Departmental Savings and Loss Characteristics for 12 Locally Owned Farmer Cooperatives, 1985

Donald L. Van Dyne and V. James Rhodes

Department of Agricultural Economics
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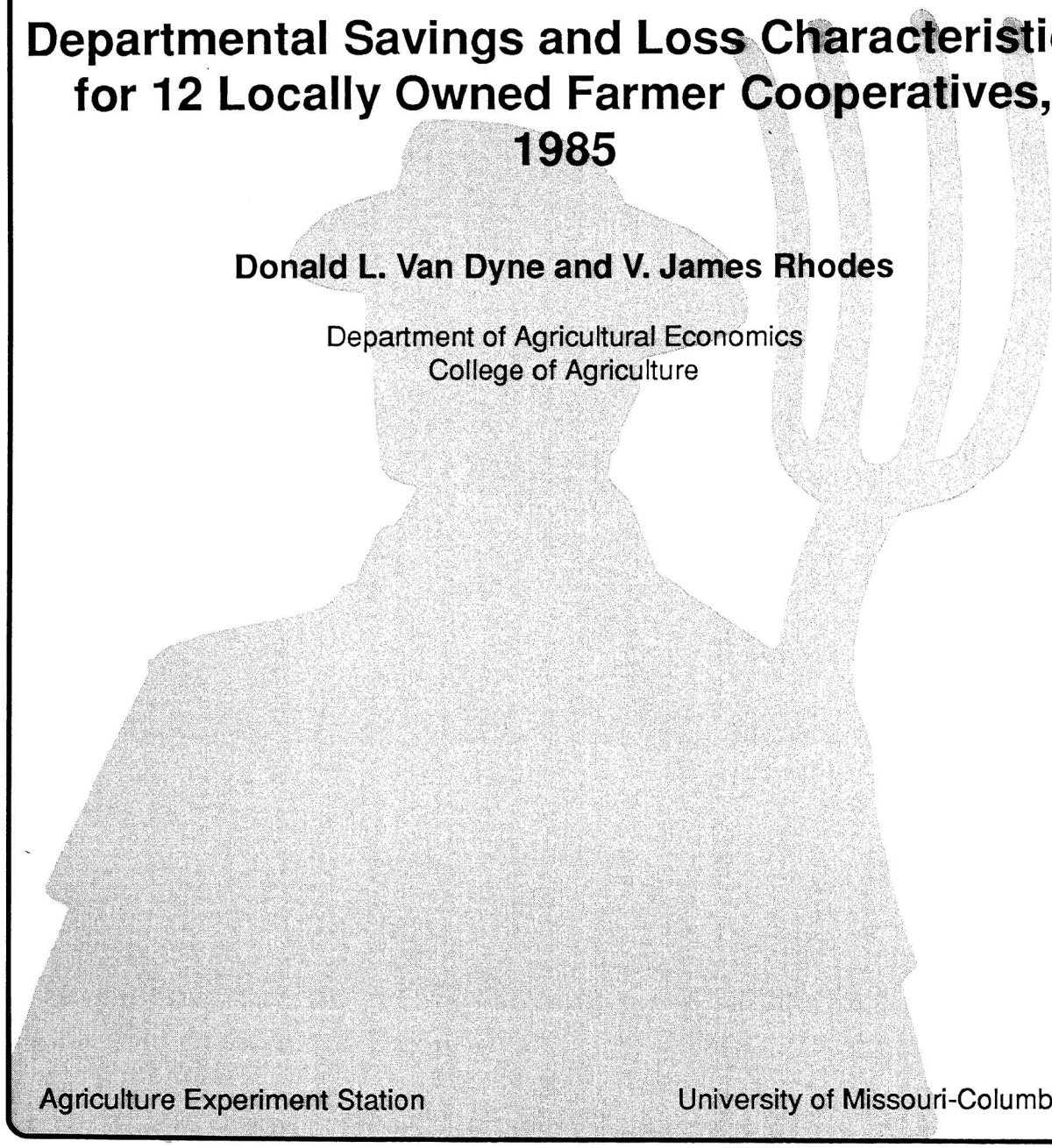

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Summary and Conclusions

Co-op managers have traditionally used gross margins as a measure of profitability. They are readily available from the annual audit and when compared to industry wide averages, provide an approximation of individual performance. Few co-ops go to the extra work of estimating expenses and net savings by departments. Abnormally low margins are frequently a good indicator of departmental losses. For example, a co-op grossing one percent in petroleum or 6 percent in chemicals (table 8) would likely not expect to make any net earnings in that department. But this study of the 12 locally owned co-ops indicates that it is helpful to go further. The difference between earnings and losses in feed, for example, appears to stem much more from differences in expenses than in gross margins. Low volume sales in a department are frequently associated with high expense to sales ratios.

Departmental analysis showed that no department was a loser in the entire group nor was any a winner (net savings) in every case. However, the record among departments was quite different. The most frequent losers were farm supplies (9 of 12 co-ops), grain (6 of 9 co-ops), anhydrous ammonia (4 of 6), feed (6 of 12), and chemicals (4 of 8). In terms of magnitude of losses, feed, farm supplies and grain were largest. The poor performance of the feed department was frequently a surprise to managers because it typically carried a better margin than most other departments. The co-ops that had two-thirds of their departments losing money suffered overall losses while the coops that had overall net profits had two thirds of their departments making money.

Generally, more focus of co-ops needs to be on low expense ratios than on high margins. While high margins may provide quite adequate earnings--provided business is not driven to the competition--farmer owners will bear the brunt of those margins. While there are trade-offs of service and expenses, farmers are probably best served currently by cooperatives with low margins and even lower expense ratios.

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Introduction

Missouri has approximately 100 locally owned farmer cooperatives providing farm supplies and/or grain marketing. Many of these establishments are located in close proximity to each other and to other competing firms. Some of the co-ops are financially sound while others are struggling to avoid additional losses in member equity or facing the possibility of having to cease operations because of losses incurred during the past few years.

The primary objective of this research has been to evaluate factors affecting financial performance of local cooperatives. Initial contacts with several managers indicated that those parts of the business where financial problems existed were not known with certainty. Moreover, in those departments where problems were suspected, analysis had not been done to determine the extent of the problem or the volume of losses that were occurring.

Methodology

The study is based upon financial data from 12 locally owned cooperatives in 3 separate areas of Missouri for fiscal year 1985. The 3 areas were selected because each has a unique type of production agriculture and each also has several co-ops and IOFs (investor owned firms) located in close proximity. Those firms included in this study were selected on the basis of their geographic location, not on predetermined sales volume or balance sheet characteristics.

Area one is located north of Springfield and includes Dallas and Polk counties. It is primarily a dairy and beef production region with little grain production (figure 1). Area two is northwest of the St. Louis metropolitan area and includes Lincoln, Montgomery, and Warren counties. Almost 40 percent of the total value of farm production comes from hogs. Other livestock, dairy, and poultry comprise another 19 percent with the remaining 41 percent comprised by crops. Virtually all grain not fed to livestock is marketed to central processing or export facilities located along the Missouri and Mississippi Rivers. The last area of study is comprised of Benton, Henry, Johnson, and Pettis counties and is located south of I-70 about midway between Kansas City and Columbia. About two-thirds of the value of agricultural production for the combined counties comes from livestock, dairy, and poultry production with the remainder coming from crop production.

Financial data from 12 locally owned farmer cooperatives were evaluated for FY-85 to determine which departments in each co-op had net earnings and which were incurring losses. Departments in the analysis included dry fertilizer, anhydrous ammonia, chemicals, feed, seed, grain handling and storage, farm supply, and petroleum. Each of the 12 co-ops provided most, but not all of these services. Differences in departmental profit and loss status for co-ops among the 3 study areas were difficult to identify because of the limited number of observations.

Some departmental data such as sales volume and cost of goods sold were obtained directly from financial records of the 12 locally owned cooperatives. However, allocating most of the cost and other income data required significant input from local managers and their staff. (Allocating costs based on formulas would have been desirable; however, departmentalized cost relationships among the 12 locals varied so much that attempts to develop formulas that were accurate predictors of cost allocation were unsuccessful). After the initial allocation was completed,

several refinements by managers and their staff were necessary to assure the most accurate departmental detail possible. All costs, including administrative, were allocated among the various departments. Specific details on the allocation procedure are included in appendix A.

The analysis is based on FY-85 data. While some caution should be exercised in drawing conclusions based on financial performance for only one year, it is nevertheless a valuable tool to use as a first approximation in identifying problem areas in a co-op. Changes in bad debt expense, level of sales due to weather or farm commodity programs, as well as structural changes could all result in quite different financial results of the same co-ops in the future.

The first portion of the analysis is based on the financial strength of the balance sheet and the overall net savings or loss status during FY-85. For those co-ops with a net savings, some departments were profitable while others lost money. The same was true for those co-ops showing a net loss in FY-85. Departments were then grouped by net savings or loss without regard to overall co-op profit or loss status to determine common characteristics associated with each. The relationship between departmental net savings, sales, gross savings, and bad debt expense was examined using ordinary least squares.

Co-op Net Savings and Loss Status

Most of the following analysis is based on income statement data. However, strength of the balance sheet can also be an important component in determining net savings or loss status. Therefore, a brief description of balance sheet information follows.

The Balance Sheet

The combined assets of the 12 firms were $17.4 million at the end of FY-85 with a range from approximately $306 thousand to approximately $3.1 million. The average value of assets for the savings firms was $1.8 million while for the loss firms was $995 thousand (table 1).

The combined member equity for the 12 firms was $12.2 million in FY-85 (table 1). The range was from $290 thousand to almost $2 million with an average of $1.016 million. The return on assets was 2.66 percent and the return on equity was 3.80 percent for all 12 firms.

A large difference exists in the combined balance sheets between those co-ops with positive net savings and those posting losses. The average member equity in the 7 firms with positive net savings was $1.324 million while those with net losses averaged only $586 thousand, or less than half as large as the net savings firms.

The average net savings (earnings) for the 7 firms was almost $106 thousand while the average net loss for the remaining 5 was slightly over $56 thousand.

The return on member equity was also significantly different based on co-op net savings or loss status. Those firms with positive net savings in FY-85 had a return to members equity of 8.02 percent while those with losses posted an average net loss of 9.57 percent.

The firms with losses had slightly higher interest expenses but this differential was not an important component of their losses. For example, if the firms with losses had had interest expenses at exactly the same percentage of sales as the net savings co-ops, their combined losses would have been reduced by only

$24,000 and their return on equity would have been -8.7 percent rather than -9.57 percent.

The profitable co-ops on average were larger, less highly leveraged, and had lower interest payments (as percent of sales) than those firms with losses. While those factors are ordinarily associated positively with profits, they are not ordinarily sufficient to explain large differences in earnings. Most of the explanation will be found in the departmental performances.

The Income Statement

The 12 local co-ops had gross sales of almost $41 million in FY-85 (table 2). Seven of the 12 co-ops had an overall net savings while 5 had losses for the year. However, the departmental savings or loss status within each co-op varied widely. About 2/3 of the sales were accounted for by the 7 profitable co-ops with average gross sales of $3.9 million. Co-ops losing money averaged gross sales of $2.7 million or an average of about $1.2 million less than those with net savings in FY-85.

The cooperatives with net savings had more departments that were profitable than did the cooperatives suffering overall net losses. For the 7 co-ops with overall net savings, 60 percent of all their departments were profitable while the remaining 40 percent lost money (table 3). However, for the 5 co-ops with overall net losses, almost two-thirds of the departments lost money while only about one-third made a profit.

Departmental sales volume and net savings (losses) were grouped by the overall savings or loss status of each co-op (table 4). The 7 profitable co-ops had net losses in anhydrous ammonia and farm supplies while the 5 loss co-ops had losses in 4 departments; chemicals, feed, grain, and farm supply. Note that the combined net profits for all co-ops were negative for anhydrous ammonia, feed, and farm supplies.

Major factors affecting the savings or loss status of any firm, including cooperatives, are: gross margins, total operating expenses, bad debt expenses, and other income. Each of these are related to total gross sales and expressed as percentages for all 12 co-ops, for the 7 profitable co-ops, and for the 5 co-ops with overall net losses (tables 5 & 6). The gross margin for profitable co-ops was 14 percent, while that for loss co-ops was only 10 percent. Existing data does not allow identification of which portion of the additional 4 percent gross margin resulted from more efficient, lower cost purchases and which should be attributed to higher sales prices.

The department with the largest difference in gross margin between net savings and loss co-ops was dry fertilizer (table 5). The gross margin for savings co-ops was 22 percent with net savings of 6 percent. Loss co-ops had gross and net savings of 11 and 1 percent, respectively. Actual differences between the two were less than first appearances since most of the net savings co-ops main-tained their own fertilizer inventory and equipment for spreading. Thus, a portion of the gross margin was actually a service fee for delivery and/or application services. The losing co-ops generally did not main-tain their own equipment and inven-tory, but instead merely handled customer accounts of a regional cooperative that actually owned all the equipment, facilities, and inventory. Locals generally received a flat 6 percent of gross sales for handling those accounts. Minimal cost to the local was involved, except in some instances when bad debts on fertilizer accounts became excessive. Therefore, even though the losing co-ops margin was

only half that of the profit co-ops, they were able to maintain positive net departmental earnings because of minimal operating expenses.

The net earning co-ops had gross margins that were less than the losing co-ops for anhydrous ammonia and grain. Three of 4 had losses in anhydrous ammonia and 2 of 5 had losses in grain (table 2). Most co-op managers agreed that anhydrous ammonia typically lost money, except in unusually good years when the weather accommodated both springtime application and early summer sidedressing on a large percent of the crop. In recent years the weather has not been favorable for large sales during both periods. Those two co-ops having net earnings in the anhydrous department generally had low depreciation and repair expenses while those four with losses had high operating costs.

Grain (handling and storage) varied widely among the various 9 co-ops. Those co-ops having overall net operating losses all lost money in grain (table 3). Although their gross margins were larger than those of the profit co-ops, higher total operating expenses more than offset the increased income. Three of the 5 profitable co-ops made money in grain. However, in each instance, much of the profit was comprised of storage income. When storage income was minimal, grain was a losing department, regardless of whether the co-op was in a profit or loss status.

Departmental analysis of feed between the profit and loss co-ops was particularly interesting. Although gross margins for the two were similar (15 & 14 percent for net savings and loss co-ops, respectively), total operating costs were significantly different. Operating costs for net savings co-ops were 16 percent of gross sales and included minimal bad debt expense (table 6). Total expenses for losing co-ops were 26 percent of gross sales, which was 10 percentage points higher than that of the profit co-ops. More than one-third of the total operating expenses were comprised of bad debts since several co-ops took large writeoffs of bad debts in 1985. A significant portion of the total bad debt expense for all the co-ops resulted from the feed department.

Farm supply was a losing department for all except 3 co-ops (table 3). Most managers indicated that competition from privately owned discount firms tended to set the price ceiling for supplies. The margin that co-ops could charge and still be price competitive with discount firms was not adequate to cover inventory carrying charges and salary expense for handling and selling supplies. Also, the unit cost of purchasing supplies for resale to farmers was greater to the co-ops than to the discount firms who bought larger volumes. Thus, the departmental loss status in most instances.

Two of the 3 co-ops with profitable supply departments resulted primarily because chemicals were included with farm supplies. If chemicals had been categorized separately, farm supply would have been a losing department for both co-ops.

Petroleum was sold by 6 co-ops in FY-85. For two net savings co-ops and one loss co-op, petroleum contributed a significant portion of their overall sales; all 3 had sizeable departmental profits (table 4). The remaining 3 co-ops sold only small quantities, primarily for customer convenience. All 3 posted departmental losses.

Note in table 5 that in 6 of the 8 departments a higher ratio of gross profits to sales was associated with a higher ratio of net profit to sales (when co-ops are identified by savings or loss categories). The major exception was grain; its peculiar

profit situation was explained above. Note also in tables 3, 4, and 5 that co-ops with net overall losses took losses, on average, in feed and grain (both usually large amounts), as well as chemicals and farm supply, while those co-ops with overall net savings took losses, on average, only in farm supplies and anhydrous ammonia.

Departmental Profit and Loss Status

Disaggregating income statement data for each of the 12 co-ops by department allowed a thorough analysis of those areas in which co-ops had net savings and those posting losses. The number of co-ops handling each type of department is listed in table 7. All 12 sold feed, seed, fertilizer, and farm supplies.

Combined analysis indicated that 5 of 8 departments had net savings in FY-85. Departments in which overall losses occurred accounted for almost $15 million of the $40 million, or 35 percent of total sales.

There is striking variation in the frequency among departments with which losses were incurred. At one extreme 6 of 9 (67%) of the grain handling departments incurred losses, while at the other extreme only 2 out of 12 (17%) of the dry fertilizer departments had losses. There were two other departments, besides grain, with greater than 50% of the co-ops having losses; these were farm supply and anhydrous (table 7). However, feed has to be highlighted as one of the most important troublesome departments, because its combined gross losses at nearly $200,000 ranked highest of all departmental losses. And, as the leading department in sales volume, the importance of net earnings in feed is obvious. For one co-op the feed department was its largest savings producer while for two co-ops it was the largest loser. The co-op with the largest savings in the feed department is located in an area with little competition while those with large losses have stiff competition from both co-op and IOF firms. Combined losses for feed of $198,527 in six co-ops more than offset the $173,570 net savings in the other six. Bad debt expense was obviously important (table 9) in the six losers.

The feed departments of the two co-ops in southwest Missouri both performed much better than their counterparts in the other two study areas. Dairy is the predominant livestock using feed in that area and co-op feedmills and feed delivery trucks tended to operate at nearer full capacity than in the other areas. Thus, the unit costs of operation were less which resulted in a higher profit in the feed department.

Dry fertilizer and petroleum were the leading money making departments in 1985 for these co-ops. Ten of 12 fertilizer and 3 of 6 petroleum departments were profitable. Moreover, average savings greatly exceeded average losses so that combined savings (after deducting losses) were about $560,000. Both departments had low bad debt expenses (table 9).

On the other hand, farm supply was clearly a problem department. The combined department losses (after deducting profits) were substantial ($161 thousand). Nine of 12 co-ops had losses in this department; 6 of 12 had their greatest dollar loss in this department. Most managers readily admitted that the farm supply department is almost always a net loser but is retained for convenience of their members.

Anhydrous ammonia had operating expenses equal to 30 percent of gross sales while the gross margin was only 19 percent. The high operating costs relative to sales resulted from low sales volume.

Impact of Bad Debt Expense on Net Profit

Bad debt expense for the 12 co-ops during FY-85 amounted to almost $441 thousand, which was about 1.1 percent of total sales. One co-op, with 55 percent of the group's total bad debt, wrote off 4.3 percent of its sales in FY-85 as bad debt. Thus, bad debt was a reasonable proportion of sales for the other 11 co-ops.

In an effort to determine how detrimental bad debt expense was to the overall financial performance of the 12 co-ops, net savings were revised upward by the amount of the bad debt. This was done on a departmental basis for each of the 12 co-ops. After the adjustment, 11 of the 12 co-ops would have had a positive net savings. Only one would have had a net loss for the year.

Although the overall co-op net profit situation would have been much better, the breakdown of departmental profit and loss (such as that shown in table 3) would have changed little. The profit and loss situation would not have changed for 5 of the 8 departments. In two of the remaining departments (chemicals and seed), one co-op in each would have moved from the loss to the profit category. In the feed department, two co-ops would have moved from the loss to profit category.

Therefore, even without any of the $441 thousand in bad debt expense, significant financial problems still would have existed in several departments of most of the co-ops. This fact indicates that careful analysis should be done by managers and their board of directors to determine the extent to which some departments are being subsidized by others and evaluate whether changes in policies are necessary.

Estimating Net Profit

Ordinary least squares was used to estimate the impact on net profit resulting from changes in the level of sales. The general hypothesis was that net profit increased as both sales and gross profit levels escalated. Bad debt expense was a significant expense for several co-ops in 1985 and was also tested for significance. Estimated coefficients (and associated t-statistics) for the departmental analysis appear in table 10.

Departmental Estimates

Although the coefficients are not statistically significant for all departments, results indicate a positive relationship between net profit and sales for all departments. So, as sales increased, net profit also increased. Also, the constant coefficients are negative for each department, indicating that a net loss would result with a low sales level for each department.

Empirical results for feed indicate a net profit of 4 cents per dollar increase in feed sales. While this initially seems to contradict reality (an overall net departmental loss), allowance for bad debt expense in the equation effectively reduces operating expenses such that a net profit is possible. Eleven observations and 3 parameters results in 8 degrees of freedom, indicating departmental sales volume is significant (5 percent level), but the constant and bad debt expense were not. With an R^2 of .76 considerable variation in net savings is explained, especially for cross sectional data. Most of the remaining variation should be attributed to management, competition, and other factors that are difficult to quantify.

A strong positive relationship exists between net savings and level of sales for fertilizer. Results indicate savings of about 11 cents for every dollar increase in sales, which is consistent with previous discussion. Again, bad debt expense was an important variable in explaining the level of net savings. The coefficient of 4.52 for debt is unrealistically high. Thus, it must include influence from another source, which could not be identified. The t-ratio was significant for both sales volume and bad debt expense.

Net savings were not related to departmental sales for the farm supply, grain and chemical departments. As indicated previously, farm supplies for co-ops tend to be associated with problems. In some instances, farm supplies may be considered "loss leaders" to induce purchases of other, more profitable, inputs or may merely be a customary service that is becoming more expensive to provide. Fewer firms handled grain and sold chemicals, therefore, empirical results should be treated cautiously because of few degrees of freedom.

The degree of competition in chemical markets varied widely among the co-ops according to statements by each of the managers. In some markets gross margins were adequate for normal savings while in others, chemicals were sold for a small gross margin to enhance fertilizer sales.

Estimates for All Farm Supplies

Net savings for all departments (excluding grain) were regressed against gross savings, gross margins, and bad debts to obtain the estimated impact of changes in each of these variables. Grain was excluded since it usually has a much narrower margin and no bad debt expense, and thus, is significantly different from most farm supply activities. The 12 co-ops had 68 individual departmental observations.

Gross sales and gross margins each provided about the same amount of explanation of the variation in net savings. Explained variation for total sales and bad debt was 0.59, or almost three-fifths of the total variation (table 11). While the results were not quite as good as some of the departmental estimators, the total supply estimator should prove more useful to individual co-ops. As with the departmental estimators, the constant terms were always negative, which indicates losses associated with low sales levels. For each dollar of gross sales made by a co-ops, net savings would be about 4.8 or almost 5 cents. Also, for each dollar of bad debt expense encountered by a co-op, net savings would decrease by 68 cents. With 68 observations, there were 65 degrees of freedom for each equation being estimated (table 11).

An alternative method to that just described was to regress net savings on gross savings and bad debt expense for all co-op input departments. Again 59 percent of the variation was explained (table 11). For each dollar increase in gross margin for any of the supply departments, a co-op could expect the net margin to increase by about 31 cents while each dollar of bad debt expense would result in a 68 cent loss for the net margin. The "t" test indicated that all coefficients for both equations were significant at the 1 percent level.

This estimation procedure shows the importance of a high level of gross sales in achieving positive net income. Likewise, it indicates the devastating impact of bad debt expense on net savings.

Table 1 -- Balance sheet data for 12 locally owned farmer cooperatives in Missouri, FY-85

Firm description	Total assets	Member equity	Net savings	-- Return on -- assets	equity
	------ thousand dollars -----			--- Percent ---	
Net savings firms (7)					
Totals	12,453	9,267	743	5.97	8.02
Maximum	3,137	1,969	204		
Minimum	1,116	726	37		
Average	1,779	1,324	106		
Loss firms (5)					
Totals	4,973	2,930	(280)	(5.64)	(9.57)
Maximum	2,338	1,062	(13)		
Minimum	306	290	(200)		
Average	995	586	(56)		
Total firms (12)					
Totals	17,426	12,197	463	2.66	3.80
Maximum	3,137	1,969	204		
Minimum	306	290	(200)		
Average	1,452	1,016	39		

Table 2 -- Sales and net savings or loss status for 12 selected locally owned farmer cooperatives in Missouri, FY-1985

Net Savings Status FY -85	Gross Sales	Gross Savings	Net Savings (Losses)
	- - - - - - Thousand dollars - - - - - -		
7 Net savings firms			
Totals	27,225	3,805	743
Maximum	6,537	959	204
Minimum	1,542	243	37
Average	3,889	544	106
5 Loss firms			
Totals	13,653	1,395	(280)
Maximum	5,691	558	(13)
Minimum	1,208	120	(200)
Average	2,731	279	(56)
12 Total firms			
Totals	40,877	5,201	463
Maximum	6,537	959	204
Minimum	1,208	120	(200)
Average	3,406	433	39

Table 3 -- Departmental net savings and loss categories distinguished by locally owned farmer cooperative overall savings or loss status, Missouri, FY-85

Department	Co-ops with overall Net Savings		Co-ops with overall Net loss	
	Departmental Savings	Loss	Departmental Savings	Loss
Dry Fertilizer	7	0	3	2
Anhydrous Ammonia	1	3	1	1
Chemicals	3	2	1	2
Feed	4	3	2	3
Seed	5	2	2	3
Grain	3	2	0	4
Farm Supply	2	5	1	4
Petroleum	2	1	1	2
Totals	27	18	11	21
Percent of total departments	60%	40%	34%	66%

Table 4 -- Financial data for 12 locally owned farmer cooperatives categorized by overall net savings or loss status, Missouri, FY-85

Department	Number of co-ops offering service: Dept Savings	Dept Loss	Total	Sales Volume: 7 Co-op Savings	5 Co-op Loss	12 Co-op Total	Net Savings (Loss): 7 Co-op Savings	5 Co-op Loss	12 Co-op Total
				Dollars					
Dry fertilizer	7	5	12	4,560,596	2,125,327	6,685,923	287,530	27,266	314,796
Anhydrous ammonia	4	2	6	540,093	149,453	689,546	-55,620	3,371	-52,249
Chemicals	5	3	8	1,568,833	730,133	2,298,966	106,589	-35,630	70,959
Feed	7	5	12	8,587,259	2,536,850	11,124,109	113,858	-138,815	-24,957
Seed	7	5	12	721,519	577,711	1,299,230	11,910	15,040	26,950
Grain	5	4	9	5,237,349	5,199,275	10,436,624	142,632	-122,933	19,699
Farm supply	7	4	12	1,683,989	830,553	2,514,542	-144,067	-46,924	-160,991
Petroleum	3	3	6	4,251,180	1,181,233	5,432,413	232,740	13,322	246,062
Totals*	-	-	-	27,150,818	13,330,535	40,481,353	695,572	-285,303	410,269

* Excludes data for liquid fertilizer, application services, and grocery departments that were included in tables 1 and 2.

Table 5 -- Savings and loss as a percent of sales for 12 locally owned farmer cooperatives, Missouri, FY-85

Department	12 cooperatives		7 Cooperatives with overall net savings		5 Cooperatives with overall net losses	
	Gross savings / Sales	Net savings / Sales	Gross savings / Sales	Net savings / Sales	Gross savings / Sales	Net savings / Sales
	Percent					
Dry Fertilizer	18	5	22	6	11	1
Anhydrous Ammonia	19	-8	18	-10	22	2
Chemicals	10	3	11	7	8	-5
Feed	15	0	15	1	14	-5
Seed	13	2	13	2	13	3
Grain	6	0	5	3	7	-2
Farm supply	13	-6	14	-7	11	-6
Petroleum	13	5	13	5	12	1
Totals	13	1	14	3	10	-2

Table 6 -- Various expenses and other income as a percent of sales for 12 locally owned farmer cooperatives, Missouri, FY-85

Department	Total Expense/Sales			Salary expense/Sales			Bad debt/Sales			Other income/Sales		
	All Co-ops	Savings Co-ops	Loss Co-ops	All Co-ops	Savings Co-ops	Loss Co-ops	All Co-ops	Savings Co-ops	Loss Co-ops	All Co-ops	Savings Co-ops	Loss Co-ops
Dry fertilizer	15	18	9	8	9	5	0	0	0	2	3	0
Anhydrous Ammonia (6 co-ops only)	30	33	20	13	16	5	0	0	1	3	4	0
Chemicals (8 co-ops only)	9	8	12	4	5	4	1	0	3	3	4	0
Feed	18	16	26	8	7	8	3	1	9	3	2	6
Seed	13	13	13	8	9	7	1	1	1	2	2	2
Grain (9 co-ops only)	8	7	9	4	3	4	0	0	0	2	3	0
Farm supply	20	21	17	12	13	8	1	1	2	0	0	1
Petroleum (6 co-ops only)	11	11	11	4	5	3	1	0	1	3	3	0
Totals	14	14	14	6	7	5	1	0	2	2	3	2

Table 7 -- Departmental saving and loss data for 12 selected cooperatives, Missouri, FY-85

Department	Number of co-ops offering service: Savings	Loss	Total	Sales Volume: Savings departments	Loss departments	Total	Net Savings (Loss): Savings departments	Loss departments	Total
				Dollars					
Dry fertilizer	10	2	12	5,459,036	1,226,887	6,685,923	323,257	-8,461	314,796
Anhydrous ammonia	2	4	6	170,701	518,845	689,546	6,195	-58,444	-52,249
Chemicals	4	4	8	1,429,994	868,972	2,298,966	126,668	-55,709	70,959
Feed	6	6	12	7,142,146	3,981,963	11,124,109	173,570	-198,527	-24,957
Seed	7	5	12	823,528	475,702	1,299,230	32,207	-5,257	26,950
Grain	3	6	9	4,462,054	5,974,570	10,436,624	159,598	-139,899	19,699
Farm supply	3	9	12	1,207,293	1,307,249	2,514,542	32,601	-193,592	-160,991
Petroleum	3	3	6	5,289,513	142,900	5,432,413	258,948	-12,886	246,062
Totals*	-	-	-	25,984,265	14,497,088	40,481,353	1,061,534	-682,437	379,097

* Excludes data for liquid fertilizer, application services, and grocery departments that were included in tables 1 and 2.

Table 8 -- Gross and net savings as a percent of sales for 12 locally owned farmer cooperatives categorized by departmental savings or loss, Missouri, FY-85

Department	12 cooperatives		Co-ops with division savings		Co-ops with division losses	
	Gross savings / Sales	Net savings / Sales	Gross savings / Sales	Net savings / Sales	Gross savings / Sales	Net loss / Sales
	Percent					
Dry Fertilizer	18	5	19	6	13	-1
Anhydrous Ammonia	19	-8	20	4	19	-11
Chemicals	10	3	12	9	6	-6
Feed	15	0	15	2	15	-5
Seed	13	2	15	4	11	-1
Grain	6	0	6	4	6	-2
Farm supply	13	-6	17	3	9	-15
Petroleum	13	5	13	5	1	-9
Totals	13	1	14	3	10	-2

Table 9 -- Various expenses and other income as a percent of sales for 12 locally owned farmer cooperatives categorized by departmental saving or loss, Missouri, FY-85

Department	Total Expense/Sales			Salary expense/Sales			Bad debt/Sales			Other income/Sales		
	All	Savings	Loss	All	Savings	Loss	All	Savings	Loss	All	Savings	Loss
Dry fertilizer	15	16	14	8	8	7	0	0	0	2	3	0
Anhydrous Ammonia	30	17	35	13	8	15	0	1	0	3	0	5
Chemicals	9	8	12	4	4	5	1	0	3	3	4	0
Feed	18	14	26	8	6	11	3	1	6	3	1	6
Seed	13	13	14	8	9	7	1	1	1	2	2	2
Grain	8	7	9	4	3	4	0	0	0	2	4	0
Farm supply	20	15	24	12	8	15	1	1	1	0	1	0
Petroleum	11	11	10	4	4	6	1	1	0	3	3	0
Totals	14	14	14	6	7	6	1	1	2	2	3	2

Table 10 -- Estimated coefficients for explaining departmental net savings based on departmental sales volume and bad debt expense, Missouri, FY-1985

Department	Constant	Sales volume	Bad debt expense	R^2
Feed	-19.98 (-0.92)	0.04 (4.70)	-0.87 (-1.48)	.76
Fertilizer	-18.39 (-1.03)	0.11 (5.29)	-4.52 (-2.48)	.79
Farm supply	-30.81 (-1.31)	0.08 (1.56)		.21
Grain	-15.36 (-0.50)	0.03 (1.86)		.37
Chemicals	-22.10 (-0.68)	0.12 (1.49)		.31

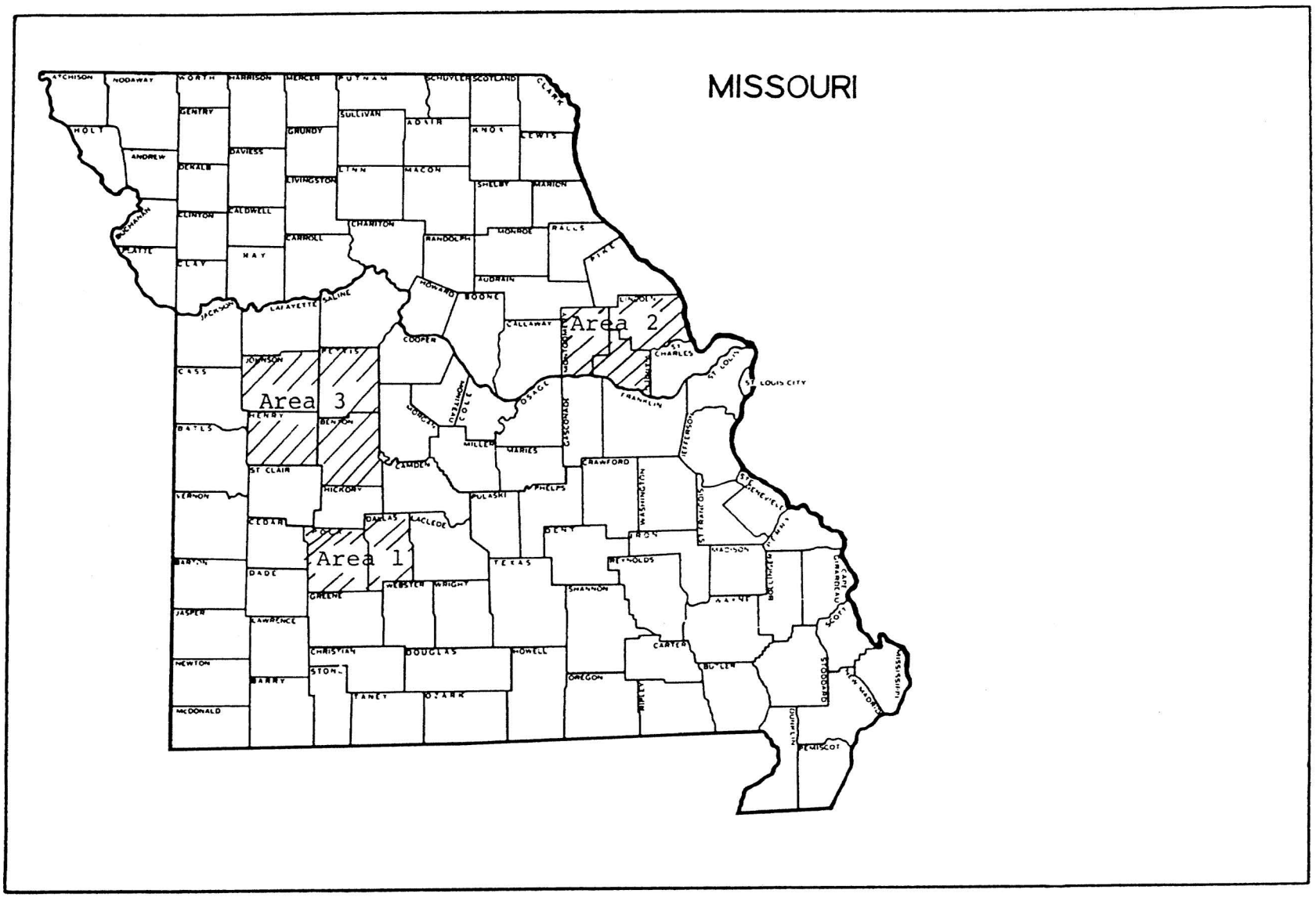
Note: "t" statistics are included in parenthesis.

Tables 11 -- Estimated coefficients for explaining changes in net profit (savings) resulting from changes in gross sales, gross margins, and bad debt expense for 12 locally owned farmer cooperatives in Missouri, 1985

Constant	Sales volume	Gross margin	Bad debt expense	R^2
-11.012	0.048 (9.13)		-0.678 (-5.48)	0.59
-10.469		0.310 (9.13)	-0.678 (5.41)	0.59

Note: "t" statistics are included in parenthesis.

Figure 1. -- Study areas for a farm supply purchasing survey in Missouri, 1985.



Appendix A

Most of the basic financial information presented in this report was contained in audit reports of the various locally owned farmer cooperatives. When this information was inadequate for departmental detail, various other co-op records and information were used. Finally, when no recorded information was available, the manager and his staff allocated administrative and other costs, other income, and other sources of income and expenses. Particular care was taken to allocate costs correctly for those departments where seasonality was important. All costs were allocated among the departments.

Audit reports contained departmental information on sales, beginning and ending inventories, and purchases. The only revenue adjustments necessary for these data were discounts offered by some co-ops. The departments in which they occurred were identified by management and discounts were deducted from gross sales of the respective departments.

Other Income

Most other income was readily identifiable. Grinding, mixing, and most trucking were attributed to feed. Storage, some trucking, drying, and brokerage commissions were included with the grain department. Most equipment rental income involved fertilizer equipment and was included with that department.

Income which was considered administrative included patronage refunds from other co-ops, interest, dividends, cash variance, commission on state taxes, collection of member debts which had been written off to offset bad debts to the co-op. This miscellaneous income essentially offset some of the administrative costs of operating the co-ops.

Income from finance charges was allocated to those departments in which sales were made on account. Most finance charge income was from feed; however, some was from fertilizer, chemicals, seed, and farm supplies. Managers and bookkeepers identified and allocated the finance charge income.

Expenses

Expenses were the most difficult to identify in the departmental allocation process. Labor (including retirement, insurance, FICA and other taxes) was allocated to each department based on where the employees worked. For seasonal employees working in various departments during the year, costs were allocated based on the time spent in each department. Personnel not directly associated with a particular department were charged to administration.

Depreciation expense was allocated among departments by identifying each asset on the depreciation schedule. For those assets with multiple uses, the manager (or his staff) allocated the expense among the appropriate departments. As with labor expense, depreciation on assets which could not be associated with a particular department was charged to administration.

Interest expense was allocated by averaging the beginning and ending inventory for each department and taking the average as a percent of total inventory. This was somewhat unreliable since most managers attempt to reduce inventories as much as possible prior to audits. Therefore, the numbers used probably do not accurately reflect actual inventories during much of the year.

Rent, lease, repairs, taxes, licenses, and delivery (trucking) were all relatively easy to allocate among departments. In most instances managers knew what each of the expenses were for, and when necessary, records were available to help allocate by department.

Insurance and utilities were more difficult to departmentalize. Most insurance (other than employee) was obtained in one or two blanket policies for all co-op activities. Therefore, it was necessary for each manager to divide insurance expense on somewhat of an arbitrary basis. Utilities were allocated almost entirely by each manager primarily based on how energy intensive items in each department were and the seasonality of each department. While no individual metering was done in any of the co-op locations, cross checking departmentalized utility expense among the 12 co-op locations helped to assure accuracy.

Bad debts were charged to those departments from which purchases were made and payment was not forthcoming. Most of the bad debt expense was for feed. After bad debts had been written off, some money was later collected. In those instances the "income" was treated as other income or as reduced member equity in the co-op.

All other expenses were considered administrative for most of the co-ops. These included accounting, data processing, legal and collection, audit, tax preparation, bank service charges, advertising, plant and office supplies, meetings, travel, directors, subscriptions, dues, contributions, business advisory service, trash and pest control, and income taxes. The single exception was advertising in which some co-ops promoted specific items such as feed, farm supplies, or other items. In those cases, advertising was charged to the appropriate departments.

Other Adjustments

This section allowed for sale or reevaluation of assets. These were also considered administrative, rather than being departmentalized. During FY-85 none of the 12 co-ops studied had significant sale or reevaluation of assets. However, in FY-86 and 87, the devaluation of Farmland and MFA, Inc. stock would result in substantial adjustments for local co-ops.

Administrative Expenses

Departmentalizing administrative expenses was the most difficult part of the analysis. It can be based on gross sales, on gross sales after adjusting some departments (such as grain sales) downward, an estimate by the manager of time spent on each activity, or some other arbitrary measure. Some researchers believe that administrative expenses cannot be accurately allocated and should be considered "a cost of doing business."

For this analysis, administration expenses were allocated based primarily on the percentage of total sales volume, with an adjustment for grain sales (for those co-ops with substantial sales). Most of the 12 managers were more comfortable with this type of allocation and believed it to be more accurate than any other method. The percentage reduction to be charged to grain handling depended on how much time and the number of manhours involved. For one co-op that did extensive handling of grain markets, the percentage figure was not altered. However, for most other co-ops, the figure was reduced by one-third to one-half of the initial value.