Investment Decisions in New Generation Cooperatives:

A Case Study of Value Added Products (VAP) Cooperative

in Alva, Oklahoma*

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ABSTRACT: Explaining the phenomena of the new generation cooperatives development is important to understand why some producers invest in the new generation cooperative investment and some do not. Results from factor analysis and Tobit model suggest that non-monetary benefits from investment are significant factors that influence producer investment decisions in the new generation cooperative.

KEY WORDS: closed cooperatives, Tobit model, investment theory, factor analysis.

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Introduction

Within agricultural markets in the United States, new generation cooperatives are one of the most important new institutional innovations. In many states, relatively conservative agricultural producers are investing in relatively risky new generation cooperative ventures. The objective of this paper is to explain why some producers invest in the new generation cooperative investment and some do not.

Throughout the United States, many traditional cooperatives are merging, forming joint ventures and coalitions, or struggling to survive while new generation cooperatives are increasing in size and number. Traditional cooperatives have struggled to acquire equity because cooperative ownership *per se* conveys no benefit. Benefits generally come only on the basis of patronage. Traditional cooperatives attempt to build equity out of the profit stream. Members receive a portion of their allocated profits in the form of stock. Generally, there is no secondary market for traditional cooperative stock which is redeemed at face value by the cooperative at some future date.

New generation cooperatives attempt to solve the equity problems of traditional cooperatives by changing the property rights structure (Cook and Iliopoulos, 2000). New generation cooperatives have a more clearly defined membership policy (closed or well-defined), a secondary market for members' residual claims, patronage and residual claimant status restrictions, and an enforceable member pre-commitment mechanism.

Oklahoma's first new generation cooperative Value Added Products (VAP) recently opened in Alva, Oklahoma. The cooperative produces frozen dough products and started operation in 2000. To encourage new generation cooperatives, the Oklahoma legislature passed

the "Oklahoma Agricultural Producer Credit Act" for Oklahoma agricultural producers who invest in Oklahoma agricultural processing or marketing ventures (68 O.S. Section 2357.25). This act allows producers/investors to claim an Oklahoma income tax credit of up to thirty percent of their investment in Oklahoma producer-owned agricultural processing cooperatives, ventures or marketing associations created and designed to develop and advance the production, processing, handling and marketing of agricultural commodities grown, made or manufactured in Oklahoma. Several other groups are organizing to form similar cooperatives in Oklahoma and throughout the United States.

Investments in many closed cooperatives may have a high degree of risk. The risks associated with VAP Cooperative are a prominent consideration because this investment is a start-up enterprise, which currently only sells its product to a limited number of customers, and its product market (pizza dough) is in a highly competitive market. There is direct competition from many companies with far greater resources and experience. In addition, VAP Cooperative relies on a single product line and has a limited product distribution system.

Greater understanding of the forces influencing new generation cooperative development could help existing cooperatives make changes to survive and facilitate the creation of new cooperatives. Determinants of the survival and stability of agricultural closed cooperatives are empirically tested and evaluated.

The model we used in this paper is an extension of the previous theory of agricultural cooperatives by integrating investment theory, non-monetary benefits, and fairness into a theory of cooperative development. Both Staatz (1983) and Sexton (1986) have used cooperative game theory to study agricultural cooperatives. Sexton argued that most responses to the forces

inducing change involve the formation of *coalitions*[1] that frequently require financial investments and have the potential to create non-monetary benefits for members. New generation agricultural cooperatives are coalitions of agricultural producers. The theory of coalitions has been developed largely independently in the economics literature.

The essential difference between this paper and previous studies is that it treats the decision to join a closed cooperative as an investment decision and suggests that non-monetary payoffs and investor's perception of fairness may influence investment decisions. Closed cooperative investments are considered within the context of a portfolio of investment choices a producer can make. A member of a closed cooperative receives specific rights (delivery rights) in return for his/her investment. These rights are often transferable and may change in value. Payoffs are based on the amount of investment and whether the delivery obligation has been met. The value of the delivery right is expected to be directly related to both the size of the monetary distributions to the members as well as the perceived non-monetary benefits created for members.

I. The Model

For notational purposes, we need to define the variables used in our equations. Let $p = (p_1, \ldots, p_A)$ denotes for the vector prices of the assets. $x = (x_1, \ldots, x_A)$ represents the assets or portfolio choices. The variable $R = (R_1, \ldots, R_A)$ denotes for expected return on the portfolio choices 1, …, A and $G = (G_1, \ldots, G_A)$ represents the non-monetary benefits from portfolio x. The investor's expected return of portfolio x is denoted by $W = Rx$; f is a vector of the investors' perception of fairness for each asset $f = (f_1, \ldots, f_A)$, and W_o represents initial level of wealth.

[1] *Coalitions* in agricultural marketing systems are horizontal and/or vertical groups of individuals or firms within the agricultural marketing system for whom a new set of binding rules or contracts are formed.

$U(\cdot)$ is the von Neuman-Morgenstern utility function which is enhanced with non-monetary benefits, risk, and a fairness component.

The risks associated with cooperative investment as part of producers' portfolio are represented by variance of return on investment from the portfolio *x*. The variance of return from portfolio *x* is represented by $\phi x'Vx$ where $\phi < 0$ is the risk-aversion parameter, and the investor's utility from portfolio *x* has mean μ and variance σ^2. Utility is a function of expected return on investment, the variance of return from the portfolio, perception of fairness, and non-monetary benefits associated with that portfolio choice. Producers are hypothesized to maximize utility subject to a wealth constraint:

$$\max_x U(Rx, \phi x'Vx, Gx, fx)$$

$$\text{subject to } p \cdot x = W_o$$

$$\text{and } x \geq 0$$

Suppose that we have observed a portfolio choice x^i for $i = 1, \ldots, n$, the rational investor will choose portfolio x^i if and only if

$$U(Rx^i, \phi x^{i\prime}Vx^i, Gx^i, fx^i) \geq U(Rx, \phi x'Vx, Gx, fx)$$

for all portfolio *x* such that $p^i x^i \geq p^i x$. This expression tells us that given the expected return *R*, variance/covariance matrix *V*, non-monetary return vector *G*, and fairness vector *f*, investors decide to invest in the cooperative membership if the expected utility from a portfolio containing a cooperative investment exceeds any other affordable portfolio.

There are two ways of proving necessary and sufficient conditions for the validity of the utility maximization model[2]: Slutsky conditions and revealed preference conditions (Varian, 1983). Revealed preference conditions are used because this approach is more applicable for empirical analysis.

The Closed Cooperative Investment Model

The investor's interest is what the optimal value of x^i is to achieve maximum utility and how the optimal utility changes as x^i changes. Suppose that μ, D, σ^2, and F are chosen to maximize investor's utility function. For each different value of x^i there will typically be a different optimal choice of μ, D, σ^2, and F . For example, a different amount of delivery rights purchased will determine different optimal choice of monetary and non-monetary benefits, risks, and perception of fairness. Let us denote the maximum utility as $M(x^i)$ for different choices of x^i, and $\mu = Rx^i$; $D = Gx^i$; $\sigma^2 = \phi x^{i\prime} V x^i$; $F = fx^i$ and $g(x^i, W_0) = p^i x^i - W_0$,

$$M(x^i) \equiv \max_{x^i} U\left(\mu(x^i), D(x^i), \sigma^2(x^i), F(x^i)\right)$$

$$\text{subject to } g(x^i, W_0) = 0 \text{ and } x^i \geq 0$$

by setting the Lagrangian function

$$L(x^i, \lambda) = U\left(\mu(x^i), D(x^i), \sigma^2(x^i), F(x^i)\right) - \lambda g(x^i, W_0)$$

and taking the first-order conditions with respect to x^i and λ then the closed cooperative investment function,

(1) $$x^{i^*} = x^{i^*}(R, G, \phi V, f, p^i, W_0)$$

[2] The necessary and sufficient conditions for the mean-variance utility maximization of closed cooperative portfolio model are described in Puaha and Tilley (2002).

Hypotheses

The hypotheses generated from our model provide the meaningful reasons why producers invest in closed cooperative investment:

H_1: The producers who want to create employment opportunities and support economic development in their local community are more willing to invest in a cooperative as part of their portfolio if that investment provides those non-monetary benefits.

H_2: The group of risk-averse producers is more willing to invest in a closed cooperative if they perceive that investment to have relatively low risk.

H_3: The producers who are concerned about fairness are more willing to invest in a closed cooperative if that enterprise provides treatment that is perceived as fair.

II. The Survey Method and Factor Analysis

The surveys were sent by mail to 712 members of Value Added Products Cooperative Association, a closed cooperative at Alva, Oklahoma and a random sample of Oklahoma wheat growers (members removed) who were non-members of VAP Cooperative. The survey instruments for the wheat producers were designed to allow for comparison of the results between the two samples of wheat producers. The questionnaire was first mailed on January 28, 2002. One week later, a thank you postcard was mailed to all respondents. On February 25, 2002 the second mailing of the questionnaire was sent out to those who did not respond in the first mailing. Finally, those who still did not respond received a phone call requesting completion of the questionnaire. Some of the respondents who were called requested a third mailing. Responses from 298 respondents who did not invest and 323 respondents who did invest in VAP Cooperative were received.

The VAP Cooperative questionnaire starts with questions about the respondent's farmland location, the length of time they have operated a farm business, wheat production, farm acreage, land ownership, and some wheat marketing questions. A section focuses on the respondent's familiarity with VAP Cooperative and their method of learning about VAP Cooperative. Respondents were asked about their expected rate of return on their VAP investment compared to other debt or investment interest rates. Respondents indicate whether they are able to claim the Oklahoma Agricultural Producer income tax credit as a result of their VAP investment or investments similar to VAP. Then, respondents indicate whether or not they have off-farm employment. Respondents were also asked to agree or disagree with several statements about whether perceptions of fairness, non-monetary benefits, tax credit, risk, marketing contract, and transferability of VAP's share affected their investment decision. The last part of questionnaire includes some questions on the respondents' demographic characteristics such as gender, age, and education level.

The survey of wheat producers produces a complex set of raw data for testing the hypotheses of the proposed model. Raw data consist of several sets of scores of N observations. A correlation exists between sets of scores that can be measured by the correlation matrix produced. The sets of scores that are recorded from producers' attitudes toward the statements about VAP Cooperative investment decisions are grouped by their classification related to the variables in the model as follow: (1) items that measure fairness; (2) items that measure attitudes toward the marketing contract; (3) items that measure social benefits; (4) items that measure risk.

In order to simplify a complex set of data, factor analysis was used. The central idea of factor analysis is to reduce the dimensionality of a data set that consists of a large number of interrelated variables, while retaining as much as possible of the variation present in the data set.

This is achieved by transforming the raw data to a new set of variables which are uncorrelated and ordered so that the first few factors retain most of the variation present in all of the original variables.

The methods of factor analysis used in this study are principal component and maximum likelihood factor analysis. Principal component analysis has simple algebra and computation techniques based on how the factors account for variance and explain correlations. The purpose of principal components analysis is to be able to estimate the correlation matrix, and this can be done by finding the characteristic equation of the matrix. This requires two sets of values, the characteristic vectors of the matrix or eigenvectors and the characteristic roots or eigenvalues[3].

Maximum likelihood factor analysis, as a method of condensation, is expected to search for factors. The strongest argument for choosing maximum likelihood factor analysis lies in the fact that it has statistical tests for the significance of each factor as it is extracted.

The most critical element is whether a factor loading is significant or not, regardless of what method of condensation is used. Normally, a factor loading of 0.3 that indicates 9 percent of the variance is accounted for by the factor, is taken as a criterion to indicate that the loading is remarkable (Kline, 1994). This paper regards a factor as a remarkable loading if the loading is above 0.3.

Comparable data from members and non-members of VAP Cooperative were merged into one data set. The principal component analysis is performed by the *FACTOR* procedure in SAS. The output includes all the eigenvalues and the pattern matrix for eigenvalues greater than one. Given the sets of scores from producers' responses toward the statements about VAP

[3] The eigenvector is a column of weights each applicable to one of the variables in the matrix. For example, if there are five variables there would be five weights in the first vector. The eigenvalue is the sum of squares of the factor loadings of each factor and reflects the proportion of variance explained by each factor. Thus, the larger the eigenvalue the more variance is explained by the factor.

Cooperative investment decisions, four social/non-monetary scores and five risk scores were available for analysis.

Then the hypotheses testing using maximum likelihood method is performed to confirm the number of factors that should be retained. The combination of two methods in this factor analysis provides better results because the principal component analysis was first used to get a rough idea of the number of factors before doing the maximum-likelihood analysis.

Using the factors generated from the factor analysis, then the model is estimated using a Tobit procedure that is appropriate for the censored dependent variable. The censored regression model in this study is estimated using the method of maximum likelihood. This model has both discrete and continuous parts in its dependent variable (Johnston and DiNardo, 1997). Instead of observing the decision to invest in VAP Cooperative, the data on the amount of shares producers invested are observed. Thus, using the Tobit model the observed dependent variable is given by

$$\textbf{(2)} \qquad \begin{array}{ll} I_i = I_i^* & \text{for } I_i^* > 0 \\ I_i = 0 & \text{for } I_i^* \le 0 \end{array} \qquad \text{for } \; i = 1, \ldots, N$$

where I^* represents the amount of share units producers invested in the VAP Cooperative for those who joined the VAP Cooperative, and zero for those who did not join.

The estimated equation is:

$$\textbf{(3)} \quad \begin{aligned} I_i = {} & \alpha_1 + \alpha_2 DISTANCE_i + \alpha_3 YEAR_i + \alpha_4 FAMILIAR_i + \alpha_5 FAIR_i + \alpha_6 CONTRACT_i \\ & + \alpha_7 RISK1_i + \alpha_8 RISK2_i + \alpha_9 SOCIAL_i + \alpha_{10} RATE_i + \alpha_{11} WORK_i + \alpha_{12} TAX_i + \varepsilon_i \end{aligned}$$

$$\text{for } \; i = 1, \ldots, N$$

where $DISTANCE_i$ is the distance of respondent i's farm location from VAP Cooperative in miles. $YEAR_i$ is the number of years respondent i has farmed, $FAMILIAR_i$ is the variable for respondent i's awareness of the VAP Cooperative, $FAIR_i$ is the variable representing the

respondent's perception about fair treatment delivered by VAP Cooperative, $CONTRACT_i$ is the variable representing the respondent's perception about VAP Cooperative marketing contract.

$RISK1_i$ and $RISK2_i$ are the first-two factors retained from the maximum likelihood factor analysis that represent the respondent's perception about risk on VAP Cooperative investment, $SOCIAL_i$ is the first factor retained from the maximum likelihood factor analysis that represents the respondent's perception that VAP Cooperative creates social/non-monetary benefits to investors, $RATE_i$ is the expected rate of return from VAP Cooperative investment for respondent i, $WORK_i$ is the dummy variable for off-farm employment, TAX_i is the dummy variable for the Oklahoma Agricultural producer income tax credit, and ε_i is an independent identically distributed error term.

III. The Results

The VAP Cooperative Survey

Producer characteristics for those who invested and those who did not invest in VAP Cooperative are shown in Table I. Seventy-nine percent of the respondents that invested in VAP Cooperative were male while 96 percent were male that did not invest in VAP Cooperative.

The mean farm acreage for VAP members was 1609.09 acres with 39 percent of those acres planted to wheat (620.67 acres) and non-VAP members having an average 1162.31 acres with 36 percent in wheat (422.86 acres). The VAP members produced an average of 18,015.68 bushels in 2000 and 16,717.32 bushels in 2001 while non-VAP members produced an average of 10,507.40 bushels in 2000 and 9,348.57 bushels in 2001.

Table I. General Descriptive Information about Respondents in Study

Characteristics	VAP Members	Non-Members
Gender:		
Male	78.46 %	96.23 %
Female	21.54 %	3.77 %
Education:		
Average	15.27 years	14.29 years
High school	19.55 %	35.32 %
College	55.77 %	49.81 %
Post Graduate	24.68 %	14.87 %
Average Age	56.86 years	58.16 years
Percentage of income from wheat	63.66 %	61.13 %
Averages:		
Farm acreage	1609.09 acres	1162.31 acres
Acres of wheat	620.67 acres	422.86 acres
Farmland was rented from others	34.77 %	38.87 %
Wheat production in 2000	18,015.68 bushels	10,507.40 bushels
Wheat production in 2001	16,717.32 bushels	9,348.57 bushels
Number of years farming:		
Average	30.65 years	31.43 years
More than 5 years	95.91 %	100.00 %
More than 10 years	88.05 %	93.21 %

Familiarity with VAP Cooperative is measured on a one to five scale, with a one being not familiar through a five being highly familiar. Forty-three percent of producers that invested in VAP Cooperative were moderately familiar with VAP Cooperative while about 48 percent of non-VAP members were not familiar with VAP Cooperative (Table II).

Table II. Percentage of Familiarity with Value Added Products Cooperative

Level of familiarity	VAP Members (N=321)	Non-Members (N=280)
Not familiar	0.62 percent	47.50 percent
Less than moderately familiar	7.17 percent	22.14 percent
Moderately familiar	43.30 percent	21.07 percent
Greater than moderately familiar	25.86 percent	5.36 percent
Highly familiar	23.05 percent	3.93 percent

The members' share ownership is shown in Table III. Sixty-eight percent of VAP Member owned between 1,000 to 3,000 shares. About nineteen percent owned between 3,001 to 5,000 shares. Producers that owned more than 20,000 shares were around 0.94 percent.

Table III. The Percentage of VAP Cooperative's share ownership

Amount of Shares	Percentage of Responses	Number of Responses
Between 1000 to 3000 shares	**68.03**	**217**
Between 3001 to 5000 shares	19.12	61
Between 5001 to 7000 shares	2.19	7
Between 7001 to 10000 shares	6.27	20
Between 10001 to 15000 shares	1.57	5
Between 15001 to 20000 shares	1.88	6
More than 20000 shares	0.94	3

Minimum VAP Cooperative's share ownership is 1000 shares.

Results related to producers' attitude toward VAP investment decisions are summarized in Table IV. Most VAP members indicated that VAP Cooperative creates non-monetary or social benefits. However, more than fifty percent of non-members did not indicate that VAP Cooperative creates non-monetary benefits (items *a*, *b*, *f*, and *m*, Table IV). Eighty-two percent of members and only 37 percent of non-members agreed that creating jobs in Alva is important for them. Fifty-four percent of members said that other people that they knew were investing in VAP. Seventy-three percent of investors said that they knew the people organizing VAP Cooperative, and 62 percent of them agreed that they would attend the VAP annual meetings. However, fifty-four percent of non-members stated that the other people that they knew were not investing. Sixty-one percent of them did not know the people organizing VAP, and around fifty-one percent would not attend the VAP annual meetings if they were members.

When asked about fairness issues such as treatment of VAP to the investor, and distribution of patronage refund, more than 50 percent of members believed the VAP's treatment and its patronage distribution were fair (items *e* and *n*, Table IV).

Table IV. Members and Non-members' Attitude toward Statements about VAP Cooperative Investment Decisions

Statements	VAP Members, in %			Non-Members, in %		
	Disagree	Uncertain	Agree	Disagree	Uncertain	Agree
a. Creating jobs in Alva is important for me	10.53	7.89	**81.58**	28.99	34.30	**36.71**
b. Other people I know said they were investing in VAP	30.13	15.56	**54.30**	**53.54**	35.86	10.61
c. The business prospectus for VAP appeared logical	3.63	13.20	**83.17**	15.31	**51.53**	33.16
d. I could take advantage of the 30% Oklahoma Agricultural Producer income tax credit	6.56	7.54	**85.90**	16.84	38.78	**44.39**
e. Producers/investors in VAP will be treated fairly	3.64	27.15	**69.21**	8.21	**62.56**	29.23
f. The people organizing VAP were known to me	13.58	13.91	**72.52**	**60.82**	24.23	14.95
g. Shares in VAP can be bought and sold	23.51	33.11	**43.38**	12.76	**72.45**	14.80
h. The probability of patronage refunds would be high	9.60	33.77	**56.62**	18.46	**67.18**	14.36
i. VAP is a low-risk investment compared to investment in farmland	**36.96**	33.66	29.37	33.85	**54.36**	11.79
j. My other investments are low risk	**41.39**	23.84	34.77	**48.47**	15.31	36.22
k. The probability of VAP success was greater than 90%	15.89	40.07	**44.04**	30.41	**62.89**	6.70
l. Producers need to form cooperatives to increase their income	7.92	20.13	**71.95**	11.56	28.14	**60.30**
m. As an investor, I plan to attend the VAP annual meetings	8.94	29.47	**61.59**	**51.31**	42.93	5.76
n. The planned patronage distribution from VAP is fair	2.33	40.20	**57.48**	11.28	**78.97**	9.74
o. Marketing/production contracts are good for agriculture	6.60	17.82	**75.58**	11.62	33.84	**54.55**
p. Agric. Marketing coop are better if they have a marketing contract	4.32	26.91	**68.77**	11.73	35.71	**52.55**
q. Only agricultural producers are allowed to participate in the VAP Coop	12.87	17.82	**69.31**	14.80	**54.08**	31.12
r. Meeting wheat delivery requirements to VAP is relatively easy	1.66	7.28	**91.06**	19.80	**63.96**	16.24
s. Shares in VAP will appreciate in value	4.64	45.03	**50.33**	11.34	**77.84**	10.82

Strongly disagree and disagree are combined. Agree and strongly agree are combined.

Both members and non-members did not have a problem with a marketing contracts (items *o* and *p*, Table IV). The risks associated with VAP investment showed very interesting results. Thirty-seven percent of investors considered that VAP Cooperative was a risky

investment compared to an investment in farmland. Forty-one percent of members and over forty-eight percent of non-members thought that their other investments were high risk. A majority of non-members were not sure about the risk associated with VAP success in the future (items *h*, *i*, *j*, *k* and *s*, Table IV).

Investors' agreement toward the statement about whether or not they are able to take advantage of the 30 percent Oklahoma agricultural producer income tax credit apparently supports the investment hypothesis, as may be seen in Table IV, item *d*.

Maximum-Likelihood Factor Analysis

The eigenvalues indicate that one factor provides an adequate summary of the data. One component, with eigenvalue 2.2721, accounts for 57 percent of the total variance and two components explaining 75 percent of the variance, as may be seen in Table V.

Table V. The Eigenvalues of the Correlation Matrix for Social/Non-monetary Benefits Factors

Eigenvalue	Difference	Proportion	Cumulative
2.2721	1.5419	0.5680	0.5680
0.7302	0.1938	0.1826	0.7506
0.5364	0.0752	0.1341	0.8847
0.4613		0.1153	1.0000

The first factor is a measure of the overall social or non-monetary benefits factor since the first eigenvector shows approximately equal loadings and has large positive loadings on all variables (Table VI). The correlation with the variable *MKW* is especially high (0.81743). By taking the average of the squared loadings of the first factor, it explains 57 percent of the variance in the correlation matrix.

Table VI. The First Factor Pattern for Social/Non-monetary Benefits Variables

Variables	Description	Factor1
JOB	Creating jobs in Alva is important to me	0.77716
PIV	People that I know also invest in VAP	0.65032
MKW	VAP management are known to me	0.81743
MTG	I will attend the VAP annual meetings	0.75961

Figure 1 plots the size of investment as a function of investors' social perception measures. The size of investment appears to be positively related to perception about social/non-monetary benefits. Higher social factor means more producers perceived that VAP Cooperative provides social/non-monetary benefits.

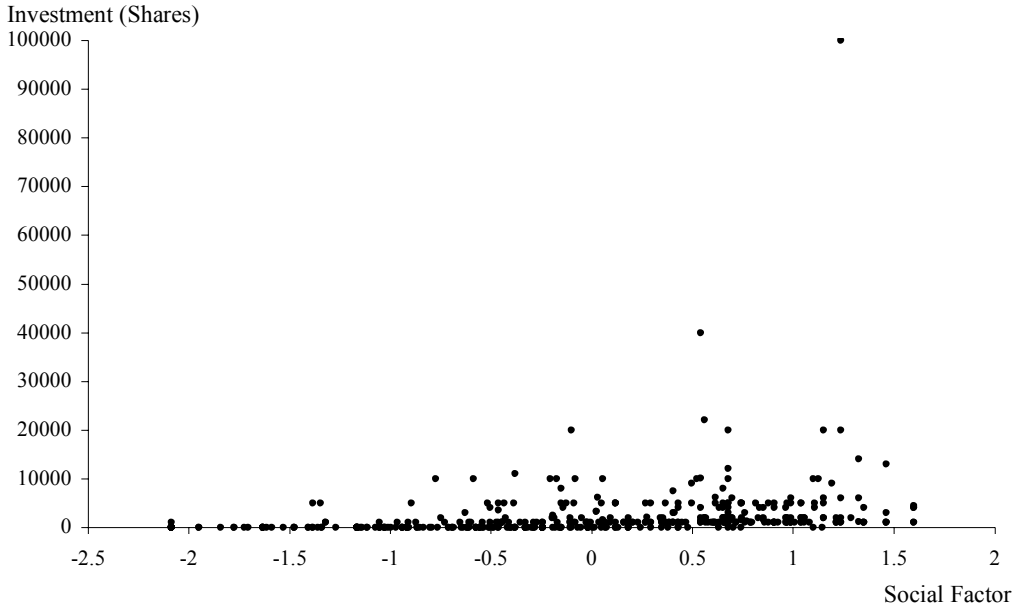

Figure 1: Investors' Perception about Social Benefits Measure by Size of Investment

The analysis related to the risk associated with the VAP Cooperative investment shows that two factors provide an adequate summary of the complex sets of risk variables.

Cooperative Investment Decisions

Using all measures of cooperative investment decisions, the evidence that perceptions about non-monetary/social benefits, risk associated with investment, and fairness affect producers' investment decisions were tested. The statistical analysis is restricted to producers' responses and perception scores available from the VAP Cooperative survey, resulting in a data set of 486 observations.

Accordingly, the *LIFEREG* procedure in SAS was used to estimate the model. The amount of shares of the producers' investment varies considerably, with a minimum value of 1,000 shares and a maximum value of 100,000 shares. The mean producer investment is 3,589 shares with a standard deviation of 6,851.8. Results in Table VII show that among the explanatory variables, the number of shares producers invested in VAP Cooperative is positively related to *FAMILIAR* and *SOCIAL*. The familiarity measure coefficient is positive and significant at the1 percent level. Producers who are familiar with VAP Cooperative are more likely to invest and invest more. The coefficient of the social and non-monetary benefits measure is also positive and significant at the 1 percent level. Clearly, the results suggest that VAP Cooperative should create the perception and the belief that the enterprise produces social benefits to investors. *RISK2*, which represents overall responses of producers that predominantly emphasizes on low-financial risk over the expected monetary return (risk averse) from VAP Cooperative investment, has a negative coefficient and is significant at the 10 percent level. Large potential investors, who are risk averse, perceive that VAP Cooperative is a risky investment and will have less willingness to invest in VAP Cooperative.

The number of shares of investment are found to be negatively related to the distance from Alva (*DISTANCE*) and off-farm employment (*WORK*). The result suggests that the key to

success for VAP Cooperative investment will be determined dominantly by more full-time local agricultural producers' support. The farther their farmland from Alva, the less likely producers will invest in VAP Cooperative. Potential investors are also more likely to be full-time farmers. The distance from Alva (*DISTANCE*) and off-farm employment (*WORK*) are significant at the 1 percent level and the 5 percent level, respectively.

Producers' experience in farm business (*YEAR*) and marketing contracts (*CONTRACT*) had the predicted sign but showed no significant impact on VAP Cooperative investment decisions. Producers' years of farming is negatively related to the VAP Cooperative investment. The coefficient for *CONTRACT* is positive but not significant.

Table VII. Parameter Estimate of the Cooperative Investment Decisions Using Censored Regression Model

Dependent Variables	Lower I_i	Left Censored Values	190
		Distribution	Normal
Number of Observations	486	Log Likelihood	-2985.546976
Noncensored Values	296		

Independent Variables	Parameter Estimate	Standard Errors
Constant	-119.478	1982.426
*DISTANCE***	-9.1412	3.5079
YEAR	-20.6991	15.4161
*FAMILIAR***	1525.417	244.2891
FAIRNESS	125.9939	238.9985
CONTRACT	41.5314	163.6396
RISK1	77.4709	198.3475
*RISK2**	-407.616	246.7011
*SOCIAL***	962.0520	245.4960
RATE	-6.3523	212.3705
*WORK**	-1072.84	528.4470
*TAX**	518.5784	257.4294

** Significant at the 1 percent level, * significant at the 5 percent level

Fairness perception (*FAIRNESS*), overall perception about risk associated with VAP Cooperative investment (*RISK1*), and expected rate of return (*RATE*) show predicted signs, but they are not significant. The agreement with the statement that investors can take advantage of the Oklahoma Agricultural Producer income tax credit (*TAX*) shows a positive effect on VAP Cooperative investment decisions. The income tax credit (*TAX*) is significant at the 5 percent level. Obviously, this result suggests that Oklahoma income tax credit had a positive impact on the VAP investment decision and encouraged the development of VAP.

From the results of the VAP Cooperative investment decisions, it is apparent that the investors bear risks due to changes in the relative business environments that directly affect the VAP Cooperative as a new enterprise. However, the vast majority of wheat producers in the Woods County area invested and became core investors in the VAP Cooperative. The empirical results give supporting evidence to explain this phenomenon. Regardless of the risks associated with VAP Cooperative investment, local agricultural producers in Woods County invested because they believe that VAP Cooperative generates social benefits for the local community.

Using censored regression procedures, the results show that investment provides social/non-monetary benefits at the 1 percent level. Using the evidence from producers' response toward social benefits, this study finds that a closed cooperative can be initiated and will survive if there is significant support from local producers concerned about social/non-monetary benefits.

The Tobit results also found that willingness to invest in VAP Cooperative is less likely if an investor has a strong preference for low risk investments. Producers' responses clearly stated that the VAP Cooperative is not a low-risk investment. Risk-averse investors are not as willing to be investors.

There is not enough evidence to reject the null hypothesis about the impact of fairness on producers' willingness to invest.

IV. Conclusions

The evidence examined in the previous section is, for the most part, consistent with the hypotheses developed in Section 1. The comparison of cooperative investment decisions between VAP members and non-members showed that more explicit positive perceptions are required to convince producers to invest. Positive perceptions of local producers provided the support the VAP Cooperative needed to be developed. And even though many local producers invested, the local producers clearly did not believe that VAP Cooperative was a low-risk investment as compared to investment in farmland.

A hypothesis test confirmed that social or non-monetary benefits have significant impacts on cooperative investment. The results suggest that a new generation cooperative needs strong support from local producers as core-investors to initiate and maintain cooperative as an operational business. Producers who are familiar with VAP Cooperative were more willing to invest in VAP Cooperative, and producers with farmland far away from Alva did not invest in VAP Cooperative. Strong preferences for low-risk investment lowered producers' willingness to invest in VAP Cooperative. With regards to farm-employment status, full-time farmers showed a greater intention to invest rather than part-time farmers.

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