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Title: ***The Future Viability of the Federated Structure***

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1. Introduction

There has been a substantial amount of research conducted recently on the changing structure of agriculture. During the past century, gains in farming efficiency and access to capital, both public and private, helped create a pronounced agricultural trend: fewer and larger farmers (USDA). In 1970 the average farm size was roughly 400 acres. By 1997 the average size had jumped to almost 500 acres. During the same period, farm numbers declined from approximately 2.8 million to slightly less than 2 million. Not surprisingly perhaps, structural change has also occurred within the agricultural cooperative sector. The rise of closed, value-added (new generation) cooperatives has been a very visible example in the 1990s (Harris, Stefanson, and Fulton). Dramatic increases in mergers, joint ventures, acquisitions, and strategic alliances amongst cooperatives and between cooperatives and investor-oriented firms (IOFs) also continue to epitomize cooperative structural change (Richards and Manfredo; Wadsworth).

Within the federated cooperative structure system, both regional and local co-ops have increased in size (mostly through mergers). In a recent series of USDA-organized focus groups, cooperative leaders across the US were asked to identify what they considered to be the primary challenges facing the cooperative structure. The relevance and future viability of the traditional federated structure was a frequently raised issue (Frederick et al.). The federated cooperative system provides economies of scale and scope to individual farms. The regional cooperative services local cooperatives, which in turn help their farm members (see Figure 1).

Some local cooperatives have now grown as large as some regionals were in the late 1950s, raising a few important issues. One question that emerges is whether these

larger locals need a second-tier regional structure or whether they can capture the same or more benefits on their own. An alternative strategy would be to increase the size and scope of regional cooperatives. In fact, some regionals have merged and/or entered into joint ventures, and others have organized inter-regionals (e.g., CF Industries), hoping to capture economies of size and pass these benefits on to their local members. Whether these larger regional business structures have succeeded in doing so has yet to be subjectively assessed.

USDA Rural Business Cooperative Service (RBCS) has tracked many of the cooperative consolidations and issued useful statistical reports on membership size and business volume (Kraenzle, et al.; Wadsworth). However, the satisfaction of local cooperatives with their regional federated cooperatives has not been analyzed. Their satisfaction, while subjective, is also clearly dependent on need. For what are local cooperatives using their regionals? In some instances, are they duplicating services? How has their relationship been affected by changes at the local level (e.g., growth in members, growth in products, etc.)? To answer these questions, a comprehensive survey was sent to over 600 federated grain marketing and farm supply cooperatives in Illinois, Iowa, Minnesota, and Wisconsin. The results were analyzed using standard regression techniques.

2. Methodology

Data was collected through a survey mailed out to 608 local grain and farm supply cooperatives in the Midwest in August 2002, and again in January 2003. Surveys were sent to 176 cooperatives in Illinois, 104 in Iowa, 233 in Minnesota, and 95 in Wisconsin. Cooperative mailing lists were received from cooperative associations in

each state: the Iowa Institute for Cooperatives, the Wisconsin Federation of Cooperatives and the University of Wisconsin Center for Cooperatives, the Minnesota Association of Cooperatives, and the Illinois State Office of USDA Rural Development. Fourteen blank surveys were returned with indications that the firm in question was not a cooperative, had gone out of business, or had merged with another cooperative. A total of 113 useable surveys were ultimately received, achieving a final response rate of 19 percent. This rather low response rate was caused by the comprehensive nature of the survey (13 pages). Although more responses would clearly have been better, the data does provide a nice sample across the four states and substantial information on the subject of the federated structure. [Julie Hogeland's survey]

Of the total responses received from local cooperatives, 20 percent were from Illinois (23), 21 percent from Iowa (24), 39 percent came from Minnesota (43), and 20 percent from Wisconsin (23). A majority of the respondents were in management positions at the local cooperatives: 86 percent were a General Manager or CEO, 12 percent were in other management positions. Another 2 percent held other staff positions at the cooperative.

Questions in the survey elicited information about two main areas: changes in the size and structure of local cooperatives between 1990 and 2001 and business activities with regional cooperatives. Further questions asked for more qualitative statements about past and future changes within the cooperative and about the local cooperatives' relationships with regional cooperatives.

2.1 Survey Results

Overall, local cooperatives reported significant sales growth (in both nominal and real terms) and increases in consumer members, with more modest increases in the number of producer members during 1990-2001. As shown in Table 1, total gross business sales increased in all four states by at least 50%. Local cooperatives in Minnesota experienced the greatest sales growth at 80%. These significant sales increases may be explained in part by the dramatic growth in consumer members. In all four states, the majority of co-ops that reported having consumer members increased this membership population during 1990-2001. The change in average consumer membership numbers ranged from 33% (Iowa) to 78% (Illinois). This trend reflects the growing number of non-farm families residing in rural towns and a subsequent increase in consumer orientation by local cooperatives.

In contrast, the average number of producer members increased modestly in Illinois and Minnesota (3.2% and 3.1% respectively) and actually decreased by almost 20% in Wisconsin. Iowa was the only state where locals reported a more significant growth in producer members (32%). Interestingly though, the percentage of locals that reported an increase in actual producer membership numbers ranged from 19% (Minnesota) to 65% (Iowa). The average farm size of the producer members has increased steadily across all four states, with the largest increases in Minnesota (78%) and Iowa (83%) (see table 3). And while it increased slightly, the distance of the farthest member served did not change dramatically (table 3). [Compare results to Census # on farm numbers for same period by state.]

The premise that sales growth in local cooperatives was generated by consumer membership growth is supported by two other findings. In all four states, nearly 50% or more of the locals increased the number of products and services they offered to their members during 1990-2001. Further, as reported in table 2, the largest percentage changes in gross business sales by sector were in consumer goods (258%), other farm supplies (131%), and "other" (132%). The growth in sales may also be attributed to the locals engaging in mergers, acquisitions, joint ventures, or strategic alliances. The percentage of locals that engaged in this type of activity ranged from 65% (Illinois) to 91% (Iowa) (see table 1).

The local cooperatives reported being members of a number of different regional cooperatives although the four most common were CHS (Cenex-Harvest States), Farmland Industries, Growmark, and Land O' Lakes. Fifty-four percent of all local cooperatives listed multiple regional memberships (tables 4-7).

To elicit information about the relevance of the federated structure system, local cooperatives were asked to rate their satisfaction with each regional in which they reported membership. Possible responses were Very Satisfied, Somewhat Satisfied, or Not Satisfied, and related to each of three categories: prices, products, and services. While these separate categories will be taken up in later analysis, Table 8 displays total satisfaction percentages for each regional by state (focusing only on the largest regionals). On average, locals are moderately satisfied with regionals, with 48 percent of all responses falling under Somewhat Satisfied, and the remainder almost equally split between Very Satisfied and Not Satisfied. Farmland, which recently filed for

bankruptcy, garnered the highest percentage of unsatisfied members (29.2). CHS won the most praise, with 20.7 percent of members reporting to be Very Satisfied.

3. Econometric Model Specification

An ordered probit approach was used to analyze the hypothesis that local cooperative growth (e.g., sales and membership growth, an increased number of products and services offered, and merger activity) will have a significant and negative effect on local cooperative satisfaction with their regionals. This approach uses maximum likelihood estimation methods to find the probabilities that a particular ranked outcome will be observed. Under this model the probabilities of a local achieving a level of satisfaction with a regional are determined by a set of explanatory variables with unknown parameters. It is specified as follows:

$$Y = \beta_0 + \beta_i X_i + \varepsilon, \;\; i = 1,2,...k. \tag{1}$$

We observe $Y = 0$ if the local was not satisfied with the regional, $Y = 1$ if the local was somewhat satisfied, $Y = 2$ if the local was very satisfied. The probabilities of observing these categories are (Inlow):

$$\Pr(Y = j) = \Phi(\mu_{j+1} - \beta_i X) - \Phi(\mu_j - \beta_i X) \tag{2}$$

where μ refers to the cut points between satisfaction categories in the cumulative distribution function (CDF), and j = 0, 1, 2. Cut points are estimated along with parameters of the model, with $\mu_0 = -\infty$ and $\mu_3 = \infty$.

Since local cooperatives were asked to rate their satisfaction with each regional in three categories (prices, products and services), three separate probit models were estimated. Further, as noted above, most local cooperatives reported on multiple

regionals. For the model estimation each regional response was treated separately. Therefore, there were 247 data points in the model while there are only 113 total surveys.

Prices Model[1]

$$Y_{PRICE,i} = \beta_1 GROWTH + \beta_2 DUPLICATE + \beta_3 INPUT + \beta_4 MERGED + \beta_5 PSCHG + \beta_6 PRDCHG + \beta_7 PATRON + \beta_8 FDUM * PATRON + \beta_9 GDUM * PATRON + \beta_{10} CDUM * PATRON \quad (3)$$

where Y_{PRICE} refers to local cooperative satisfaction level with prices of regionals, and i denotes which regional (Farmland, Growmark, CHS or Land O'Lakes).

Products Model

$$Y_{PROD,i} = \beta_1 GROWTH + \beta_2 DUPLICATE + \beta_3 INPUT + \beta_4 MERGED + \beta_5 PSCHG + \beta_6 PRDCHG + \beta_7 PATRON + \beta_8 FDUM * PATRON + \beta_9 GDUM * PATRON + \beta_{10} CDUM * PATRON \quad (4)$$

where $Y_{PROD,i}$ refers to local cooperative satisfaction level with products of regionals.

Services Model

$$Y_{SERV,i} = \beta_1 GROWTH + \beta_2 DUPLICATE + \beta_3 INPUT + \beta_4 MERGED + \beta_5 PSCHG + \beta_6 PRDCHG + \beta_7 PATRON + \beta_8 FDUM * PATRON + \beta_9 GDUM * PATRON + \beta_{10} CDUM * PATRON \quad (5)$$

where $Y_{SERV,i}$ refers to local cooperative satisfaction level with services of regionals.

- $GROWTH$ = 1 if the local co-op has experienced sales growth between 1990 and 2001 and 0 otherwise;
- $DUPLICATE$ = 1 if the local believes that regionals are duplicating services of the local and 0 otherwise (this is not specific to any particular regional, but reveals a general attitude about regionals);

[1] In these models the intercept was assumed to be zero, differing from Greene's presentation, which includes an intercept but assumes the first cut point to be zero. For further discussion of this difference, refer to Gould, 1999 and Inlow, 1999.

- *INPUT* = 1 if the local believes they have sufficient input and control into the operation of the regional and 0 otherwise;
- *MERGED* = 1 if the local has engaged in any merger/acquisition, strategic alliance or joint venture activities between 1990 and 2001 and 0 otherwise;
- *PSCHG* = 1 if the local offered more products and services in 2001 than in 1990 and 0 otherwise;
- *PRDCRCHG* = 1 if the local reported an increase in the number of producer members between 1990 and 2001 and 0 otherwise;
- *PATRON* refers to the amount of patronage refunds received from a regional on average in the past five years.
- *FDUM*, *GDUM*, and *CDUM* each = 1 if the observation's satisfaction level refers, respectively, to the regionals Farmland, Growmark, and CHS, and = 0 otherwise; dropping Land O'Lakes to avoid matrix singularity transfers its effect onto the base variable, *PATRON*. These three dummy variables were multiplied by *PATRON* to separate the effects of each regional's patronage refunds on satisfaction.

4. Regression Results

Tables 9, 10 and 11 show the results of the ordered probit regression analyses for prices, products and services respectively, listing estimated coefficients, their standard errors and marginal effects. As a measure of robustness of the model, likelihood ratio test statistics for all three regressions are significant, allowing a rejection of the null hypothesis that the vectors of exogenous variables are not significantly different from zero, and percent of correct predictions was above 60% for all three. No evidence of major multicollinearity between exogenous variables was found (see appendix).

Results from the price satisfaction regression show that four factors have a significant impact. Counter to the hypotheses of this study, three of the impacts that were expected to have a negative affect on satisfaction instead had a positive affect. Contrary to the expectation that growth would cause a local to be less satisfied with regionals, those that experienced an increase in sales between 1990 and 2001 (*GROWTH*) were 3 percent more likely to be very satisfied with their regional, and 8 percent more likely to be somewhat satisfied. Also countering a hypothesis of this study, if a local believed that

regionals duplicated their own services (*DUPLICATE*) they were actually 4 percent more likely to be very satisfied and 9 percent more likely to be somewhat satisfied with the regional. Another interesting result is that an increase in the number of products and services offered by a local cooperative (*PSCHG*), resulted in 4 percent higher likelihood of being very satisfied, and an 8 percent higher likelihood of being somewhat satisfied. As hypothesized, growth in the number of producer members in a local co-op (*PRDCHG*), however, had a negative impact on satisfaction with regional prices, decreasing the chance of being somewhat satisfied by 15 percent and causing a 20 percent higher chance that the local was not satisfied. Level of input and control in regionals (*INPUT*) and merger activity (*MERGED*) were not significant factors of satisfaction, and level of patronage refunds from the four different regionals also had no influence on satisfaction with prices.

In terms of products, satisfaction with regionals was significantly influenced by three factors. Surprising again is the result that the duplication of local services by regionals (*DUPLICATE*) made locals 37 percent more likely to be very satisfied. Growth in producer membership had the expected negative affect on satisfaction, as in the price model. An increase in the number of producer members (*PRDCHG*) resulted in a local being 46 percent less likely to be very satisfied with a regional's products, 37 percent more likely to be somewhat satisfied and 10 percent more likely to be not satisfied. Also, in the area of products, one regional in particular, Farmland, had an effect on satisfaction through its level of average annual patronage refunds (*FDUM*PATRON*). Farmland

members were 45 percent less likely to be very satisfied because of patronage levels, 35 percent more likely to be somewhat satisfied, and 10 percent more likely to be not satisfied with Farmland's products. In the product model, sales (*GROWTH*) and product/service line growth (*PSCHG*) had no significant influence on satisfaction, nor did level of input and control or merger activity.

Satisfaction with a regional's services also proved to be significantly affected by three factors. Once again, duplication of services (*DUPLICATE*) caused an increase in the likelihood of a local being very satisfied (25 percent), and a decrease in the likelihood of being not satisfied (21 percent). Also, engagement in merger activity (*MERGED*) had a significant impact on satisfaction, making locals 9 percent more likely to be very satisfied with a regional's services, 1 percent less likely to be somewhat satisfied, and 7 percent less likely to be not satisfied. An increase in number of producer members (*PDCRCHG*) again decreased a local's likelihood of being very satisfied with a regional, this time by 29 percent, and increased their likelihood of not being satisfied by 24 percent. As in the services model, growth in sales (*GROWTH*) and in product/service line (*PSCHG*) did not significantly influence local's satisfaction levels, nor did their sense of input and control in regional operations (*INPUT*). Patronage refunds from the individual regionals (*PATRON*) also did not prove to be a factor of satisfaction with services.

5. Conclusion

The cooperative sector has not been immune to the dramatic structural changes in agriculture over the past decades. Consolidation through mergers, acquisitions, strategic alliances and joint ventures has resulted in the unprecedented growth of local and

regional cooperatives, causing many to call into question the relevance and future viability of the federated structure that ties them together. To the extent that it is affected by these structural changes, the level of satisfaction that local cooperatives have with their regional cooperatives provides some insight into this question. Determining the specific factors influencing satisfaction sheds light onto the places where structural change is putting pressure on the current system, revealing areas where further research may flesh out ways to overcome these difficulties.

The hypotheses taken up by this paper held that specific changes occurring in local cooperatives, beliefs about their relationships with regional cooperatives, and financial benefits they receive from membership in regionals would significantly influence their satisfaction with regionals. Only two of these hypothesized factors consistently showed significant influence on satisfaction among all three areas of prices, products and services: duplication of services (*DUPLICATE*) and increase in number of producer members (*PDCRCHG*). Both were expected to have a negative impact on satisfaction, but *DUPLICATE*, in each category, had a positive impact, increasing the likelihood of being very satisfied with a regional by at least 25 percent in Products and Services. Also interesting were the results that sales and product/services line growth (*GROWTH* & *PSCHG*) increased the chance that a local was very satisfied with a regional's prices, and that engagement in merger activity (*MERGED*) made locals more likely to be very satisfied with a regional's services. These contrasts show that structural changes may be having an impact that is different than expected. Expanded membership base of locals seems to have a different effect on satisfaction than does other kinds of growth and expansion.

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Appendix

Correlation Matrix of Satisfaction Factors

Satisfaction Factors										
GROWTH	1.0000									
DUPLICATE	-0.1491	1.0000								
INPUT	-0.0815	-0.3202	1.0000							
PSCHG	-0.0628	0.0681	-0.0885	1.0000						
MERGED	-0.1615	0.1144	0.2403	-0.1110	1.0000					
PRDCHG	0.0212	0.1820	-0.1962	0.3908	-0.3369	1.0000				
PATRON	0.1272	-0.2206	0.1549	0.0090	-0.1717	0.1852	1.0000			
*FDUM*PATRON*	0.0949	-0.1140	-0.0519	0.1328	-0.0894	0.0692	0.0193	1.0000		
*GDUM*PATRON*	0.0670	-0.0121	0.0089	-0.0836	-0.0995	-0.0904	0.0727	-0.0394	1.0000	
*CDUM*PATRON*	0.0576	-0.1552	0.1288	-0.0326	-0.0901	0.0309	0.3324	-0.0942	-0.0802	1.0000

Figure 1. The Federated Structure

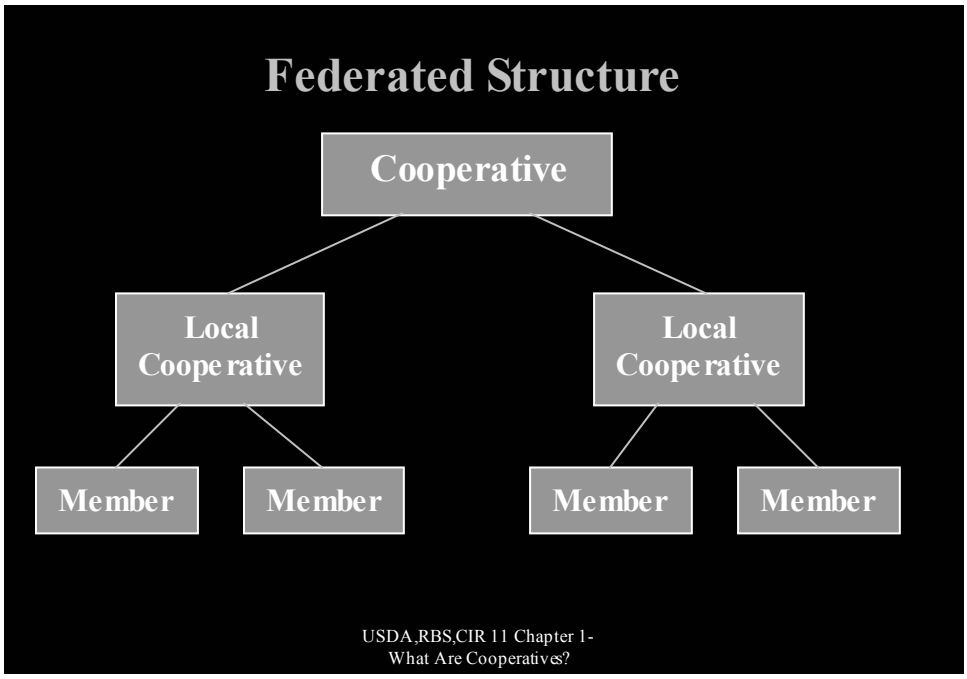

Table 1. Changes in Local Cooperative Size, 1990-2001					
	Illinois	Iowa	Minnesota	Wisconsin	Total
Gross sales ($ mill. 1990)					
1990					
Total	260.8	344.3	389.7	117.7	1,112.5
Mean	16.3	16.4	10.8	5.9	
1995					
Total	382.8	407.0	499.7	144.2	1,433.7
Mean	20.1	18.5	13.5	6.9	
2001					
Total	429.5	514.5	701.6	193.0	1,838.6
Mean	20.5	22.4	18.0	9.2	
% change in total (1990-2001)	64.7%	49.4%	80.1%	64.0%	65.3%
Products & Services					
% of locals that increased # of products & services	48%	63%	56%	52%	
Average # of members					
Producers					
1990	1,923	742	580	509	
1995	2,276	777	581	443	
2001	1,985	982	598	411	
% change in average (1990-2001)	3.2%	32.3%	3.1%	-19.2%	
% of locals that increased # [1]	33%	65%	19%	27%	
Consumers					
1990	1,773	700	972	1,406	
1995	2,086	743	964	1,707	
2001	3,155	934	1,407	2,212	
% change in average (1990-2001)	78.0%	33.3%	44.8%	57.3%	
# of locals that reported consumer members	7	18	23	19	
# of locals that increased members[1]	5	12	16	12	
Merger activity[2]					
% of locals	65%	91%	70%	68%	

1. Change from 1990-2001.
2. Refers to engaging in mergers, acquisitions, joint ventures, or strategic alliances.

Table 2. Changes in Gross Business Sales for all Four States, 1990-2001 Thousands of dollars ($ 2001)				
	1990	1995	2001	% change 1990 - 2001
Crop chemicals				
Average	1,214	1,544	1,881	55%
Standard deviation	1,828	2,142	2,803	-.-
Minimum	0	0	0	-.-
Maximum	12,206	13,972	15,321	26%
No. of co-ops	69	74	82	
Fertilizer				
Average	1,516	1,763	2,422	60%
Standard deviation	2,007	2,873	4,062	-.-
Minimum	0	0	0	-.-
Maximum	13,563	24,451	25,000	84%
No. of co-ops	69	74	77	
Services				
Average	614	751	1,002	63%
Standard deviation	1,576	1,530	1,613	-.-
Minimum	0	0	0	-.-
Maximum	14,376	13,041	10,082	-30%
No. of co-ops	75	80	83	
Feed				
Average	1,760	2,020	2,184	24%
Standard deviation	2,977	3,408	4,094	-.-
Minimum	0	0	0	-.-
Maximum	13,563	17,066	21,426	58%
No. of co-ops	66	69	71	
Petroleum				
Average	2,050	2,222	3,787	85%
Standard deviation	2,577	2,765	5,690	-.-
Minimum	0	0	0	-.-
Maximum	14,919	15,137	37,983	155%
No. of co-ops	67	72	77	
Grain marketing				
Average	7,892	10,630	11,448	45%
Standard deviation	11,835	19,657	20,134	-.-
Minimum	0	0	0	-.-
Maximum	48,007	139,838	135,851	183%
No. of co-ops	52	58	69	

Consumer goods				
Average	257	385	919	258%
Standard deviation	655	1,071	3,365	-.-
Minimum	0	0	0	-.-
Maximum	4,069	8,150	29,500	625%
No. of co-ops	31	38	45	
Other farm supplies				
Average	349	609	805	131%
Standard deviation	995	3,099	3,970	-.-
Minimum	0	0	0	-.-
Maximum	8,138	30,007	39,444	385%
No. of co-ops	55	59	62	
Other				
Average	188	234	436	132%
Standard deviation	414	483	843	-.-
Minimum	0	0	0	-.-
Maximum	2,364	2,354	5,000	112%
No. of co-ops	33	40	48	
Note: Some of the cooperatives sell only one of the product or service, others sell several.				

Table 3. Local Co-op Member Characteristics, 1990-2001					
	Illinois	**Iowa**	**Minnesota**	**Wisconsin**	**Total**
Avg. Farm Size (acres)					
1990	626.8	455.3	542.8	227.6	
Min	180	240	160	80	
Max	1,400	750	1,500	800	
1995	964.0	588.4	715.1	245.0	
Min	215	300	160	50	
Max	1,400	875	2,000	400	
2001	971.9	834.5	965.3	370.0	
Min	305	450	200	80	
Max	1,600	1,500	3,500	1,000	
% change in average	55.0%	83.3%	77.8%	62.6%	
Avg. Dispersion[1]					
1990					
Min					
Max					
1995					
Min					
Max					
2001					
Min					
Max					
% change in average					
1. Location of farthest member from cooperative (miles)					

Table 4. Regional Membership in Illinois	
Farmland	9
LOL	5
Growmark	14
CHS	6
AGRI	0
AGP	0
Agland	0
Agriliance	1
Others	10

Table 5. Regional Membership in Iowa	
Farmland	20
LOL	22
Growmark	8
CHS	21
AGRI	11
AGP	13
Agland	0
Agriliance	1
Others	18

Table 6. Regional Membership in Minnesota	
Farmland	22
LOL	35
Growmark	0
CHS	36
AGRI	1
AGP	7
Agland	0
Agriliance	5
Others	21

Table 7. Regional Membership in Wisconsin	
Farmland	16
LOL	16
Growmark	1
CHS	21
AGRI	2
AGP	0
Agland	0
Agriliance	4
Others	12

Table 8. Local Satisfaction with Regionals by State.

		Regional			
State	**Rating**	**CHS**	**Farmland**	**Growmark**	**Land O' Lakes**
Illinois					
	Memberships Reported	7	9	14	5
	Very Satisfied	4.8%	0.0%	16.7%	13.3%
	Somewhat Satisfied	33.3%	22.2%	45.2%	46.7%
	Not Satisfied	9.5%	22.2%	9.5%	20.0%
Iowa					
	Memberships Reported	20	19	6	20
	Very Satisfied	20.0%	12.3%	44.4%	18.3%
	Somewhat Satisfied	56.7%	24.6%	77.8%	50.0%
	Not Satisfied	11.7%	29.8%	5.6%	10.0%
Minnesota					
	Memberships Reported	37	22	0	33
	Very Satisfied	27.9%	0.0%	0.0%	16.2%
	Somewhat Satisfied	59.5%	83.3%	0.0%	41.4%
	Not Satisfied	8.1%	16.7%	0.0%	7.1%
Wisconsin					
	Memberships Reported	22	16	1	16
	Very Satisfied	30.3%	4.2%	0.0%	27.1%
	Somewhat Satisfied	54.5%	20.8%	100.0%	56.3%
	Not Satisfied	10.6%	47.9%	0.0%	10.4%
Total					
	Memberships Reported	86	66	21	74
	Very Satisfied	20.7%	4.1%	15.3%	18.7%
	Some Satisfied	51.0%	37.7%	55.8%	48.6%
	Not Satisfied	10.0%	29.2%	3.8%	11.9%

Table 9. Model of Local Cooperative's Satisfaction with Prices of Regional Cooperatives

Dependent Variable: ***0 =Not Satisfied, 1=Somewhat Satisfied, 2=Very Satisfied***

Variable		Estimated Coefficient	Standard Error	Marginal Effect Evaluated at Means YPRICE = 0	YPRICE = 1	YPRICE = 2
Cut Points	μ1	0.3329	0.9215	0.08977	-0.08977	0
	μ2	3.00933	0.9621	0	0.24127	-0.24127
GROWTH		0.465*	0.3153	-0.1254	0.08812	0.03728
DUPLICATE		0.51365*	0.3161	-0.13852	0.09733	0.04118
INPUT		-0.24611	0.313	0.06637	-0.04664	-0.01973
PSCHG		0.46353**	0.2824	-0.125	0.08784	0.03716
MERGED		-0.06424	0.4322	0.01732	-0.01217	-0.00515
PRDCHG		-0.77471***	0.3052	0.20892	-0.1468	-0.06211
PATRON		0.0629	0.2319	-0.01696	0.01192	0.00504
*FDUM*PATRON*		-0.91666	0.7494	0.2472	-0.1737	-0.07349
*GDUM*PATRON*		-0.40854	0.596	0.11017	-0.07742	-0.03275
*CDUM*PATRON*		0.19537	0.2536	-0.05269	0.03702	0.01566

Likelihood Ratio Chi-Square: 19.22** with 10 d.f.
Percent Correctly Predicted: 74.25

n = 110
* = significant at 10% level
** = significant at 5%
*** = significant at 1%

Table 10. Model of Local Cooperative's Satisfaction with Products of Regional Cooperatives

Dependent Variable: ***0 =Not Satisfied, 1=Somewhat Satisfied, 2=Very Satisfied***

Variable		Estimated Coefficient	Standard Error	Marginal Effect Evaluated at Means		
				YPROD = 0	YPROD = 1	YPROD = 2
Cut Points	μ1	-1.20617	1.002	-0.10437	0.10437	0
	μ2	0.82504	0.9495	0	0.31623	-0.31623
GROWTH		-0.12718	0.4374	0.01101	0.03774	-0.04875
DUPLICATE		0.97191***	0.2999	-0.0841	-0.28842	0.37253
INPUT		-0.07203	0.342	0.00623	0.02138	-0.02761
PSCHG		0.11472	0.4186	-0.00993	-0.03404	0.04397
MERGED		-0.1067	0.297	0.00923	0.03166	-0.0409
PRDCHG		-1.20219**	0.4259	0.10403	0.35676	-0.46079
PATRON		0.02125	0.1432	-0.00184	-0.00631	0.00814
*FDUM*PATRON*		-1.17507*	0.7941	0.10168	0.34871	-0.45039
*GDUM*PATRON*		-0.25545	0.5044	0.0221	0.07581	-0.09791
*CDUM*PATRON*		0.16108	0.1766	-0.01394	-0.0478	0.06174

Likelihood Ratio Chi-Square: 40.17*** with 10 d.f.
Percent Correctly Predicted: 66.67

n = 99

* = significant at 10% level	1.282
** = significant at 5%	1.645
*** = significant at 1%	2.326

Table 11. Model of Local Cooperative's Satisfaction with Services of Regional Cooperatives

Dependent Variable: ***0 =Not Satisfied, 1=Somewhat Satisfied, 2=Very Satisfied***

Variable		Estimated Coefficient	Standard Error	Marginal Effect Evaluated at Means		
				YSERV = 0	YSERV = 1	YSERV = 2
Cut Points	μ1	0.01817	0.7661	0.00426	-0.00426	0
	μ2	1.8923	0.787	0	0.52886	-0.52886
GROWTH		0.1093	0.3194	-0.02564	-0.00491	0.03055
DUPLICATE		0.89662***	0.2958	-0.21035	-0.04024	0.25059
INPUT		-0.22727	0.2993	0.05332	0.0102	-0.06352
PSCHG		-0.12218	0.354	0.02866	0.00548	-0.03415
MERGED		0.30872*	0.2115	-0.07243	-0.01386	0.08628
PRDCHG		-1.04142***	0.3173	0.24432	0.04674	-0.29106
PATRON		0.03126	0.1596	-0.00733	-0.0014	0.00874
*FDUM*PATRON*		-0.86763	0.6892	0.20355	0.03894	-0.24249
*GDUM*PATRON*		0.14794	0.5792	-0.03471	-0.00664	0.04135
*CDUM*PATRON*		0.05081	0.2166	-0.01192	-0.00228	0.0142

Likelhood Ratio Chi-Square: 26.6*** with 10 d.f.
Percent Correctly Predicted: 62.38

n = 101
* = significant at 10% level
** = significant at 5%
*** = significant at 1%