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Key Success Factors for Emerging Agricultural Marketing Cooperatives

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Cooperatives comprise an important part of the American agricultural system. Key factors important to the success of agricultural marketing cooperatives were identified and statistically analyzed using data collected from fifty-two cooperatives. The research quantified the effects of several independent variables on the probability of success. These variables were: sufficient equity before start up, maintaining an adequate business volume, keeping and distributing accurate financial records, importance of previous cooperative experience and continued management training for both the board and manager, and marketing agreements. Based on this research and the comprehensive literature review, marketing cooperatives can increase their chances of success by adhering to the recommendations set forth in this study.

The structure of the American food system is changing rapidly as ownership and control take on new dimensions. Independent producers need to vertically coordinate their production through the agricultural system to maximize returns. Cooperatives comprise an important and growing part of this changing agricultural industry. Because of the singularity of user-owner, cooperatives have the ability to solve various market problems facing agricultural producers. The main objective of this study was to identify the key success factors of emerging agricultural marketing cooperatives.

Success can be defined as the satisfactory completion of something, or the attainment of a desired object or end. Based on the literature review, cooperative business success was determined to consist of longevity, member business growth, profitability, and member satisfaction (Carter and VanAuken 1990; Dutrow, Brown, and Williams 1981; Ibrahim and Goodwin 1986; Stuart and Abetti 1987). Twenty-seven independent variables believed to impact success were identified from the literature review, and their impact on emerging marketing cooperatives was examined. The twenty-seven independent variables were grouped into three categories labeled cooperative principle factors, formative and organizational factors, and operating management factors. Cooperative principle factors identified were: member equity, return on member investment, patronage refund, democratic voting, and open membership (Dunn 1988; Ingalsbe 1986; Williamson and Stegelin 1989). Completed feasibility study, feasibility study used, use of start-up resources people, producer initiative, producer expectations, total equity, size

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of business volume, key management person, previous board experience, management experience of manager, cooperative experience of manager, and management training comprised the formative and organizational factors (Chaganti and Chaganti 1983; Howard and Klosler 1991; Sexton and Iskow 1988). The final grouping, titled operating management factors, included the independent variables of timely board meetings, use of strategic resource people, operating plans, long-range plans, marketing agreements, accurate financial records, timely distribution of financial statements, external audits, inter-board relations, board-manager relations (Dickinson, Ferguson, and Sircar 1984; Henning and Horton 1988; O'Neill and Duker 1986).

Methods

Fifty-two emerging agricultural marketing cooperatives were identified through the U.S. Department of Agriculture, Agricultural Cooperative Service's database. These randomly selected cooperatives, located in each region of the country, were surveyed to obtain the data used in this analysis. Fourteen of the fifty-two cooperatives were no longer operating while thirty-eight were still operating. Key leaders¹ from each cooperative were interviewed by the research associate² to acquire the quantitative data needed to complete the statistical analysis. Additional qualitative data, useful in understanding the resulting relationships between the analyzed variables, were also collected.

The quantitative data were analyzed using a logit model to estimate the relationship between the independent variables and the success measure (Hosmer and Lemeshow 1989; Pindyck and Rubinfeld 1981). The number of observations relevant to the number of independent variables, dictated the need to construct smaller models, which were labeled Stage I models. The independent variables were re-grouped within the previously defined categories resulting in six Stage I models. The cooperative principle factors became one Stage I model. The formative and organizational factors category was divided into three Stage I models: feasibility study factors, cooperative formation factors, and organizational management factors. The Stage I models of operational management factors and financial management factors were created from the original operating management factors category. The calculated t-statistic was used to determine the statistical significance of the independent variables within each model. Independent variables, above the 80% significance level in the stage I models, were included in the four succeeding Stage II models, one for each success measure.

Each Stage II model was solved to determine the relationship between the dependant variables and the success measures. The resulting estimated logit coefficients represented the effect of the change in the independent variable on the log of the odds ratio $\{\ln[P(Y_i)/(1 - P(Y_i))]\}$. The odds ratio is a measure of association that approximates likelihood for the outcome (success) to be present among those (cooperatives) with $x = 1$ compared to those with $x = 0$ (Hosmer and Lemeshow 1989). Further mathematical calculation was needed to be able to interpret the change in probability of success or nonsuccess given a one-unit change in the corresponding independent variable.

The Stage II models used in this research were constructed with all dichotomous independent variables. Consequently, the marginal effect of each X_i independent variable was a function of the set of all possible combinations of 0's and 1's of the other X_j independent variables. An example of all the possible sets of combinations for a logit model that contains four dichotomous independent variables is illustrated in table 1.

The logistic function was estimated with each independent variable (X_i) being examined for both 0 and 1 for every possible combination of the other independent variables

Table 1. The Calculation of the Weighted Sample Marginal Effect Estimates: An Example

Equation Number ^a	Independent Variable				Frequency		
	X ₁	X ₂	X ₃	X ₄	GMEE _{LK}	J _k	WSMEE _{LK}
1	1 0	0	0	0	.1487 *	.042 =	.006
2	1 0	1	0	0	.4725 *	.042 =	.020
3	1 0	0	1	0	.3311 *	.125 =	.041
4	1 0	0	0	1	.5645 *	.042 =	.024
5	1 0	1	1	0	.5617 *	.417 =	.234
6	1 0	1	0	1	.3509 *	.000 =	.000
7	1 0	0	1	1	.4887 *	.042 =	.021
8	1 0	1	1	1	.1616 *	.293 =	.047
					.393 = WSMEE_L		

^aThe GMEE is calculated by subtracting the logistical function with X₁=0 from the logistical function with X₁=1. X₁ represents the independent variable being analyzed and stated as X_i in equation 1.

(X_j) resulting in the gross marginal effect estimate (GMEE_{LK}). The GMEE_{LK} represents the change in the probability of success with respect to the change in X_i, holding the other variables (X_j's) constant. There were 2ⁿ/2 different equations used to solve for the GMEE_{LK}, ranging from (1) when all X_j's were 0 to (2) when all X_j's were 1.

$$GMEE_{L(K=1)} = \left(\frac{\Delta P(Y_L)}{\Delta X_i} \right)_{K=1} = \frac{\exp \left(\frac{B_0 + \sum_{j=1}^{n-1} B_j(X_j=0) + B_i(X_i=1)}{B_0 + \sum_{j=1}^{n-1} B_j(X_j=0) + B_i(X_i=1)} \right)}{1 + \exp \left(\frac{B_0 + \sum_{j=1}^{n-1} B_j(X_j=0) + B_i(X_i=0)}{B_0 + \sum_{j=1}^{n-1} B_j(X_j=0) + B_i(X_i=0)} \right)} \quad (1)$$

$$GMEE_{L(K=\frac{2^n}{2})} = \left(\frac{\Delta P(Y_L)}{\Delta X_i} \right)_{K=\frac{2^n}{2}} = \frac{\exp \left(\frac{B_0 + \sum_{j=1}^{n-1} B_j(X_j=1) + B_i(X_i=1)}{B_0 + \sum_{j=1}^{n-1} B_j(X_j=1) + B_i(X_i=1)} \right)}{1 + \exp \left(\frac{B_0 + \sum_{j=1}^{n-1} B_j(X_j=1) + B_i(X_i=0)}{B_0 + \sum_{j=1}^{n-1} B_j(X_j=1) + B_i(X_i=0)} \right)} \quad (2)$$

Where K = {1, ..., 2ⁿ/2}: the set of different equations
 n = {1, ..., z}: the number of independent variables
 L = {1, 2, 3, 4}: the number of dependant variables

This system of equations was solved for every possible combination of independent variables separately for each success measure (dependent variable). Each GMEE_{LK} represents the marginal effect of the set of all possible independent variable combinations and was not representative of the cooperative sample used in this study. The weighted sample marginal effect estimates (WSMEE_L) was formulated to represent the cooperative data set. It was calculated by multiplying the GMEE_{LK} by the frequency distribution (J_k) occurring within the sample (3). An example of this procedure, presented in table 1, illustrates the cooperative's probability of success (member business growth) would be increased by 39.3% (WSMEE_L) when independent variable X₁ (business volume) is present.

$$WSMEE_L = \sum_{k=1}^{(2^n)/2} GMEE_{LK} \times J_k \quad (3)$$

Where J_k = frequency as a percentage of independent variable combinations K.

Interpreting the Results

The four dependent variables identified in this study measured success in a progression from survival to satisfaction of members' desires. Cooperatives that ceased operation earlier than three years from their start were considered not to have longevity. Conversely cooperatives that were operating for three years or longer were scored as having longevity. All the cooperatives in the data set either had completed three or more years of operations or had discontinued before reaching three years of operations.

Reliable numbers measuring member business growth and profitability could not be obtained or did not exist for many of the cooperatives included in this study, especially the discontinued cooperatives. Also the diversity of products marketed, size of operation, and capital intensity varied greatly among the sample population. These issues made it necessary to develop some other method of measuring the level of these success measures. Member business growth represents an increasing trend in the volume of business conducted with cooperative members during the first five formative years based on the key leaders' responses.

While the firm will not likely achieve a profit every year during formation, failing to earn a profit is a likely cause for failure. A cooperative did not need to show a profit every year during the formative years but was considered profitable if it showed a positive net margin at the end of five years. There are several factors that can conceivably influence member satisfaction. This success measure was also scored in the research based on key leaders' responses. If the key leader indicated the members were satisfied with the cooperative's achievements then the firm was categorized as successful in meeting this objective.

The statistical analysis (appendix A) revealed that the independent variables listed in table 2 have a significant relationship with at least one of the four success measures (dependent variables). Interpretation of the results can be made in a similar manner for each number in the table. For example, individuals surveyed were asked whether their cooperative handled enough volume to maintain economic viability. Table 2 indicates

Table 2. Emerging Agricultural Marketing Cooperatives' Change in Probability of Success Attributed to the Independent Variables

Independent Variables	Dependent Variables			
	Longevity	Member Business Growth	Profitability	Member Satisfaction
Business Volume	.22	.39	.25	.38
Total Equity			.36	
Financial Statements	.20	.27		
Marketing Agreement			.28	
Board Experience	.12			
Management Training	.15	.41		.26
Management Person			-.27	-.25
Feasibility Study				-.27

that for those individuals with an affirmative response, there was a 22 percent (upper left cell) higher probability that the firm was still in operation. Conversely, if a firm did not achieve this volume, it was 22 percent more likely to cease operations during the first five years. Each number must be interpreted independently from the other numbers, as statistical techniques to estimate variable combinations were not calculated.

Longevity

Four factors were found to have a significant relationship with the ability of an emerging cooperative to survive the first three years. The variable of business volume was found to be critical to the short-term continuation of the firm increasing the probability of success by 22 percent when present. Accurate financial statements was a second factor important to cooperative longevity. If financial statements were distributed to the board in a timely manner, the firm was 20 percent more likely to continue. Previous cooperative experience possessed by the members of the board of directors also influenced success. The probability of success increased by 12 percent if only one board member had previous cooperative experience compared to a totally inexperienced board. Finally, if the management team, including the board, spent significant effort on training during the initial years, the cooperative was 15 percent more likely to remain in business. New cooperatives can benefit from these results by achieving sufficient volume to remain in operation, maintaining and distributing timely financial statements, attempting to seek board members with previous cooperative experience, and continuing with management and board training.

Member Business Growth

Three factors were identified to have a positive relationship with member business growth. Cooperatives with sufficient business volume were 39 percent more likely to see an increase in member business with the cooperative. Regularly presenting accurate and timely financial statements to the board was found to have a 27 percent increase in member volume. Cooperatives that provided for continued manager and board training were 41 percent more likely to achieve growth. This increases the confidence membership places in the business and results in increased activity.

Profitability

Three factors were found to have a positive significant relationship with the ability of an emerging cooperative to achieve profitability during the first five years. Firms with sufficient business volume were 25 percent more likely to be profitable. If the cooperative secured sufficient equity before starting operations, then profitability was 36 percent more likely. The existence and enforcement of a marketing agreement, the contract between the member and the cooperative, resulted in a 28 percent increased probability of success measured as profitability. However, firms with a management person, either hired or appointed, were 27 percent less likely to turn a profit. Further analysis showed that the negative relationship between the management person and profitability was a function of managers poorly prepared for cooperative marketing situations and/or the relatively high cost of a full-time management person. Hiring managers with previous marketing and cooperative experience should increase the probability of success but does not guarantee it.

Member Satisfaction

Two factors that had significant positive relationships with member satisfaction were identified. Cooperatives with sufficient business volume were 38 percent more likely to satisfy their memberships' expectations. Management and board training resulted in a 26 percent increase in member satisfaction. There were also two variables that had a significant negative relationship with member satisfaction. Results showed that firms hiring a management person were 25 percent less likely to have member satisfaction. Also, firms completing a feasibility study were 27 percent less likely to be satisfactory in their members' eyes.

In the subset of forty cooperatives with managers, further analysis was completed to determine if past management experience and past cooperative experience of the manager, as well as board-management relationships, affected the member's satisfaction with their cooperative. At the 95 percent confidence level, both previous cooperative management experience and excellent board-manager relationships had a positive relationship with member satisfaction. The magnitude (WSMEE) of the relationship was not calculated for this subset of cooperatives. Previous management experience had a significant negative relationship with success. This does not imply that emerging cooperatives should hire inexperienced managers. The qualitative data supported increased member satisfaction for cooperatives that hired a manager with skills closely matching those needed for their cooperative.

To provide additional insights into the relationship between completed feasibility study and member satisfaction, the 52 marketing cooperatives examined in this study were categorized according to the development and use of a feasibility study and the corresponding relationship with member satisfaction (table 3). An examination of qualitative data collected on the five groups of cooperatives in table 3 show the following common patterns:

1. For Groups 1 and 3, four of the six in Group 1 and all four in Group 3 received grant monies which, in most cases, required a feasibility study as a prerequisite to the grant proposal. Many of the members of these cooperatives had no ownership commitment. The respondents also indicated a lack of management ability among the board of directors and/or the hired management.

Table 3. The Development and Use of a Feasibility Study and Member Satisfaction for Emerging Cooperatives

Group	No. of Cooperatives	Development and Use of Study	Member Satisfaction
1	6	No study	No
2	16	No study	Yes
3	4	Study, no use	No ^a
4	15	Study, used	No
5	11	Study, used	Yes

^aNo cooperative that completed a feasibility study and then did not use it had satisfied members.

- For Group 4, the respondents indicated the cooperative's board and members had a high level of commitment. There was also a high level of knowledge and expertise possessed by the external resource people assisting the formation of the cooperative. The primary problems, as indicated by the respondents, were not hiring a qualified manager and not enforcing cooperative policies.
- For Groups 2 and 5, the respondents indicated that a high level of member satisfaction existed. The reasons given were a high level of member and board commitment, hiring a qualified manager, and the use of knowledgeable external resource people.

Many of the cooperatives in Group 2 had completed an informal feasibility study, and the marketing opportunities for the members' products constituted a low risk. However, when a formal feasibility study was used and communicated to the cooperative's membership, as in Group 5, a higher level of member satisfaction existed.

Implications for Emerging Cooperatives

For emerging agricultural marketing cooperatives to succeed in today's economy, they need to be aware of the key success factors that affect them. The set of independent variables influencing the success of emerging agricultural marketing cooperatives closely paralleled the key success factors important to non-agriculture small businesses operating under a variety of business structures. This relationship advocates the hypothesis that these research results can pertain to all emerging agricultural marketing agribusinesses. Based on the findings of this research project, combined with the findings of the comprehensive literature review, emerging cooperatives would increase their chances of success by adhering to the following recommendations:

- The emerging cooperative needs to handle sufficient business volume to remain economically viable. Insufficient business volume does not permit a cooperative to generate the income needed to cover operating costs.
- The new cooperative should implement a management training process for the management team (manager and board members) regardless of the level of previous management experience. A board of directors with previous cooperative experience should be assembled whenever possible. Involving and hiring individuals experienced in working with a business structure similar to the new cooperative will increase the probability of success.
- If business volume and equity permit, a full-time general manager experienced with the cooperative operating structure should be hired. Additional

experience with a specific management skill matching the cooperative's needs such as marketing or purchasing, will be beneficial to the business.

- Accurate financial statements need to be prepared and distributed on a timely basis to the management team. For the management team to effectively manage the new cooperative, the financial statements need to be used on a regular basis.
- The new venture should secure sufficient total equity prior to the initial operation of the cooperative. The critical level of total equity needed should be identified through the feasibility study and planning process.
- Emerging cooperatives need to use marketing agreements to secure business volume commitments from the members or customers before initial operation. These agreements will eliminate some of the risk and can assist in market entry. The business owners should be prepared to enforce the marketing agreements when necessary.

Conclusions

The importance of several independent variables to the success of emerging marketing cooperatives were identified in the research. Securing sufficient equity before start up, maintaining an adequate business volume, and keeping and distributing accurate financial records have often been associated with success. The importance of previous cooperative experience and continued management training for both the board and manager were identified. Marketing agreements can also assist in obtaining success for a variety of reasons. Statistical conformation on the importance of these variables and the relative magnitude of their effect on longevity, profitability, business growth, and member satisfaction should help young businesses better position themselves for success.

Several independent variables were found to be important indicators of success in the literature review but were not statistically significant in this study. The effect of the cooperative principles could not be determined because they were consistently followed by all cooperatives in this study. Member equity, limited returns, patronage refunds, democratic voting, and open membership are all considered necessary for any emerging cooperative to be successful.

This research confirms that emerging cooperatives and agribusinesses can improve their probability of success by addressing the key success factors identified in this study. Although success is never guaranteed, proper planning, financing, and education can improve the odds in the business' favor.

Notes

- Key leaders interviewed were general or acting manager, board president, non-board member, and external resource person. Substitution of other board officers was sometimes necessary.
- All interviews and data collection was completed by one research associate to minimize interpretation variances of the data.

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Appendix A. Results of Stage II Models by Dependant Variable

Longevity Stage II Model					
Independent Variable	Estimated Coefficient	Absolute t-statistic	Significance Level	GMEE/n	WSMEE
Member Investment	-0.726	0.062	0.5201	-.06	-.09
Business Volume	3.313	2.281	0.0226	.30	.22
Management Training	2.913	1.805	0.0710	.27	.15
Management Person	-1.272	1.119	0.2633	-.11	-.12
Board Experience	1.776	1.670	0.0949	.16	.12
Financial Statements	2.058	1.681	0.0927	.18	.20
Strategic Resource Person	-0.632	0.610	0.5420	-.06	-.06
Constant	-13.813	2.265	0.0235		
Likelihood Ratio Test		29.089	0.0001		
Pseudo R ²		0.48			

Member Business Growth Stage II Model					
Independent Variable	Estimated Coefficient	Absolute t-statistic	Significance Level	GMEE/n	WSMEE
Business Volume	2.563	3.633	0.0021	.39	.39
Management Training	2.718	3.074	0.0097	.42	.41
Financial Statements	1.884	1.576	0.1150	.28	.27
Inter Board Relations	1.123	0.888	0.3744	.16	.16
Constant	-12.381	3.633	0.0003		
Likelihood Ratio Test		31.080	0.000003		
Pseudo R ²		0.43			

Profitability Stage II Model					
Independent Variable	Estimated Coefficient	Absolute t-statistic	Significance Level	GMEE/n	WSMEE
Total Equity	2.556	2.778	0.0055	.35	.36
Business Volume	1.818	1.957	0.0466	.24	.25
Management Person	-2.001	1.984	0.0473	-.26	-.27
Marketing Agreement	2.160	1.926	0.0541	.28	.28
Financial Statements	1.399	1.118	0.2635	.18	.18
Start-up Resource Person	-2.168	1.441	0.1495	-.28	-.28
Constant	-6.059	1.957	0.0504		
Likelihood Ratio Test		28.002	0.0001		
Pseudo R ²		0.39			

(continued next page)

**Member Satisfaction
Stage II Model**

Independent Variable	Estimated Coefficient	Absolute t-statistic	Significance Level	GMEE/n	WSMEE
Completed Feasibility	-1.956	2.362	0.0182	-.22	-.27
Total Equity	0.442	0.528	0.5973	.10	.12
Business Volume	3.221	3.296	0.0010	.34	.38
Management Training	1.951	1.908	0.0564	.25	.26
Management Person	-2.212	1.945	0.0518	-.23	-.25
Constant	-2.657	1.101	0.2708		
Likelihood Ratio Test		32.713	0.000004		
Pseudo R ²		0.38			