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Staff Papers Series

Staff Paper P89-37

September 1989

MERGERS, CONSOLIDATIONS, ACQUISITIONS: EFFECT ON PERFORMANCE OF AGRICULTURAL COOPERATIVES

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This research was supported by the Agricultural Cooperative Service of the United States Department of Agriculture.

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ABSTRACT

Reorganization has been promoted as a means to strengthen the position of cooperatives within the agricultural economy. The purpose of this study is to determine if agricultural cooperatives that reorganized through merger, acquisition, or consolidation have improved their financial performance. Although the research suggests reorganization may not be beneficial to the strongest cooperative in either the short or longer run, at least 33% of the observed reorganizations can be classified as unqualified successes. The data include 53 cooperatives involved in 24 reorganizations.

MERGERS, CONSOLIDATIONS, ACQUISITIONS: EFFECT ON PERFORMANCE OF AGRICULTURAL COOPERATIVES

Introduction

Reorganization of cooperatives has been promoted as a means to strengthen the position of cooperatives within the agricultural economy. The desire to eliminate duplicative services, enhance market power by consolidating competing cooperatives, and exploit economies of size are possible motives for reorganization. The purpose of this study is to determine if the agricultural cooperatives that engage in mergers, consolidations or acquisitions improve their financial performance after reorganization.

Previous research (Garoyan and Cramer; Haskell; Swanson) has indicated that financial performance does not always improve after reorganization. However, cooperatives continue to merge and consolidate. The contradiction between research and the continued enthusiasm for cooperative reorganization on the part of some members, managers, and advisors prompted the current inquiry.

After a brief review of previous research on reorganization performance, the research design and data of this investigation are presented. The financial performance of the cooperatives prior to reorganization is described, followed by an analysis of the effects of reorganization on the strongest cooperative. The next section analyzes the impact of cooperative reorganization on the members of the entire group of cooperatives participating in the reorganization. Concluding comments are presented in the final section.

*The authors wish to thank Jim Chalfant, Murray Fulton, Jim Houck, Zvi Lerman, Glenn Pederson, Lee Schrader, and Frank Smith for their constructive comments on earlier drafts; and the St. Paul regional office of the Farm Credit System for providing information and data.

Previous Research

Most research on the financial performance of reorganized cooperatives has not been encouraging. Garoyan and Cramer conducted a case study of ten reorganizations that were initiated by undercapitalized, weak cooperatives experiencing operational difficulty. All of the cooperatives were motivated to improve operating efficiency by achieving economies of size through reorganization. Immediately after reorganization most of the cooperatives reduced their average total costs, but two years after reorganization seven of the ten cooperatives were found to be less profitable than prior to reorganization. Haskell conducted a case study of four reorganizations involving a large, strong local cooperative merging with a small, weak cooperative. All four cooperatives were found to have reduced profitability three years after reorganization. Swanson also found that reorganized cooperatives experienced a decrease in profitability after reorganization regardless of the type of reorganization. Cooperatives participating in mergers, however, were found to increase their liquidity.

Studies indicate that cooperatives have experienced strong growth rates through reorganization. Mueller found that cooperatives growing by reorganization increased total assets and sales more rapidly than those growing internally. Garoyan and Cramer observed similar results. Chen found that large cooperatives relied on mergers and acquisitions for their growth to a greater extent than comparable investor-owned firms. Historically, however, cooperatives have tended to grow through internal rather than external expansion (Mueller; Cobia and Farris; Garoyan and Cramer).

The research results on reorganization of investor owned firms are largely similar. In a case study examining reorganizations of investor-owned corporations, Kitching concludes that improvements in efficiency and profitability were generally small. In retrospect almost one-third of the case study mergers (21 out of 69) were rated as failures by the executives involved in the reorganization.

In a review of previous research on mergers and profitability of investor-owned firms, Utton found little support for the hypothesis that mergers enhance firm performance. Only two out of thirteen studies using financial statement data indicated mergers led to improved performance, six found no difference, and five concluded performance declined.

Contrary to these findings, studies analyzing the benefits of reorganization of investor-owned firms through stock price behavior indicate that mergers and acquisitions improve efficiency (Council of Economic Advisors). A criticism of stock market analysis, however, is the assumption that "stock market reactions are necessarily correct in their predictions of merger consequences" (Ravenscraft and Scherer, p. 8). In any case, stock prices cannot be used to analyze the performance of cooperatives because there is no market for cooperative shares and cooperative reorganization cannot be motivated by under-valued stocks.

There are several shortcomings to the previous research on cooperative reorganizations. Previous authors attributed all changes in performance to reorganization, disregarding the effects of industry changes, macro-economic conditions, or government policies. Also the length of time observed after reorganization may have been too short to detect changes in performance. The current inquiry attempts to mitigate

these shortcomings by measuring the financial performance of reorganization participants relative to the average performance of a related population of cooperatives, and by supplementing the analysis of the short-run post-reorganization performance with an analysis of longer run performance. Unlike previous studies, the present research also attempts to analyze the overall effect of reorganization on members of all the reorganizing cooperatives.

Data and Research Design

The data consist of the annual operating statements and balance sheets of the 53 Minnesota local cooperatives that participated in 24 reorganizations between the years 1979 to 1984. A local cooperative typically serves the geographic area surrounding one community.

Reorganizations are conventionally classified into three categories: mergers, acquisitions, and consolidations. A merger occurs when two or more firms combine and only one of the firms maintains its identity; an acquisition occurs when the control of a firm's assets is purchased by another firm; a consolidation occurs when one or more firms combine to form one new firm. In mergers or acquisitions, one firm "survives" and retains its identity. In a consolidation no firm retains its original identity but one of the participants usually can be identified as the strongest by some measure. In this research, the 24 post-reorganization cooperatives were formed through ten mergers, six acquisitions, and eight consolidations.

This research uses two approaches to measuring the effect of reorganization on financial performance. The first approach, similar to the approach used by previous authors, analyzes the change in the pre and post-reorganization financial performance of the surviving or strongest participant. The second approach, which is novel to this study, examines the post-reorganization financial performance of the new cooperative to the pre-reorganization financial performance of all of the reorganization participants.

Another feature of this research is the analysis of the relative success of "horizontal" and "congeneric" reorganizations. A reorganization is referred to as "horizontal" if the participants are in the same line of business (i.e. a grain cooperative combining with other grain cooperatives). A reorganization is referred to as "congeneric" if the participants do not specialize in the same service (i.e. a grain cooperative combining with non-grain cooperatives). The analysis will attempt to determine if one of these two types of reorganization has a significant effect on financial performance.

Corporate performance is conventionally measured by financial ratios. In this research, annual ratios measuring liquidity, labor efficiency, leverage and profitability were calculated for each of the reorganizing cooperatives.

The *liquidity* ratio measures the degree to which the cooperative's current liabilities are covered by the liquid current assets. In this study liquidity is measured by the ratio of current assets less inventory to current liabilities. Known as the "acid test" or "quick" ratio, this liquidity ratio is a more conservative measure than the current ratio.

The *labor efficiency* ratio measures how the cooperative is utilizing its human resources. For this research, labor efficiency is measured by the salaries to sales ratio, the labor expense per dollar of sales. Salary expenditure includes both wage and salary employees.

The *leverage* ratio measures the proportion of assets financed by creditors. Here, leverage is measured by the ratio of total liabilities to local assets, where local assets are defined as total assets less investments in other cooperatives. The rationale for measuring leverage by a ratio based on local rather than total assets is due to the inability of a local cooperative to liquidate its investment in other cooperatives in order to repay its debt.

The *profitability* ratio measures the operating performance of the firm. In this study profitability is measured by the ratio of local net margin to sales. The local net margin is calculated by deducting from total income the cost of goods sold, operating expenses, and patronage refunds received from other cooperatives. Again local net margins are used in order to isolate the profitability of the local cooperative from the contribution of its relations with other cooperatives.

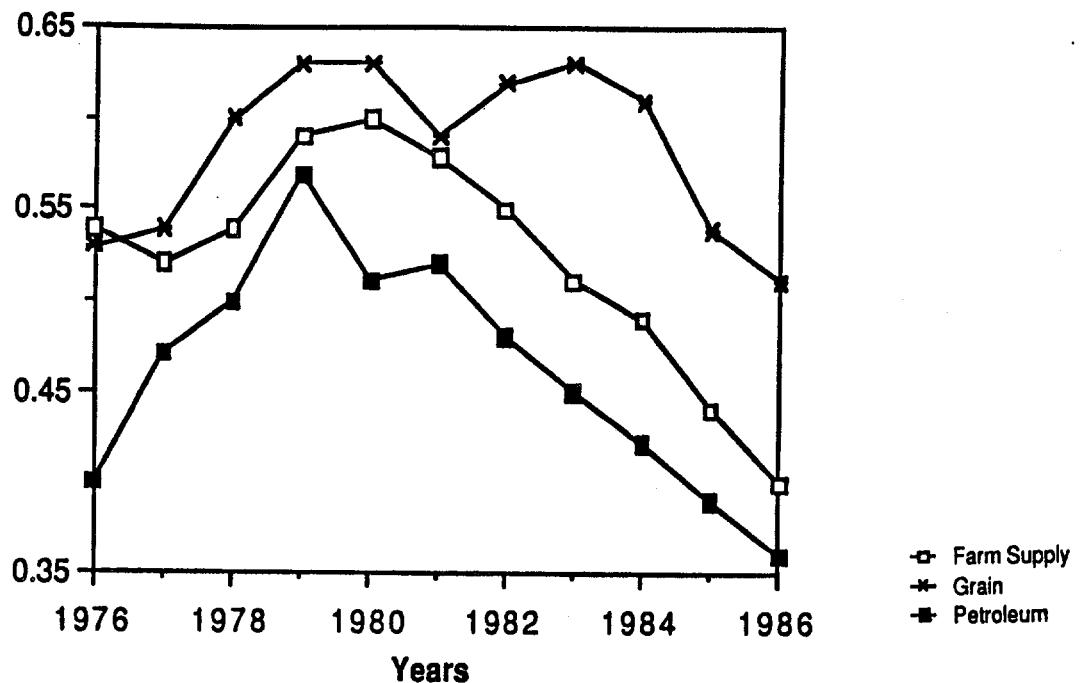
A return-on-assets profitability ratio was not included in the analysis for two reasons. The period of study included years of fairly high inflation, which introduced a significant downward bias in the historical book value of the fixed assets. Profitability is therefore measured in this study by a ratio of two current-value items, net margins and sales. In addition, information was not available for each cooperative as to how asset valuation was handled at the time of

reorganization. Assets may have been revalued to replacement value or continued to be carried at book value.

Financial ratios change over time even without reorganization. To illustrate the variability of financial ratios over time, Figure 1 presents the average leverage ratio of Minnesota farm supply, petroleum and grain cooperatives for the period 1976 to 1986.¹ The figure indicates that the 1970s were characterized by an increase in borrowing as cooperatives expanded their facilities and services in response to the strong agricultural economy. During the 1980s, the average cooperative experienced a decrease in borrowing as expansion activities were curtailed in response to the decline in the agricultural economy. Figure 1 underscores the importance of comparing the performance of an individual cooperative to a control group. For example, if the evaluation of a cooperative's leverage does not account for changes in the external environment, a decrease in the leverage of a reorganized cooperative in the 1980s would be entirely attributed to reorganization without rather than accounting for industry-wide responses to changes in the economy.

To adjust for factors affecting all cooperatives and to account for differences among types of cooperatives, each financial ratio of a reorganized cooperative is divided for each year by the average ratio of the population of similar Minnesota cooperatives borrowing from the St. Paul office of the Farm Credit System. For example, the 1980 profitability ratio for a reorganized grain cooperative is divided by the 1980 average profitability ratio for the population of Minnesota grain cooperatives. The division of each cooperative's ratio by the average ratio for a population of cooperatives of a similar type standardizes the

FIGURE 1. Average Total Liability/Local Assets Ratio of Minnesota Farm Supply, Grain, and Petroleum Cooperatives: 1976 to 1986



Data Source: St. Paul Farm Credit Services

data. The resulting standardized ratios indicate a cooperative's performance relative to cooperatives with similar product mixes.

The cooperative's financial performance before reorganization is determined by calculating a two-year standardized average of each ratio prior to reorganization in order to avoid a snapshot effect. To determine performance after reorganization, two post-reorganization averages are calculated -- short run and longer run. Short run performance is measured by the average of the second and third year's ratio after reorganization. At least one full year was allowed to elapse after reorganization before financial data were used to construct post-reorganization averages. The second year observation was between 12 and 23 months after reorganization, depending on the timing of the reorganization relative to the annual financial statement date. Longer run performance is measured by the average of the fifth and sixth year's ratio after reorganization whenever data are available.

Pre-Reorganization Performance

The relative performance of the cooperatives prior to reorganization is analyzed in order to test the following:

- are cooperatives entering reorganization significantly different than the average cooperative?
- does one type of reorganization involve significantly stronger or weaker participants?
- are there significant pre-reorganization differences between the survivors and the non-survivors?

Previous research on investor-owned firms suggests that acquired companies (the "non-survivors") are appreciably less profitable on average than their acquirers (the "survivors") or the control group (Ravenscraft and Scherer; Dewey; Manne).

Ordinary least squares regression is used to examine the relative financial characteristics of the 53 cooperatives that reorganized. Four regressions were run, one for each of the performance ratios. The dependent variable in the regression is the standardized two-year average of the ratio prior to reorganization. The explanatory variables are dummy variables for the type of reorganization, the type of cooperative, and whether or not the cooperative survives after reorganization.

The ratio of an average cooperative equals one due to standardization. In order to test for significant differences of the reorganization participants from the average cooperative, Table 1 presents the values of 1 minus the estimated ratio for each reorganization category. Ratios that are significantly different from 1 by the t-test are indicated by asterisks.

For non-surviving cooperatives (both acquired and merged), the estimated mean profitability ratio is significantly below average and negative indicating a net loss position prior to reorganization. An examination of the data indicates that all six acquired cooperatives and eight of the ten non-surviving merged cooperatives were in a net loss position prior to reorganization. In contrast, Ravenscraft and Scherer reported that only 5.8% of the 634 firms acquired by companies traded on the New York Stock Exchange had a negative operating income prior to

Table 1. Estimated Difference from Average for Reorganization Participants

<u>Reorganization Classification</u>	<u>Liquidity Ratio</u>	<u>Efficiency Ratio</u>	<u>Leverage Ratio</u>	<u>Profit Ratio</u>
<u>Non Survivors</u>				
Mergers				
grain	-.04***	-.01	.31***	-2.45***
farm supply	-.14	.17	.31**	-2.04**
petroleum	-.35	.14	.53**	-6.23***
Acquisitions				
grain	-.22	.31**	.63***	-3.77***
farm supply	-.33**	.49***	.62***	-3.36***
petroleum	-.54*	.47**	.85***	-7.55***
<u>Consolidations</u>				
grain	-.07	.08	.09	-1.41**
farm supply	-.17	.25**	.08	-1.00
<u>Survivors</u>				
Mergers				
grain	.32**	-.21**	-.19*	1.12
farm supply	.22	-.03	-.20	1.54
Acquisitions				
grain	.13	.12	.12	.19
farm supply	-.03	.30**	.11	.22

Note: For the efficiency and leverage ratios a positive value indicates below average performance.

There are no petroleum survivors in the data.

Difference from 1 tested using T-ratio:

*Statistically significant at the 10% level of confidence.

**Statistically significant at the 5% level of confidence.

***Statistically significant at the 1% level of confidence.

acquisition. These results suggest that, among cooperatives, mergers and acquisitions may have been used as an alternative to bankruptcy.

In addition to the below average profitability, the acquired cooperatives are estimated to be significantly more leveraged, less liquid, and less labor efficient than average prior to reorganization. The significantly below average performance for the acquired cooperatives may explain why these weak cooperatives are indeed acquired and are unable to bargain successfully for retaining a measure of ownership through a merger or consolidation.

For consolidators, none of estimated mean performance ratios are significantly above average prior to reorganization and in two categories their estimated ratios are significantly below average. On average the profitability ratio of the consolidating grain cooperatives and mean labor efficiency ratios of the consolidating farm supply cooperatives are estimated to be significantly below average.

For the last category, most surviving cooperatives also do not seem to be reorganizing from a position of relative strength. Only the surviving grain cooperatives that merge appear to be financially strong prior to reorganization. Their liquidity, labor efficiency, and leverage ratios are significantly above average. None of the surviving mergers or acquirers categories, however, have an estimated mean profitability ratio significantly above average prior to reorganization.

In summary, the pre-reorganization estimates indicate that on average:

- acquired cooperatives are performing below average in all four ratios;

- the non-surviving merged cooperatives are below average in profitability and leverage;
- most consolidation participants are average performers;
- most reorganization survivors are average performers;
- grain cooperatives dominating a merger are the financially strongest reorganization participants.

Post-Reorganization Performance: The Strongest Cooperative's Perspective

In order to detect the effect of reorganization, the pre and post-reorganization performance ratios of the strongest cooperative are compared. The comparison indicates if the reorganization improves, weakens, or leaves unchanged the strongest participant's measures of financial performance. For mergers and acquisitions the cooperative that has retained its identity is considered the strongest cooperative. In the case of consolidation, no one cooperative retains its identity and a decision has to be made as to which of the two or three participants in the consolidation should be treated as the strongest cooperative. Examination of all the observations in the data shows that higher profitability is the only financial ratio by which merger and acquisition survivors outperform the non-survivors in every observation. Thus, the consolidator with the highest pre-reorganization profitability among the participants is treated as the strongest cooperative in the analysis.

Ordinary least squares regression is used to estimate the effects of various forms of reorganization on the change in each relative performance ratio. The dependent variable is the difference in the two-year average standardized ratio before and after reorganization for the strongest cooperative. The explanatory variables are the type of reorganization,

the type of cooperative, the pre-reorganization ratio and a dummy variable indicating if the reorganization is a "horizontal" or "congeneric" reorganization. The value of the pre-reorganization ratio is included as an explanatory variable to determine if the initial relative strength of the cooperative affects the change in the ratio.

The regression equations are estimated using both the short run and longer run data. The estimated dummy variable coefficients are used to construct the estimated effects of the 12 reorganization categories on the change in each performance ratio of the strongest cooperative. The r-squares for the eight regressions range from .37 to .67 for the short run regressions and .71 to .88 for the long run regressions. An analysis of the short and longer run effects is reported in the next two subsections.

Short Run Performance

To measure changes in short run performance, the two-year average of each ratio for the second and third year after reorganization is compared to the two-year average of the strongest cooperative immediately prior to reorganization.

Table 2 reports the results of testing the hypothesis that the estimated effects of reorganization on the change in the ratio equal zero. In each of the 12 reorganization categories, reorganization is found to have a significant negative effect on at least one of the following performance ratios: leverage, efficiency, or profitability. Because reorganization usually involves an increase in long term financing, it is not surprising that most reorganizations have a significant negative effect on leverage. The significant negative effect on the efficient use

**Table 2. The Effect of Reorganization on the Change in Financial Ratios:
Short Run Case**

<u>Reorganization Classification</u>	<u>Liquidity Ratio</u>	<u>Efficiency Ratio</u>	<u>Leverage Ratio</u>	<u>Profit Ratio</u>
<u>Grain</u>				
Mergers				
congeneric	.83***	.59***	-.14	1.17
horizontal	.49	.45**	.06	.38
Acquisition				
congeneric	.35	.52**	.11	.97
horizontal	.02	.38*	.31**	.18
Consolidation				
congeneric	.54*	.47*	.11	.55
horizontal	.21	.33	.31**	-.24
<u>Farm Supply</u>				
Mergers				
congeneric	.77**	.48*	.21	-2.01
horizontal	.43	.34	.41***	-2.80*
Acquisition				
congeneric	.29	.41	.45***	-2.21
horizontal	-.04	.27	.65***	-3.00*
Consolidation				
congeneric	.48	.36	.45***	-2.63*
horizontal	.15	.22	.65***	-3.42***

Note: Positive values indicate a negative effect on efficiency and leverage.

Difference from 0 tested using T-ratio in a two tailed test.

*Statistically significant at the 10% level of confidence.

**Statistically significant at the 5% level of confidence.

***Statistically significant at the 1% level of confidence.

of personnel may reflect the difficulty that Boards of Directors and managers have in restructuring personnel and releasing redundant labor in small communities. With respect to profitability, more than 3 years may be necessary before reorganization can begin to have a positive effect.

Most reorganization categories involving farm supply cooperatives have a significant negative effect on profitability, whereas the reorganizations of grain cooperatives have no significant effect on profitability. The differential impact on profitability between grain and farm supply cooperatives may be related to reorganization motives. The grain cooperatives may have initiated a reorganization to capture the cost economies of size resulting from the structural changes in rail transportation during the period of analysis, whereas the farm supply cooperatives may have initiated a reorganization to maintain market share or been pressured to rescue a financially weak cooperative. Profitability should be easier to maintain when a reorganization is motivated by scale economies rather than undertaken as a defensive strategy.

Liquidity is the only performance ratio that is estimated to significantly improved in some of reorganization categories. These results are similar to Swanson's findings that mergers increase liquidity, but with the refinement that only congeneric mergers have a significant and positive effect on liquidity. This reorganization effect on liquidity may be due to diversification achieved through the reorganization of dissimilar cooperatives which have different seasonal cash flow requirements.

Pre-reorganization performance was found to have a significant positive effect on the short run change in the liquidity and efficiency

ratios after reorganization. The profitability and leverage ratios were not affected by the pre-reorganization performance in the short run.

Longer Run Performance

Longer run performance is measured by an average of the ratios for fifth and sixth year after reorganization, which is compared to the pre-organization ratio. Longer run data are only available for 14 of the 24 reorganizations -- six mergers, five consolidations, and three acquisitions. The lack of long-term data is the result of the recent occurrence of six of the reorganizations and not enough time has elapsed to have longer run data. In addition, four of reorganization observations were lost because the cooperatives subsequently dissolved or underwent further reorganization.

Table 3 reports the results of testing the hypothesis that the longer-run effects of the reorganization categories equal zero. The longer-run results indicate that on average:

- all reorganization categories have a negative effect on labor efficiency;
- most reorganization categories have a negative effect on leverage;
- most reorganization categories have a positive effect on liquidity;
- congeneric reorganizations of grain cooperatives have a positive effect on profitability;

Unlike the short run case, none of the reorganization categories have a significant negative effect on profitability, and the pre-reorganization performance ratio is found to have a significant positive effect on the change in all four performance ratios. These effects of the pre-

**Table 3. The Effect of Reorganization on the Change in Financial Ratios:
Longer Run Case**

<u>Reorganization Classification</u>	<u>Liquidity Ratio</u>	<u>Efficiency Ratio</u>	<u>Leverage Ratio</u>	<u>Profit Ratio</u>
<u>Grain</u>				
Mergers				
congeneric	.90***	1.29***	.39	1.76*
horizontal	1.06***	1.02***	.44*	.93
Acquisition				
congeneric	.65**	1.09***	.34	3.08**
horizontal	.81**	.82**	.39	2.26
Consolidation				
congeneric	.80***	1.26***	.37	2.02*
horizontal	.96***	.99**	.43*	1.20
<u>Farm Supply</u>				
Mergers				
congeneric	.42**	1.51***	.89***	.29
horizontal	.58**	1.23**	.95***	-.53
Acquisition				
congeneric	.17	1.30**	.85***	1.62
horizontal	.33	1.03**	.90***	.80
Consolidation				
congeneric	.32	1.48***	.88***	.56
horizontal	.48*	1.21**	.94***	-.27

Note: Positive values for a reorganization category indicates a negative effect on the efficiency and leverage ratios.

Difference from 0 tested using T-ratio in a two tailed test.

*Statistically significant at the 10% level of confidence.

**Statistically significant at the 5% level of confidence.

***Statistically significant at the 1% level of confidence.

reorganization ratios imply that the financial strength of the cooperative prior to reorganization affects the change in financial performance after reorganization.

Post-Reorganization Performance: Comparison to All Pre-reorganization Participants

Up to this point, the analysis has focused on the effects of the reorganization on the financial performance of the strongest participant involved in the reorganization. This approach ignores the effect of the reorganization on the other participants. Cooperative reorganization can also be evaluated by comparing a post-reorganization performance ratio to the pre-reorganization ratio of each participant. A reorganization can then be classified as an unqualified success if the post-reorganization performance ratio is stronger than the performance ratio of all of the reorganization participants prior to reorganization (stronger than the strongest pre-reorganization participant ratio). In this case, the reorganization can be considered Pareto optimal, as all participants are better off compared to their pre-reorganization performance. A reorganization is classified as a failure if the post-reorganization performance ratio is weaker than the weakest pre-reorganization ratio of any of the participants. A reorganization is classified as a "judgement call" if the post-reorganization performance ratio does not fall into either category. In this case, the strongest participant has not improved performance, yet the reorganized cooperative is stronger than the weakest participant prior to reorganization.

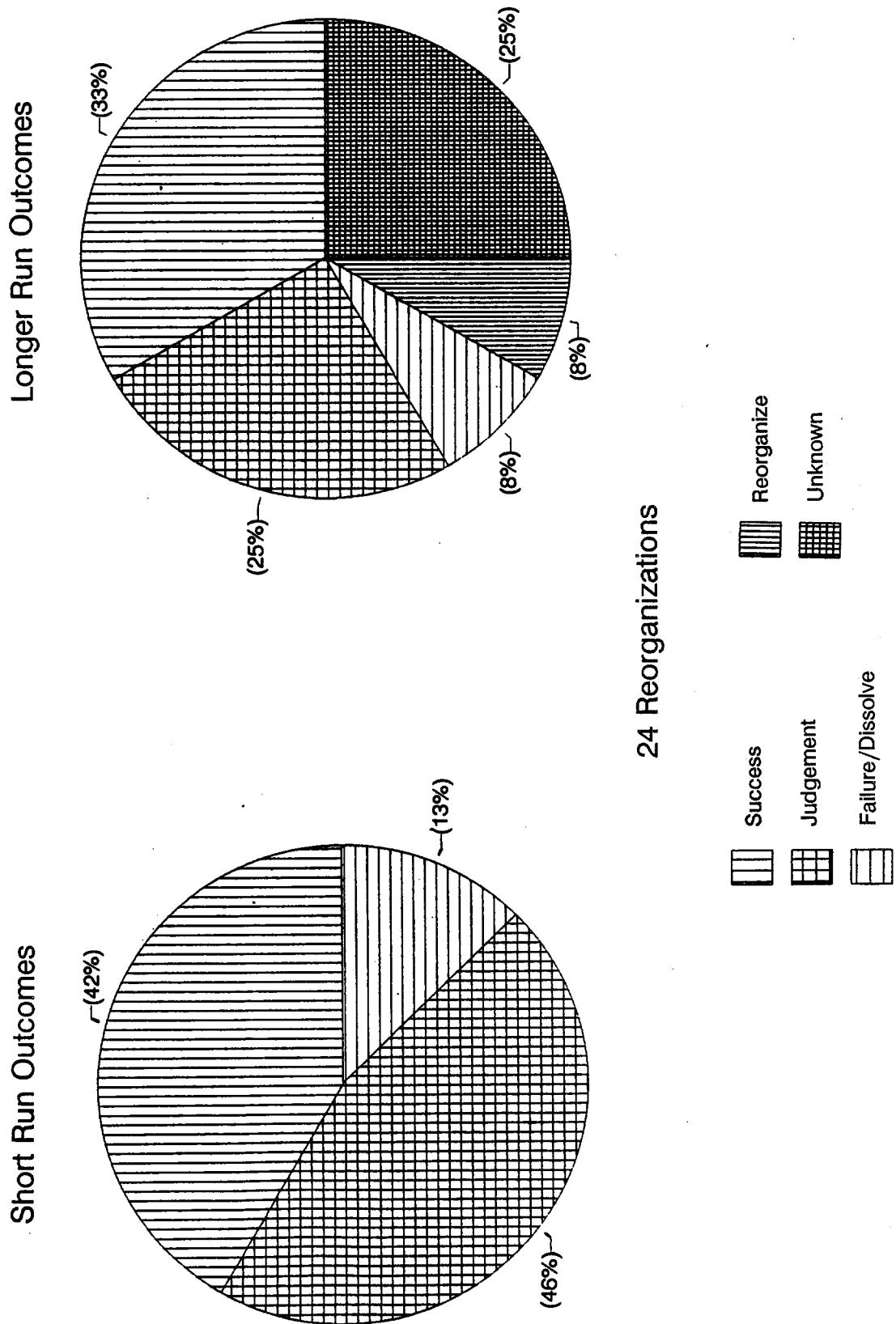
Figure 2 illustrates the distribution of the success, failure, and judgement call outcomes of the 24 reorganizations using the profitability performance ratio as the basis for comparison. In the short run three of the reorganizations are unqualified failures and the "judgement calls" outnumber the unqualified successes. In the longer run, the failure category consists of two cooperatives that dissolved after reorganization. The cooperatives that have undertaken further reorganization can not classified into one of the three previously defined categories and are classified as reorganized. Six longer run reorganization outcomes are unknown due to their relatively recent occurrence. In the longer run there are 8 unqualified successes and 6 judgement calls.

It may be argued that all "judgement calls" should be considered a success because the performance has improved for at least one of the cooperatives. The reorganization has not benefited the strongest cooperative, but a weaker cooperative has been strengthen and the members of that cooperative have benefited. This improvement has been achieved, however, at the cost of a decline in the performance for the strongest participant. To classify this situation as something other than a judgement call requires assigning relative weights to the reorganization participants.

Conclusion

A primary objective of this research was to determine if cooperatives improve if the agricultural cooperatives that engage in mergers, consolidations or acquisitions improve their financial performance after reorganization. The results of both analyses presented in this paper

**FIGURE 2: Post-reorganization Profitability Compared to Pre-reorganization Profitability:
Success, Failure, and Judgement Calls**



indicate that anticipated financial benefits may not materialize after reorganization in both the short and the long run. The reorganization planners may have expected more than the circumstances merited. They may have over-estimated the cooperative's ability to integrate and manage a more complex operation.

Not only are there limited improvements in relative financial performance, but significant declines were found in many of the performance measures. If reorganizations create labor inefficiencies, increase risk through higher leverage ratios, and do not significantly increase profitability, then unqualified support for reorganization of local cooperatives should be questioned. It may be argued that the limited improvements in performance after reorganization may be attributable to the pre-reorganization weakness of the participants rather than inherent or systemic flaws of reorganization.

Although this research suggests that on average the financial consequences of reorganization may not be beneficial to the strongest cooperative, at least 33% of the observed reorganizations can be classified as unqualified successes. The analysis underscores the need for caution. Cooperative members must carefully appraise both the expected benefits and potential risks before deciding to reorganize.

Footnotes

¹ Grain cooperatives are defined as cooperatives that have at least 65 percent of total sales and 30 percent of gross margins from the grain commodity area. Petroleum cooperatives have at least 60 percent of total sales and 47 percent of gross margins in petroleum products. Cooperatives that do not meet the characteristics of either specialized cooperative type are classified as farm supply cooperatives. These defining parameters are determined and used by the St. Paul office of the Farm Credit System.

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