remainder of the factors, non-progressive board members, small town politics, egos, communications between managers and board members, and membership inertia, relate to the challenges of effectively dealing with interpersonal dynamics in business arrangements.

VIII. Conclusions and Suggestions for Further Study

In this paper we explored joint venture and strategic alliance agreements in which local cooperatives are involved. Using insights from the prisoners' dilemma and assurance problem models in game theory, we developed seven hypotheses regarding factors that contribute to the success and/or failure of these business agreements.

Our hypotheses were confirmed with the information obtained from the interviews of mangers of grain marketing cooperatives in eastern Colorado. While it is necessary to have control of the financial and operational components of the business agreements, our study revealed that the challenges of effectively dealing with interpersonal dynamics are at least as important, and may be more important, than the operational logistics. Consistent with the findings of van Duren et al. (1995), we found that effective business arrangements require trust; commitment; good, open communication; and having managers who work well together.

Our results are consistent with previous research. Reynolds (1995) and Liebrand and Spatz (1994) both suggest that economic efficiencies can be realized with cooperatives undertaking joint business ventures. The large number of agreements reported to us by managers that take advantage of size economies is certainly consistent with their results. In some cases, the cooperatives were also able to take advantage of risk diversification and supply assurance, opportunities deriving from vertical integration (Perry 1989).

While the results of this study suggest that joint venture and strategic alliance agreements can enable local cooperatives to take advantage of size economies, it was beyond the scope of this study to measure those size economies. Future study could examine the minimum efficient size for different aspects of local cooperative operations. These results would be useful to managers negotiating agreements so they would know when they could achieve efficiencies. In addition,

future study could explore, compare, and contrast the nature of business agreements in which local cooperatives in other regions of the country are involved.

In summary, our results further support previous claims (Reynolds 1995 and Liebrand and Spatz 1994) that joint venture and strategic alliance agreements represent an opportunity for local cooperatives to take advantage of size economies while maintaining their individual business identities. Successful agreements require not only attention to the financial and operational components but diligence in the interpersonal dynamics of trust, commitment, and open communication.

Notes

1. The two mergers involved Farmers Union Grain Terminal Association and North Pacific Grain Growers merging to form Harvest States Cooperatives and Ohio Farmers Grain and Supply Association, and Landmark merging to form Countrymark (U.S. Department of Agriculture 1990).

2. Countrymark acquired the assets of Agra Land, formerly Michigan Farm Bureau Services (U.S. Department of Agriculture 1990).

3. The four cooperatives that were dissolved include: Producers Grain Cooperative of Amarillo, Texas; Far-Mar-Co.; Farmers Export Corporation; and Agri-Trans Corporation (U.S. Department of Agriculture 1990).

4. The proposed merger of Land O'Lakes, Farmland Industries, Inc., and CENEX, Inc., fell through in 1989 (U. S. Department of Agriculture 1989). In that same year, three Canadian regional grain marketing cooperatives (Alberta Wheat Pool, Saskatchewan Wheat Pool, and Manitoba Pool Elevators) turned down a proposed merger (Alberta Wheat Pool 1989).

5.For example, the number of country elevator operating units of the Alberta Wheat Pool declined every year during the decade of the 1980s with a total decline of 29 percent (Alberta Wheat Pool 1980-1992, 3-4).

6. The distinction between a joint venture and a strategic alliance is not clear. The *Dictionary of Modern Economics* defines a joint venture as "an association of individuals or firms formed to carry out a specific business project," which is "limited to the success or failure of the specific project for which it was formed" (Greenwald 1972, 321). Van Duren et al. define vertical strategic alliances as arrangements where firms have realized the benefits from collaborating rather than competing when buying and selling commodities. It is also possible to define horizontal strategic alliances. The focus of this paper is to explore joint business arrangements that cooperatives in eastern Colorado are involved in rather than to classify each agreement into one of the two categories.

7. The features of joint venture and strategic alliance agreements are not characterized by the chicken game. The chicken game is characterized by each player being willing to contribute to the common good only if the other player will not contribute (Taylor 1987). The analogy in the business world is a situation where a business will provide a good or service only if all other businesses will not provide the good or service. There is no reason to expect that more than one business will join an agreement to provide the good or service in these cases.

8. A copy of the questionnaire may be obtained by contacting the authors.

9. The U.S. number reflects all cooperatives including marketing, farm supply, and service cooperatives.

10. Dryland winter wheat and irrigated corn, for both grain and silage, are the primary crops. Corn is used in-state on feedlots while wheat is mainly exported out of state. Pinto beans, millet, sorghum, and barley are other traditional crops. Beans are mostly destined for Mexico, and malting barley is usually contracted with local brewing companies.

11. Colorado is the fourth largest cattle feeding state in the United States (Colorado Department of Agriculture 1994). In addition, hog markets have recently become a more significant agricultural subsector in eastern Colorado. Swine operations, small in the past,

are fast becoming vertically integrated, large-scale operations. This has had an impact on local cooperatives' feedmills since large hog operations have taken over and are doing their own feed processing on site. Feedmills and feed processing, though still an important business segment for many grain marketing cooperatives, as indicated in the sales figures in table 1, are, therefore, having to change their marketing approach.

12. The selection of the four categories presented in table 2 was based on the nature of the business arrangements. This categorization was done to make it easier to describe the different arrangements. The focus of this paper is on factors contributing to the stability of the business arrangements and not on why arrangements evolved in different lines of business.

References

Alberta Wheat Pool. 1980 - 1992. *Annual reports.* Calgary, Alberta, Canada.

Axelrod, R., and W.D. Hamilton. 1981. The evolution of cooperation. *Science* (March 27): 1390-1396.

Colorado Department of Agriculture. 1994. *Colorado agricultural statistics.* U.S. Department of Agriculture, National Agricultural Statistics Service, Lakewood, Colorado.

Feuz, D. 1990. Analysis of Colorado typical farms using the farm optimization and financial analysis system (FOFAS). Ph.D. dissertation. Colorado State University.

Greenwald, D. 1972. *The McGraw-Hill dictionary of modern economics: A handbook of terms and organizations.* San Francisco, California: McGraw Hill Book Company.

Hunley, C.L. and D.E. Cummins. 1993. *Marketing and transportation of grain by local cooperatives.* Agricultural Cooperative Service Research Report 115. Washington, D.C.: U.S. Department of Agriculture.

Liebrand, C.B. and K.J. Spatz. 1994. Can a MAC help? Marketing agencies-in-common create sales opportunities for co-ops. *Farmer Cooperatives* (February): 11-12.

Parliament C. and J. Taitt. 1989. Mergers, consolidations, acquisitions: Effect on performance in agricultural cooperatives. Department of Agricultural and Applied Economics, Staff Paper P89-37, University of Minnesota.

Perry, M.K. 1989. Vertical integration: Determinants and effects. In *Handbook of Industrial Organization* 2, eds. R. Schmalensee and R. Willig. New York: North Holland.

Reynolds, B. 1995. Specialization networks offer alternative to consolidation of local cooperatives. *Farmer Cooperatives* (February): 14-16.

Richardson, R., C. Adams, K. DeVille, J. Penn, J. Strutzman, and C. Kraenzle. 1994. *Farmer cooperative statistics.* Rural Development Administration, Cooperative Services Service Report 43. Washington, D.C.: U.S. Department of Agriculture.

Schotter, A. 1981. *The economic theory of social institutions.* New York: Cambridge University Press.

Staatz, J.M. 1987. A game-theoretic analysis of decisionmaking in farmer cooperatives. In *Cooperative theory: New approaches.* Agricultural Cooperative Service Report 18. Washington, D.C.: U.S. Department of Agriculture.

Taylor, M. 1976. *Anarchy and cooperation.* New York: John Wiley and Sons.

Taylor, M. 1987. *The possibility of cooperation.* Cambridge, Great Britain: Cambridge University Press.

U.S. Department of Agriculture. 1989. *Farmer cooperatives.* Agricultural Cooperative Service Report 55 (March). Washington, D.C.

U.S. Department of Agriculture. 1990. *Grain cooperatives.* Agricultural Cooperative Service Cooperative Information Report 1, Section 15. Washington, D.C.

van Duren, E., W. Howard, and H. McKay. 1995. Forging vertical strategic alliances. *Choices* (Second Quarter): 31-33.