

**Methods of Evaluating Business Opportunities:  
A Study of 70 Cooperatives in Colorado and Indiana**

**Susan Hine  
Maria L. Loureiro  
Joan R. Fulton  
Jennifer M. Vandeburg  
Kevin McNamara<sup>1</sup>**

**WCC-72 Meeting  
June 12, 2001  
Las Vegas, Nevada**

---

<sup>1</sup> Susan Hine and Maria Loureiro are Assistant Professors, Department of Agricultural and Resource Economics, Colorado State University. Joan R. Fulton, Jennifer M. Vandeburg and Kevin McNamara are Associate Professor, Research Associate and Professor, respectively, in the Department of Agricultural Economics, Purdue University.

## **Introduction**

All sectors of agriculture are in the midst of dramatic change, often referred to as the industrialization of agriculture (Boehjle; Drabenstott). As agribusiness firms respond to these structural changes they are expanding into new areas of business and forming linkages with firms at other stages of the supply chain. Agricultural cooperatives are no exception. Vandeburg et. al. (2000a) identify that the driving forces behind cooperative restructuring, through mergers, acquisitions, joint ventures and strategic alliances, are decreasing numbers of farms, increasing costs, industrialization of agriculture, increased competition and decreased profits.

Between 1992 and 1997, the number of grain cooperatives in the U.S. fell from 1,193 to 826 (over 30%) (Crooks, 2000). Merlo notes that in 1998 there were more mergers, consolidations, acquisitions, joint ventures, and strategic alliances among U.S. cooperatives than in the entire history of cooperatives. Fulton's research confirms this and shows that the trend continued through the rest of the decade of the 1990s. It is important to note that this structural change amongst cooperatives is universal. While many of the reorganizations have happened amongst locally owned cooperatives there has also been major structural change amongst the largest cooperatives. Two mergers in 1998 are noteworthy. On January 1, 1998 Dairy Farmers of America was created from Mid-American Dairymen Inc., the Southern Region of Associated Milk Producers, Inc., Milk Marketing Inc. and Western Dairymen Cooperative. Six months later, on June 1, 1998, CHS Cooperatives resulted from the merger of CENEX and Harvest States Cooperatives. (Merlo)

Previous researchers have examined questions relating to the successfulness of cooperative reorganization and cooperative financial health. Parliament and Taitt (1989) looked at reorganizations between the years 1979 to 1984 and found that consolidation of cooperatives resulted in increased efficiencies in some cases. Although the outcomes could not be classified as universally successful when measured from a financial perspective, at least 33% of the observed reorganizations could be classified as unqualified successes. Crooks' research on grain cooperatives tracked the financial health of the cooperative businesses. He found that of a subset of 330 of 367 consolidations that took place between 1993-1997, approximately two-fifths of the 291 cooperatives that stayed in the cooperative family could be described as financially sound (Crooks, 2000). Fulton et. al. and Vandeburg et. al. (2000a) examined factors that influenced the successfulness of new business arrangements. They found that successful agreements require not only attention to the financial and operational components but diligence in the interpersonal dynamics of trust, commitment, open communication and having managers that work well together.

The research to date has focused on examining business restructuring ex post. There is the potential to significantly influence the future health of the cooperative business sector if insights can be gained on factors to consider when evaluating a new business opportunity ex ante. In this paper we examine two questions related to this issue of ex ante evaluation of new business opportunities, including joint ventures, strategic alliances, mergers and acquisitions. These questions are:

- (i) What methods of valuation are cooperatives using when evaluating new business opportunities?
- (ii) What factors influence the methods of valuation preferred by cooperatives when evaluating new business opportunities?

The following section of this paper describes the four methods of business evaluation considered in this paper. The research hypotheses are identified in section three. The data collection, from locally-owned cooperatives in Colorado and Indiana, along with descriptive statistics are reported in the fourth section. The fifth and sixth sections of the paper contain methodology, and model specification. The results of the binary logit analysis are reported in the seventh section. The paper concludes with conclusions and suggestions for further study.

### **Methods of Business Evaluation**

Four common evaluation or capital budgeting methods, used in investment decision-making processes, are considered in this paper. These include payback, simple interest, discount or net present value (NPV), and internal rate of return (IRR). The payback method relies on a simple method of calculating the amount of time it would take to recapture an initial cash outflow through a series of net cash flows, without incorporating the time value of money. The cash flows are then divided by the original investment. Simple interest is merely the inverse of the payback method where the original investment is divided by the anticipated cash flows over the life of the project, to provide an interest rate. Once again, the time value of money or the compounding of interest is ignored.

According to the literature, however, the NPV and IRR methods of evaluation are the preferred approaches since they incorporate the time value of money. The NPV method discounts all future net cash flows at a predetermined investment rate that would

be used by the business as a hurdle rate for new venture decisions. If the resulting dollar amount is positive, then the new venture would earn at least the specified rate of return and the project should be a go, all else equal.

The IRR uses a similar approach, but calculates a rate of return that equates all net cash flows to zero. If that rate of return is equal to or greater than the rate of competing projects, it also is considered to be a good investment decision. Between the two methods, however, the NPV is the preferred choice by financial officers (Gallagher, 1997) because the IRR assumes that all cash flows will be reinvested at the interest rate determined for the project, which may not be the case. It can also give inaccurate results when cash inflows are combined with cash outflows in the same calculation. However, relative to those methods, which do not use the time value of money, IRR is still a preferred choice.

### **Research Hypotheses**

All four methods of business evaluation are well known and their relative merits have been described in financial textbooks for years. With respect to the first research question identified with this paper it is hypothesized that:

- (i) NPV and IRR will be the more preferred methods of evaluation followed by Payback and Simple.

The cooperative businesses that were part of this study are all viable business units of significant size with 52% of them doing over \$15 million of sales in 1999. It is hypothesized that businesses of this stature will utilize the more effective evaluation methods from the perspective of financial management.

With respect to the second question identified with this paper it is hypothesized that:

- (ii) NPV and IRR will be rated higher by the managers of those cooperatives that are larger in size, have a higher level of business “well-being” and are more innovative.
- (iii) Payback and Simple will be rated lower by the managers of those cooperatives that are larger in size, have a higher level of business “well-being” and are more innovative.

Hypotheses two and three address the research question of “what factors influence the methods of evaluation preferred by cooperatives when evaluating new business opportunities?” Since NPV and IRR are the more effective methods of business evaluation from the perspective of financial management a positive correlation is expected between the rating of these measures and the performance of the cooperative. In this analysis three measures of performance are utilized including size, “well-being” and innovativeness. The specific ways in which each of these measures is calculated are discussed in the Empirical Model section below.

## **Data and Descriptive Statistics**

### *The Survey*

In-person interviews with the general manager of seventy locally owned agricultural supply and marketing cooperatives in Indiana and Colorado (35 in each state) were conducted during May and June of 2000. To ensure consistency of the data collected, each interview used a standard survey instrument and was conducted by the same interviewer in each state. The managers were very supportive of the research and

willing to share information about their cooperatives resulting in interviews that averaged ninety minutes in length, but varied from forty-five minutes to two and half hours.

The survey instrument had five sections and asked for information in a variety of areas. The relevant areas for this study included descriptive information about the cooperative, including size of market territory, lines of business, number of members, and types of computer and electronic commerce being used. In addition, a series of questions about the cooperative's financial performance including level of sales, percentage of non-member business, profits, and equity redemption program were asked. Finally, information was collected concerning how the cooperative managers evaluated new business opportunities

#### *Rating of Alternative Methods of Business Evaluation*

Managers were asked to rate each of the four methods of business evaluation (NPV or Discount, Simple, Payback, and IRR) on a 5-point scale with 1 signifying least important and 5 signifying most important. The results are summarized in Figure 1 where the rating is measured on the horizontal axis and the percentage of respondents is measured on the vertical axis. Payback is the method that is rated highest by most of the managers with over 30% of the managers assigning it a rating of 5 and over half assigning it a rating of 4. The least popular evaluation method is NPV or discount with over 30% of the respondents assigning it a rating of 2. NPV or discount is the only evaluation method that managers assigned a rating of 1.

To determine if there were differences across geographic regions the ratings were separated by state as reported in Table 1. The results are very similar across the two states with a couple of notable exceptions. All four of the managers who assigned NPV a

rating of 1 were from Colorado cooperatives. Twice as many managers from Colorado assigned Simple a rating of 5 as Indiana managers.

To gain further insight into how managers rated evaluation methods correlations were performed. Table 2 presents the correlations for NPV, Simple, Payback and IRR. Since NPV and IRR both incorporate the time value of money it was expected that the correlation of these rating would be positive and large. Interestingly enough, the correlation between NPV and IRR was the only negative correlation in the table. The correlation was close to zero between NPV and Payback. The highest correlation, of 32%, was between IRR and Payback.

The general conclusion is that managers are making the most use of Payback, followed by Simple and IRR. NPV or discount is the least preferred method of business evaluation. Given the rapidly changing agricultural environment and the need to remain competitive these results are very interesting. Managers of locally owned cooperatives, in general, favor the evaluation methods that do not incorporate the time value of money. These results are in contradiction to the first hypothesis identified above.

## **Methodology**

Binary logit analysis was used to obtain insights into the second research question of “what factors influence the methods of valuation preferred by cooperatives when evaluating new business opportunities?” Binary logit analysis requires that the dependent variable take on a value of 0 or 1. In this analysis, a value of 1 was assigned if the manager had assigned a rating of 4 or 5 and a value of 0 was assigned otherwise. This was applied to each of the NPV, Payback, Simple and IRR methods.



To analyze these dichotomous choices, we used independent logit models based on the following logistic probability function:

$$(1) \quad P_i = F(Y_i) = \frac{1}{1 + e^{-Y_i}} = \frac{1}{1 + e^{-(\mathbf{a} + \mathbf{X}_i \mathbf{b})}},$$

where  $P_i$  is the probability that the  $i^{\text{th}}$  manager will assign a certain rating given the observed level of certain business characteristics contained in  $\mathbf{X}_i$ . Therefore, if (1) represents the probability the evaluation method is assigned a 1, then  $1 - P_i$  will be the probability:

$$(2) \quad 1 - P_i = \frac{1}{1 + e^{Y_i}}$$

As a consequence, if we want to estimate the odds ratio in favor of rating the evaluation method as a 1, then we need to calculate the ratio of both probabilities.

$$(3) \quad \frac{P_i}{1 - P_i} = \frac{1 + e^{Y_i}}{1 + e^{-Y_i}} = e^{Y_i} = e^{\mathbf{a} + \mathbf{X}_i \mathbf{b}}$$

When linearizing (3) by taking the natural log, we obtain the odds ratio in favor of those respondents choosing the preferred method to any specific question given  $\mathbf{X}_i$ , where  $\mathbf{X}_i$  is a  $(n \times K)$  matrix of business characteristics of the cooperative, such as size, “well-being”, and innovativeness. This can be shown as:

$$(4) \quad \text{Log} \left( \frac{P_i}{1 - P_i} \right) = Y_i = \mathbf{a} + \mathbf{X}_i \cdot \mathbf{b},$$

where  $Y_i$  is the dichotomous response ( $n \times 1$ ) vector related to a ( $n \times K$ ) matrix of observable explanatory variables  $\mathbf{X}_i$ . Notice that the meaning of the coefficients cannot be interpreted as the direct effects on the probability of favoring a particular business evaluation method; rather, they measure the change in the odds ratio by a change in a unit of  $X$ . However, the signs and statistical significance of the coefficients are of interest and what the discussion of the results will focus on.

It's convenient to remember that the underlying statistical model is based on a latent and continuous unobservable ( $Y_i^*$ ) variable unknown to the researcher, which in the context of the business evaluation analysis could be the general managers' views on alternative business evaluation methods. The observable variable, which is modeled by the researcher, is the response to the dichotomous choice. Thus, the latent model is represented by:

$$(5) \quad Y_i = I_{(0,\infty)}(Y_i^*), \quad \text{where } Y_i^* = \mathbf{a} + \mathbf{X}_i \cdot \mathbf{b} + e_i.$$

Therefore,

$$(6) \quad Y_i = \begin{cases} 1 \\ 0 \end{cases} \text{ iff } Y_i^* = \mathbf{a} + \mathbf{X}_i \cdot \mathbf{b} + e_i \begin{cases} > \\ \leq \end{cases} 0.$$

Notice that we are assuming that the  $e_i$  are iid unobservable random variables, which follow a logistic distribution with mean 0 and a variance of  $\pi^2 / 3$ .

## **Empirical Model Specifications**

To test the second and third hypotheses it was necessary to construct variables that represent the cooperative size, level of “well-being”, and innovativeness. For each of these variables the cooperatives were placed into one of three categories. The development of these variables is described in detail in the text below and summarized in Table 3.

Four measures that have been used to describe the size of a cooperative are sales, number of members, geographic area served, and number of different lines of business that the cooperative is involved in. Since cooperative size is multi-faceted an aggregate variable was calculated for size and used in the empirical analysis. The determination of the aggregate variable was a two-step process. First of all the cooperatives were grouped into the lowest third, the middle third, and the highest third for each of the variables of sales (in 1999), number of members, number of counties the cooperative does business in, and number of lines of business. For example a cooperative that was in the lowest third for sales received a score of 1 for Sales while a cooperative that was in the highest third for number of lines of business received a score of 3 for number of lines of business. At this stage each cooperative had a score of 1, 2, or 3 for each of the four measures of size. The second step involved aggregating these scores. A cooperative received a score for SIZE of 3 if it had a score of 3 for two or more of the measures. Cooperatives that had a score of 2 (or higher) for two or more of the size measures received a score of 2 for SIZE. The remaining cooperatives received a score of 1 for SIZE. SIZE was then incorporated into the binary logit analysis as two dummy variables (SIZEMED and SIZELRG), with the smallest size category left out.

An aggregation process, similar to the one described above was performed to construct the variables for “well-being.” The four variables used to describe a cooperative’s well-being were: level of profit in 1999, percentage of non-member business, equity redemption, and sales expectations for next five years. Profit is a commonly used measure of “well-being” and each firm was assigned a score for profit of 1, 2, or 3 based on which third it fell into. Non-member business is an important factor for the “well-being” of agricultural cooperatives in today’s competitive environment since the traditional agricultural business base is eroding as the number of farms decreases. Each cooperative was assigned a score of 1, 2, or 3 for non-member business based on which third it fell into. The cooperatives’ performance with respect to equity redemption was determined by asking managers to rate (on a 5-point scale) how well their cooperative is doing compared to other cooperatives in the state. Ratings for equity redemption of 4 or 5 were assigned a score of 3 for equity redemption. Ratings for equity redemption of 1 or 2 were assigned a score of 1 and a rating of 3 received a score of 2. Scores for sales expectations for the next 5 years were calculated as follows. Those cooperatives that expected sales to increase, stay the same, or decrease over the next 5 years received a score of 3, 2 or 1 respectively for sales. The aggregate score for “Well-Being” was then calculated in the same manner as described above. A cooperative received a score for Well-Being of 3 if it had a score of 3 for two or more of the measures. Cooperatives that had a score of 2 (or higher) for two or more of the “well-being” measures received a score of 2 for Well-Being. The remaining cooperatives received a score of 1 for Well-Being. Well-Being was then incorporated into the binary

logit analysis as two dummy variables (WELLBMID and WELLBTOP), with the smallest “well-being” category left out.

In this study the level of innovativeness of the cooperative was determined by evaluating the business’ use of computer and electronic commerce technology. The adoption of computer and electronic commerce technologies was used as the measure of innovativeness since, as noted by Vandeburg et. al. (2000b) information and communications technology represents one of the major areas of change currently facing agribusinesses. During the interviews each manager was asked to identify, from a list of 12 computer and electronic commerce technologies<sup>2</sup>, the ones that were used by the cooperative. Cooperatives that were in the top one-third with respect to the number of technologies used received a score of 3 for Innovativeness. Those that were in the middle and bottom third received scores of 2 and 1 respectively. Once again two dummy variables, INNOVMID and INNOVTOP are incorporated into the logit analysis with the lowest level of innovativeness left out.

In order to model the factors affecting the rating of NPV, Payback, Simple, and IRR as methods of business evaluation, the following logit model has been empirically estimated, for each evaluation method:

$$(7) \quad Y_i^* = a_1 + \beta_1 \text{SIZEMED}_i + \beta_2 \text{SIZELRG}_i + \beta_3 \text{WELLBMID}_i + \mathbf{b}_4 \text{WELLBTOP}_i + \mathbf{b}_5 \text{INNOVMID}_i + \mathbf{b}_6 \text{INNOVTOP}_i + e_i$$

---

<sup>2</sup> These included: Computerized Billing, Computerized Accounting System, Informational Web Page, Receive orders via web page, Use e-mail with farmer customers, Use e-mail with input suppliers and end-users, Electronic Newsletter, Place orders to suppliers via web, Plant operations, Cardtrol Fuel Pumps, GPS monitored Fuel Tanks, and Other.

where  $SIZEMED_i$  and  $SIZELRG_i$  represent, respectively, whether the  $i$ th cooperative scored in the middle or largest size categories.  $WELLBMID_i$  and  $WELLBTOP_i$  represent whether the cooperative received a score of 2 or 3 for “Well-Being” as described above. In a similar manner,  $INNOVMID_i$  and  $INNOVTOP_i$  represent whether the cooperative received a score of 2 or 3 for innovativeness. Notice that the dummy variables corresponding to the low-ends of the variables are being dropped from the model specification to avoid the “dummy variable trap.” This implies that the coefficients obtained must be interpreted relative to the lower-end or dummies excluded from the model.

## Results

Equation (7) was estimated independently for each of the four evaluation methods of NPV, Payback, Simple, and IRR. The results of the binary logit analysis are presented in Table 4. The four columns report the results for each of the four independent estimations for NPV, Payback, Simple and IRR respectively. The values below the coefficients, in parentheses, are t-statistics. The final row of the table reports the Chi-Squared statistic to check whether the set of coefficients, as a whole, are statistically different from zero.

The most noteworthy result is the overall lack of statistical significance for any of the estimations. The equation for Payback was the only one where the set of variables, as a whole, were statistically significant. In that equation the coefficients for  $SIZEMED$  and  $WELLBMID$  were statistically different from zero and had a positive sign. All of the coefficients, except for the constant, were positive in the equation for Payback,

suggesting that larger cooperatives, cooperatives with a higher level of “well-being” and cooperatives that are more innovative are more likely to rate Payback high. This is contrary to the hypothesis noted above.

In the remainder of the table only two other coefficients are statistically significant: WELLBMID in the NPV equation and WELLBMID in the IRR equation. In the NPV equation the WELLBMID has a negative sign which is contrary to the original hypothesis. The coefficient in the IRR equation is positive, as expected.

### **Conclusions and Suggestions for Further Study**

The two questions that this paper addressed were what methods of evaluation are cooperatives using when evaluating new business opportunities and what factors influence the methods of evaluation preferred by cooperatives? With respect to the first question it was hypothesized that cooperatives would be more likely to use NPV and IRR as compared with Payback and Simple. The results, as reported in Figure 1 and Table 1, contradict this first hypothesis. Payback is the most preferred method of evaluation, followed by Simple and IRR. NPV is the least preferred method of evaluation.

The second and third hypotheses, that followed from the second research question, were that cooperatives of larger size, a higher level of “well-being” and that are more innovative are more likely to use IRR and NPV and less likely to use Payback and Simple. It is not possible, from the results of this analysis, to suggest that the second and third hypotheses are supported. The results of the binary logit Payback equation directly contradict the third hypothesis. The general lack of statistical significance suggests that the second and third hypotheses can be neither supported or contradicted. These results

raised some concerns about the methods that managers are currently relying upon to make business investment decisions, and the reasons for these decisions.

The payback method may be the most popular amongst cooperative managers because it is very easy to understand. The manager simply gets that answer to the question: “when will I receive enough cash flow to pay for the initial investment or outflow?” Understanding discounting and time value of money can sometimes be a difficult thing and some managers would rather go with a “gut feel” or something they understand more readily. The explanation for IRR being preferred to NPV may be that people simply understand percentages better than a NPV (Gallagher, 1997).

Three possible factors may be contributing to the phenomenon of NPV being the least preferred method. First, decisions about many new business ventures must be made very quickly and managers do not have time to conduct and NPV evaluation. Second, cooperative managers many not understand how to do a discounting calculation for NPV and therefore find the entire process intimidating. Because of this, they do not have much confidence in the ending calculation—no matter who has calculated it. Finally some cooperative managers who do understand NPV evaluation may simply find it too complicated to explain to their Board of Directors and cooperative membership. It is important to remember that the Board of Directors and cooperative membership are farmers. Personal communication with agricultural lenders in Indiana revealed that farmers are not using discounting when evaluating their own business opportunities. Thus one would not expect these farmer members to embrace NPV analysis at the cooperative level.



Two areas exist for further study and analysis. First, additional qualitative analysis can be performed with information collected from the interviews. One of the open-ended questions that managers were asked was “What are some of the methods that your cooperative currently uses to value new business ventures?” A full text of the managers’ answers can be found in the tape recordings that were done of the interviews. While it would not be possible to perform statistical analysis from this qualitative information, important insights may be learned about the decision making process associated with new business ventures.

Secondly, bankers across the country, from both CoBank and investor oriented banks could be surveyed. In this survey of loan officers information could be collected concerning what types of analysis they require before approving loans and what practices are commonly undertaken.

Finally, the results reported here highlight an opportunity for educational programming for cooperative managers and directors around the country. First, cooperative managers and directors could benefit from educational programming that illustrates the role of each of the evaluation methods of NPV, Payback, Simple and IRR. Second, workshops that help cooperative managers and directors set up these types of analyses in a spreadsheet would be very beneficial. If directors and managers left one of these workshops with a template that they could insert numbers into the next time they had a project to evaluate there is a very good chance that they would start to use more effective evaluation methods.

**Table 1: Rating of Evaluation Methods: Frequency by State**

Valuation Method	Rating	Colorado		Indiana	
		Number of Responses	Percentage of Responses	Number of Responses	Percentage of Responses
NPV	1	4	12.5%	0	0.0%
	2	8	25.0%	10	37.0%
	3	12	37.5%	12	44.4%
	4	6	18.8%	3	11.1%
	5	2	6.3%	2	7.4%
Simple	1	0	0.0%	0	0.0%
	2	1	3.2%	0	0.0%
	3	8	25.8%	10	34.5%
	4	12	38.7%	14	48.3%
	5	10	32.3%	5	17.2%
Payback	1	0	0.0%	0	0.0%
	2	2	6.3%	0	0.0%
	3	2	6.3%	5	15.2%
	4	19	59.4%	15	45.5%
	5	9	28.1%	13	39.4%
IRR	1	0	0.0%	0	0.0%
	2	2	6.3%	1	3.4%
	3	7	21.9%	8	27.6%
	4	14	43.8%	15	51.7%
	5	9	28.1%	5	17.2%

**Table 2: Correlation Matrix for NPV, Simple Interest, Payback, IRR**

	<b>NPV</b>	<b>Simple</b>	<b>Payback</b>	<b>IRR</b>
<b>NPV</b>	1.00000	0.27837	0.01591	-0.2445
<b>Simple</b>	0.27837	1.00000	0.26225	0.12054
<b>Payback</b>	0.01591	0.26225	1.00000	0.32423
<b>IRR</b>	-0.02445	0.12054	0.32423	1.00000

**Table 3: Summary Statistics and Variable Description**

<b>Name</b>	<b>Description</b>	<b>Min, Max</b>	<b>Mean</b>	<b>Standard Deviation</b>
SIZEMED	Dummy variable equal to 1 if the cooperative was in the medium size category as measured by the aggregate of four size variables	(0,1)	0.414	0.447
SIZELRG	Dummy variable equal to 1 if the cooperative was in the largest size category as measured by the aggregate of four size variables	(0,1)	0.314	0.467
WELLBMID	Dummy variable equal to 1 if the cooperative was in the middle “Well-Being” category as measured by the aggregate of four Well-Being variables.	(0,1)	0.500	0.503
WELLBTOP	Dummy variable equal to 1 if the cooperative was in the top “Well-Being” category as measured by the aggregate of four Well-Being variables	(0,1)	0.242	0.431
INNOVMID	Dummy variable equal to 1 if the cooperative was in the middle innovativeness category	(0,1)	0.385	0.490
INNOVTOP	Dummy variable equal to 1 if the cooperative was in the top innovativeness category	(0,1)	0.271	0.447

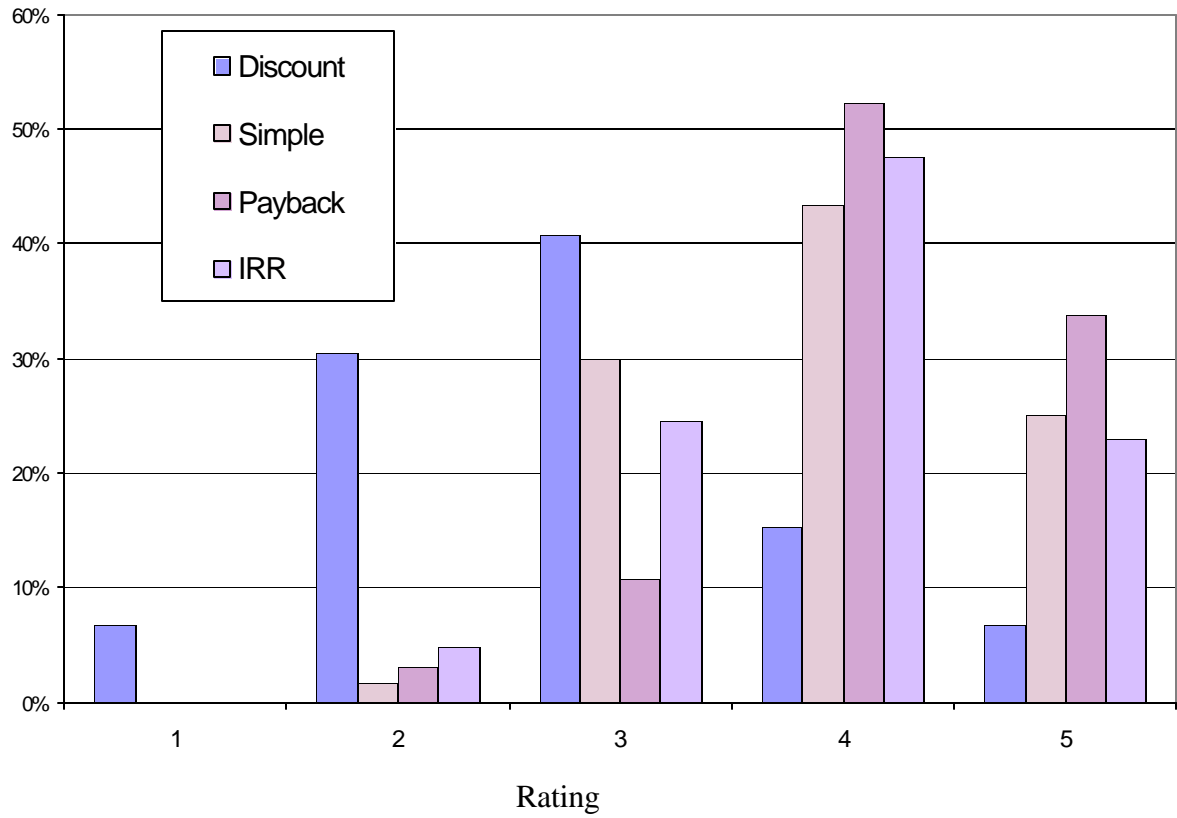
**Table 4: Binary Logit Regression Results**

<b>Variables</b>	<b>Y=NPV</b>	<b>Y=Payback</b>	<b>Y=Simple</b>	<b>Y=IRR</b>
<b>Constant</b>	-0.176 (-0.219) <sup>a</sup>	-0.475 (-0.528)	0.305 (0.401)	-0.273 (-0.371)
<b>Medium</b>	-0.770 (-0.852)	2.378 (1.882)*	0.617 (0.846)	0.007 (0.010)
<b>Large</b>	0.542 (0.532)	-0.262 (-0.206)	-0.249 (-0.290)	0.300 (0.321)
<b>AverBeing</b>	-1.456* (-1.750)	1.989* (1.879)	-0.351 (-0.476)	1.285* (1.776)
<b>GoodBeing</b>	-0.650 (-0.706)	0.466 (0.433)	0.651 (0.687)	0.283 (0.339)
<b>AverIT</b>	-0.507 (-0.571)	1.836 (1.583)	0.446 (0.617)	0.241 (0.340)
<b>HihgIT</b>	-0.162 (-0.162)	1.000 (0.754)	0.617 (0.713)	1.144 (1.221)
<b>% Correct Predictions</b>	77.97%	89.23%	66.66%	75.41%
<b>Chi-Squared (6)</b>	5.80	11.82*	3.97	6.61

<sup>a</sup> T-values are reported in parenthesis.

\* represents a statistical significance at  $\alpha = 0.1$  or below.

**Figure 1: Ratings of Business Valuation Methods**



## References:

- Boehlje, Michael. 1999. "Structural Changes in the Agricultural Industries: How Do We Measure, Analyze and Understand Them?" *American Journal of Agricultural Economics*. 81, 5. p. 1028-1041.
- Crooks, Anthony. 2000. "Consolidation in the Heartland." *Rural Cooperatives*, November/December. p. 14-19.
- Drabenstott, Mark. 2000. "A New Structure for Agriculture: A Revolution for Rural America." *Journal of Agribusiness*, 18, 1 p. 61-70.
- Fulton, Joan R. 2001. "Structural Change in the Agricultural Marketplace." Presentation at Co-op Night, Marketplace of Idea, Bismark North Dakota. January.
- Fulton, Joan R., Michael P. Popp, and Carolyn Gray. 1996. "Strategic Alliance and Joint Venture Agreements in Grain Marketing Cooperatives." *Journal of Cooperatives*. 11, pp. 1-14.
- Gallagher, Timothy J. and Joseph D. Andrew, Jr. 1997. *Financial Management: Principles and Practice*. Prentice-Hall, Inc.
- Greene, W.H, 1997. *Econometric Analysis*. Prince-Hall Inc.
- Merlo, Catherine. 1998. "When Cooperatives Combine." *Rural Cooperatives*, September/October. P. 18-23.
- Parliament, Claudia and Jodi Taitt. 1989. "Mergers, Consolidations, Acquisitions: Effect on Performance in Agricultural Cooperatives." Staff Paper P89-37. Department of Agricultural and Applied Economics, University of Minnesota.
- Reynolds, Bruce. 1995. "Specialization Networks Offer Alternative to Consolidation of Local Cooperatives." *Farmer Cooperatives*. February, pp. 14-16.
- Vandeburg, Jennifer, Joan R. Fulton, Susan Hine, and Kevin McNamara, 2000. "Driving Forces and Success Factors for Mergers, Acquisitions, Joint Ventures, and Strategic Alliances among Local Cooperatives" Paper presented at NCR 194 (Research on Cooperatives) Annual Meeting, Las Vegas, NV. December. <http://www.agecon.ksu.edu/accc/ncr194/publications.htm>
- Vandeburg, Jennifer, Joan R. Fulton, Susan Hine, and Kevin McNamara, 2000. "What do Locally Owned Cooperatives in Indiana Look Like?" *Purdue Agricultural Economics Report*. December. p. 5-8. <http://www.agecon.purdue.edu/ext/paer/>