How Credit Union Mergers Affect Service to Members

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The Filene Research Institute is a non-profit organization dedicated to scientific and thoughtful analysis about issues affecting the future of consumer finance and credit unions. It supports research efforts that will ultimately enhance the well-being of consumers and will assist credit unions in adapting to rapidly changing economic, legal, and social environments.

Deeply imbedded in the credit union tradition is an ongoing search for better ways to understand and serve credit union members and the general public. Credit unions, like other democratic institutions, make great progress when they welcome and carefully consider high-quality research, new perspectives, and innovative, sometimes controversial, proposals. Open inquiry, the free flow of ideas, and debate are essential parts of the true democratic process. In this spirit, the Filene Research Institute grants researchers considerable latitude in their studies of high-priority consumer finance issues and encourages them to candidly communicate their findings and recommendations.

The name of the institute honors Edward A. Filene, the “father of the U.S. credit union movement.” He was an innovative leader who relied on insightful research and analysis when encouraging credit union development.

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Progress is the constant replacing of the best there is with something still better!

— Edward A. Filene
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Executive Summary

This study explores how credit union mergers affect service to members, and gives leaders the tools to measure merger impact on members of both credit unions. We examined 1,624 credit unions prior to merger and their performance for three years after a merger.

The study goes beyond traditional financial analysis and member surveys, and uses a sophisticated analytic technique that measures “member service efficiency.” This approach quantifies a credit union's member service level relative to other credit unions and time periods.

Member service efficiency is based upon techniques at the cutting edge of performance measurement research. The approach has been used in many other industries, and we have spent a number of years refining and perfecting its use for credit unions. Member service efficiency can be compared across credit unions of all asset sizes without putting smaller credit unions at a disadvantage. This makes it a versatile tool in evaluating mergers between two partners regardless of their relative sizes.

GENERAL FINDINGS

Acquiring credit unions served their members well prior to a merger, while target credit unions served their members less well. Acquiring credit unions on average were capable of improving their member service rating relative to best practice standards by just 14 percent prior to a merger. Target credit unions were capable of improving their member service levels by 25 percent.

In 80 percent of the mergers studied, members of target credit unions benefit significantly from a merger. The benefits are immediate and persist during the three-year study period.

Members of acquiring credit unions do not benefit significantly from the merger during the same period. However, their benefit levels do not decline, either. The study does not assess strategic benefits beyond the three-year period. However, it is reasonable to assume that long-term benefits are substantial in many cases.
CHARACTERISTICS OF SUCCESSFUL MERGERS

A number of benchmarks characterize mergers that benefit members of the acquiring credit union – that is, the credit union surviving the merger:

**A cquiring credit union benefit benchmarks**

- Target credit union is *relatively large*.
- A cquiring credit union has a *large number* of select employee groups (SEGs).
- A cquiring credit union has *experience* with mergers.

A merger that benefits members of the target credit union – that is, the one whose membership is merged into the acquiring credit union – also has typical characteristics:

**Target credit union benefit benchmarks**

- The target is *small* compared to the acquiring credit union.
- The target has *high delinquencies* and charge-offs.
- The target has a *high return* on assets (R O A).
- The target has a *small number of accounts* per member.
- The target combines with a credit union with a *similar loan/savings* ratio.
- The target has *few SEGs* and the acquiring credit union has a many SEGs.
- The target has prior *experience* with mergers.
- Either the target or the acquiring credit union has a *community charter*, but not both.

Mergers that benefit members of both credit unions have a number of distinctive characteristics as well:

**Both credit union benefit benchmarks**

- The merger is *small*. (Member-weighted assets of less than $80 million.)
- The member-weighted *capital-to-asset ratio* is relatively low (under 9.6%).
• The member-weighted *loan/savings ratio* is relatively high (greater than 71%).

These findings do not suggest that all credit unions should rush to merge. Many mergers in the study were triggered by dire financial situations in the target credit union and by other special situations. However, merger appears to benefit a significant number of members when conditions are favorable.
CHAPTER 1: 
Introduction

Over the period 1988-95, nearly 7,000 credit unions were involved in at least one merger.¹ Many more credit unions are likely to merge in the future. This study evaluates the impact of mergers on member service from the perspective of the target credit union, the acquiring credit union, and the members involved in the merger. How well or poorly credit union members fare as a result of a merger is a particularly important question for a financial cooperative.

Although members are central to the mission of a credit union, mergers are approved by the NCUA primarily on the basis of safety and soundness. This is important for the future viability of credit unions and the share insurance fund. This study assumes that mergers approved by the NCUA fulfill safety and soundness requirements. However, we believe that the effect on member service is an equally important criterion for judging mergers. Passing the safety and soundness test does not automatically imply passing the member service test.

APPROACH TO EVALUATING MERGERS

In some cases, credit unions merge in order to overcome financial distress. However, most mergers occur for, or are primarily influenced by, other reasons. In this study, we define merger success as improved services to members.

We evaluate how well merging credit unions serve their members before the merger, and how well the merged entity serves its members. This requires a measure of credit union performance that focuses on services to members. To measure the success of a merger, we calculate a service performance score for each credit union before a merger and for the combined credit union after the merger.

This study is based upon data from the NCUA Yearend Call Report and from CUNA’s Yearbook Questionnaire for the years 1988-1995. Using this data, we evaluated mergers that took place from 1989 to 1994. The data for 1988 gives pre-merger information for 1989 mergers, and data for 1995 gives post-merger information for 1994 mergers. We used this data to calculate service performance scores for each credit union before the merger, and for the combined credit union after the merger.

¹ Based upon data from CUNA, CUNA Mutual and NCUA.
THE SERVICE PERFORMANCE SCORE

The service performance score is a number that is greater than or equal to one. Credit unions managed to serve their members at a best-practice level receive a performance score of 1.0. Credit unions managed to serve their members less effectively receive a performance score greater than 1.0. The higher the performance score, the worse the performance.

Table 1.1 shows the average service performance scores of both the acquiring and target credit unions before the merger, and of the combined credit union after the merger. Members of target credit unions benefit on average by becoming members of a combined credit union with a higher service performance (score closer to 1.0) than before the merger. On average, members of acquiring credit unions are left essentially unaffected by a merger.

<table>
<thead>
<tr>
<th>Year</th>
<th>Average Service Performance Scores, by Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acquiring CU</td>
</tr>
<tr>
<td>Pre merger</td>
<td>1.146</td>
</tr>
<tr>
<td>Year of merger</td>
<td>1.140</td>
</tr>
<tr>
<td>1 year after</td>
<td>1.153</td>
</tr>
<tr>
<td>2 years after</td>
<td>1.159</td>
</tr>
<tr>
<td>3 years after</td>
<td>1.162</td>
</tr>
</tbody>
</table>

These scores have a direct and intuitive interpretation. The performance score minus one measures the percent by which a credit union could increase its output of services with no change in operating expenses, if it were managed at best-practice standards. For example, in Table 1.1, on average, acquiring credit unions before the merger are capable of increasing their output of services by just fourteen percent. However, target credit unions are managed much less effectively before the merger. On average, they are capable of improving their member service by twenty-five percent.

Table 1.1 also makes clear that whether a merger is successful in serving members better depends upon the group of members being considered. The relevant groups are: 1) members of the
acquiring credit union; 2) members of the target credit union; and 3) all the members affected by the merger.

The results shown in Table 1.1 give averages based on 1,624 mergers evaluated for this study. However, we also determined the pre-merger characteristics of partners that influenced the likelihood that a particular merger would succeed. We did this from the standpoint of the three groups of members.

**FOR THE ACQUIRING CREDIT UNION**

The characteristics of a merger that benefits members of the acquiring credit union include the following:

1. The target is relatively large (In practice, the target is usually small, but the acquiring credit union is usually better off if the target is larger. This is because a very small target compared to the acquiring credit union is likely to have an imperceptible effect on the acquiring credit union. However, our sample includes few cases of mergers between equals, so the results of the study may not hold for this type of merger.)

2. The acquiring credit union has a large number of select employee groups (SEGs)

3. The acquiring credit union has experience with mergers

The acquiring credit union is generally combining with a much smaller target. The larger is the target, the more likely it will have a perceptible and positive impact on the members of the acquiring credit union.

Experience matters. This can be experience directly related to mergers, or it can be experience gained by managing SEGs. A merger adds another diverse group to the field of membership. The management skills necessary to absorb the members of the target are similar to the management skills required to serve a large number of SEGs.
FOR THE TARGET CREDIT UNION

The characteristics of a merger that benefits members of the target credit union include the following:

1. The target is small compared to the acquiring credit union
2. The target has high delinquency and charge-offs
3. The target has a high return on assets (R O A)
4. The target has a small number of accounts per member
5. The target combines with an acquiring credit union with a similar ratio of loans to deposits
6. The target has few SEGs and the acquiring credit union has a large number of SEGs
7. The target has prior experience with mergers
8. Either the target or the acquiring credit union has a community charter, but not both

Typically, target credit unions are tiny relative to their acquiring credit unions. This means that the members of the target jump into a much larger asset class and gain access to services that only larger credit unions can provide. Also, a large acquiring credit union can absorb problems of the target credit union without being adversely affected. It follows that the worse off a target credit union is, the more its members benefit from merging. The target could be worse off in terms of delinquency, few SEGs, and a small number of accounts per member.

Members of the target credit union also benefit if the target has a high return on assets. This presents an opportunity for management of the acquiring credit union to convert retained earnings to services for former members of the target. Members of the target are more likely to benefit from a merger if the target has prior experience with a merger, although this is rarely the case. Members of the target credit union also benefit if one of the partners has a community charter, but not both.

Finally, the focus on borrowing or saving is important. Members of the target benefit from merger if the target combines with an acquiring credit union with a similar ratio of loans to deposits. A target with a high ratio of loans to deposits, for example, has a
field of membership that borrows. An acquiring credit union with a similarly high ratio of loans to deposits has a management that is focused and expert in lending.

FOR ALL MEMBERS INVOLVED IN THE MERGER

The characteristics of a merger that benefits all members involved in the merger include the following:

1. The merger is small (member-weighted assets less than $80 million)

2. The member-weighted capital to asset ratio is low (less than 9.6%)

3. The member-weighted ratio of loans to deposits is high (greater than 71%)\(^2\)

Small mergers are more likely to benefit the combined membership of the merged credit union. A merger tends to be small if the acquiring credit union is small. Members of the target typically benefit because they gain access to the superior management of the acquiring credit union. In the case where the acquiring credit union is small, there is room for the acquisition of the target to have a perceptible and positive impact on the operations of the acquiring credit union and all members are better off.

Mergers are more likely to be successful for all members if the member-weighted ratio of capital to assets is low. The ratio of capital to assets indicates the extent to which credit union management focuses on serving members, or focuses on safety and soundness. Where the member-weighted ratio of capital to assets is low, management of the newly merged credit union focuses on member service and the merger benefits all members. This assumes that the capital to asset ratio satisfies the minimum necessary for safety and soundness.

A high member-weighted ratio of loans to deposits is associated with a successful merger for all members. This indicates a focus on lending by the acquiring credit union in particular (the acquiring

\(^2\) The values in parentheses should be interpreted as very rough orders of magnitude, since they are based upon averages over the period 1988-95.
credit union dominates the member-weighted average). Lending expertise produces a successful merger.

**TRANSITION**

These conclusions are based upon a statistical analysis of 1,654 merging credit unions evaluated relative to non-merging credit unions over the years, 1988-1995. They are based upon a quantitative measure of how well a credit union serves its members.

The next chapter explains the measure of member service.
Chapter 2: Service to Members: The Key to Performance

State and federal regulators evaluate credit unions in terms of safety and soundness on a regular basis. However, a credit union that excels in safety and soundness may not excel in providing services to its members. The criteria used to measure safety and soundness differ considerably from the criteria used to measure member service.

This study compares how well the merged credit union serves its members with how well the participating credit unions served their members before the merger. This chapter describes the procedure for measuring service to members.

A GENERAL MODEL FOR MEASURING PERFORMANCE

Production Functions

Firms use inputs to produce outputs. The relationship between inputs and outputs is called a production function. Inefficient firms produce less outputs from their inputs because they are not managed as well as efficient firms.

A frontier production function identifies the maximum possible outputs from all combinations of inputs. Firms with the best managers attain production levels on the frontier. Firms with inferior managers attain production levels below the frontier. The worse is the management of the firm, the further production falls below the frontier.

A Graphic Illustration

To illustrate, see Appendix B for a technical description of the procedure. It involves a linear programming model of a credit union that is specified in terms of member service.
Firm E lies inside the frontier. It uses three inputs and produces four outputs. If firm E were managed well, it could produce six outputs from the three inputs. Point E* is the vertical projection of point E onto the frontier. Firm E is clearly managed poorly. A measure of the managerial performance of Firm E is the ratio of frontier output to actual output. In this example, $6 \div 4 = 1.5$. If firm E were managed well, it could obtain fifty percent more output from its input.

Firm C lies on the frontier. It is managed well. It is able to produce eight outputs from its four inputs. Frontier output is the same as actual output for firm C, so its ratio of frontier output to actual output is 1.0.

Firms that are managed well receive a performance score equal to one. Firms that are managed poorly receive a performance score greater than one. The higher the performance score, the worse the performance. The difference between the performance score and one measures the percent by which a firm could increase its output without changing its input, if it were managed well. For example, a credit union with a score of 1.20 has the potential to increase its output by $(1.20 - 1.0) = 0.20$, or 20% through
effective management. We call firms that are managed well efficient. We call firms that are managed poorly inefficient.

A small firm such as Firm A, with few inputs and few outputs, can be efficient. Similarly, a large firm such as Firm D, with many inputs and many outputs, can be efficient. It is also possible for a firm with many inputs and many outputs to be inefficient. This is firm F. And it is possible to have few inputs and few outputs to be inefficient. This is firm E. To be efficient requires attaining maximum output from input. This is possible for firms of all sizes.

In an actual example, the data points in Figure 2.1 would represent input-output combinations of operating firms. By connecting the outer dots with line segments, we assume that input-output combinations between these dots are also possible. This is a reasonable assumption if the outer data points are close to each other. This is likely to be the case if the number of firms in the analysis is large.

The efficiency frontier, and our efficiency measure based upon it, is grounded upon best practice. Firms are rendered inefficient because other firms are able to do better. These firms anchor the frontier. It is not a theoretical concept. In fact, the measure of performance is a conservative one. If there were more data, it is possible for the frontier to shift outward, rendering more firms inefficient. A firm that is inefficient is performing at least as poorly as its score. Similarly, an efficient firm is efficient at best. Most importantly, the evaluation of performance is relative to performance levels achieved by other operating firms. For this reason, the evaluation represents a realistic benchmark.

A MODEL OF CREDIT UNION PERFORMANCE

A Production Function for a Credit Union

A credit union uses resources (inputs) to produce services to members (outputs). The measure of performance based upon serving members is sensitive to the specification of its resources and services. This problem is complicated because we require data on inputs and outputs, ideally for all 11,000 plus credit unions in the country.
The measures of resources and services used in this study are the result of previous work that the authors conducted for the Filene Research Institute.\textsuperscript{4} We tried many alternative measures. We visited twenty-six credit unions throughout the country to test the results generated by different models. Credit union managers provided valuable advice and criticism. This process continued until the model passed this reality check.

**Credit Union Resources**

A credit union uses resources to produce services to members. Resources consist of staff, management, a primary location, branches and data processing equipment. These resources are the inputs in the credit union production function. The measure of these resources is total annual operating expense. We exclude provisions for loan and investment losses from total operating expense because they are the result of previous decisions, and we wish to measure current performance. Our data is from NCUA Yearend Call Reports.

**Credit Union Services**

A credit union provides services to its members in many important ways that are difficult or impossible to quantify. Friendly tellers and loan officers who know the community are important, but friendliness and community knowledge are not directly measurable. Although we could obtain some of this information from site visits, this study does not have the resources to visit all credit unions in the country. For this reason, measures of service are based upon data available for all credit unions. The two data sources we used are the NCUA Yearend Call Reports and the CUNA Yearbook Questionnaire.

We use six measures of service as outputs for credit unions: two measures of saving services, two measures of borrowing services, one measure of transactions, and one measure of service variety.

**Saving services**

It is important for a credit union to serve the saving needs of its members. The number of deposit accounts and the average deposit rate are measures of saving services.

The number of deposit accounts is used rather than their total value, because the number of accounts measures the ability of the credit union to penetrate the membership in terms of saving services. For this number, we use the average number of accounts outstanding during the past twelve months, excluding share drafts. We exclude share drafts because they are used as a proxy for transactions as explained below.

The average deposit rate indicates the ability of the credit union to offer attractive saving rates to its members. The higher the average deposit rate, the better the credit union serves the saving needs of its members. This is in sharp contrast to CAMEL, where a high deposit rate reduces net income. Serving the saving needs of members is not the same as serving the safety and soundness needs of regulators. The average deposit rate is calculated by dividing dividends paid by the average dollar value of shares outstanding.

**Borrowing services**

It is important for a credit union to serve the borrowing needs of its members. The number of loan accounts and the average loan rate are measures of borrowing services.

The number of loan accounts is used rather than the total loan value, because the number of accounts measures the ability of the credit union to penetrate the membership in terms of borrowing services. We exclude purchased loans and loans to non-members, because they are not serving the borrowing needs of members.

The average loan rate indicates the ability of the credit union to offer attractive borrowing rates to its members. The lower the average loan rate, the better the credit union serves the borrowing needs of its members. We calculate the average loan rate by dividing interest income from loans by the average dollar value of loans outstanding.

**Transactions volume**

Transactions are also a service to members. Since transactions generate costs, it is important to include them as a service, or output. If transactions were absent from the service specification of the model, credit unions that served their members with an above-average number of transactions would tend to be rated
poorly, since the model would include the contribution to costs without including the associated benefit to members.

Although credit union managers generally know the total number of their transactions, this information is not available in the Call Reports. We use the number of share draft accounts as a proxy for the number of transactions. This does not imply that the number of share draft accounts equals the number of transactions. Rather, it is based upon the assumption that credit unions that have more share draft accounts tend to have a higher transaction volume. For example, a credit union that offers zero share draft accounts does not have zero transactions, but would likely have fewer transactions than a credit union with a large number of share draft accounts.

**Service variety**

Serving members involves more than low loan rates, high deposit rates, and transactions. Members also value credit cards, debit cards, ATMs, direct deposit, loan-by-phone, audio response and other services. In studying the effect of mergers on member service, including a measure of these non-rate services is important. For example, when a small credit union merges with a large credit union, the members of the small credit union may benefit by obtaining access to a greater variety of services.

The service variety measure is calculated from CU NA’s Yearbook Questionnaire, which is an annual survey of the services offered by credit unions. Between twenty-seven and thirty-one services are listed in the survey, depending upon the year. Service variety is the proportion of the maximum services offered by a credit union.

**Income from fees and income from capital**

Some credit unions can serve members better because they obtain revenue from fees that can be used to provide favorable loan and deposit rates and other services. Some credit unions are able to serve members better because they have a large amount of capital that generates income that can be used to provide favorable loan and deposit rates and other services. The imposition of fees is to some extent a philosophical issue. Free money is the result of past decisions that generate capital. This research makes some adjustments to level the playing field with respect to fees and free money.
To level the playing field, loan and deposit rates are adjusted for the amount of fee and capital income available. The adjustment is to raise the average loan rate and to lower the average deposit rate. The division of the adjustment between loans and deposits is determined by the relative importance of these two elements.

Consider an example. Suppose loans and deposits are each fifty percent of loans plus deposits. Then, half of fee and capital income is added to the numerator used to calculate the average loan rate. This raises the average loan rate. Half of fee and capital income is subtracted from the numerator used to calculate the average deposit rate. This lowers the average deposit rate.

Loan and deposit rates are adjusted to be on the basis of zero income from capital and zero income from fees. This prevents high fee and capital income credit unions from having an advantage over low fee and capital income credit unions in our measure of efficiency. This adjustment does assume that income from fees and capital is used to provide more favorable rates and not used for other member services, or added to capital.

A SERVICE EVALUATION OF CREDIT UNIONS

We’ll use the preceding material to construct a service performance score for every credit union. This quantitative service evaluation of credit unions compares credit unions of a similar size as measured by annual operating expense. Small credit unions are not rendered poor service providers because larger credit unions with more resources can provide more services. If a credit union receives a poor service performance score, it is because other credit unions with similar resources are able to serve members better.

In constructing the service performance score for a credit union, we take into account the mix of services it provides. Credit unions are very heterogeneous. Some have fields of membership that need borrowing more than saving. Some have greater technological demands. A good credit union tailors its mix of services to the needs of its members. For example, a well-managed saver-oriented credit union may provide outstanding saving services, but less comprehensive borrowing services. Our performance measure does not give this credit union a poor performance score because another credit union with similar
resources serves borrowers better. The saver-oriented credit union receives a poor performance score only if there are other saver-oriented credit unions with similar resources that serve savers and borrowers better. This is the multidimensional interpretation of Figure 2.1.

The service performance scores we calculate are numbers that can be compared across credit unions. If a credit union receives a score equal to 1.15 for example, it means that members would receive 15 percent more of all six services for the same operating expense if the credit union were managed to best practice. Another credit union with a performance score equal to 1.09 is still not performing up to best practice (represented by a 1.0 score), but it is performing better than the credit union with a score of 1.15.

**Service Performance of Credit Unions**

This study calculates the service performance score for credit unions involved in mergers, yielding evaluations for 1,654 credit unions. The average service performance score for all these credit unions before merger is 1.17. This number is stable across years. It suggests that, on average, a credit in this group could increase all six services by seventeen percent with no increase in operating expense. Fifty-four of the 1,654 credit unions perform at a best practice level and receive a performance score equal to one. These credit unions set the standard for serving members. The remaining credit unions perform below best practice and receive an average performance score equal to 1.18. These results are based only on credit unions involved in merger, so the figures are not necessarily representative of the whole population of credit unions.

**TRANSITION**

The next chapter provides an overview of credit union mergers. It focuses on the facts. How many credit unions merge each year? How big are they? Are they financially sound? What is their field of membership? How do the answers to these questions compare for acquiring and target credit unions?
CHAPTER 3:
Credit Union
Mergers:
Facts & Figures

MERGER DATA

Examining the data on credit union mergers is a factual overview, not a rigorous economic analysis. The facts motivate the economic model to come.

Our study is based upon data available from the NCUA Yearend Call Report and CUNA’s Yearbook Questionnaire for the years 1988 – 1995. We evaluate mergers that occurred from 1989 to 1994. Data for 1988 provides pre-merger information for 1989 mergers, and data for 1995 provides post merger information for 1994 mergers. We use this data to calculate service performance scores for each credit union before the merger and for the combined credit union after the merger.

To calculate the service performance score requires data on operating expense and the six member services described in chapter 2. The NCUA Yearend Call Report provides data for operating expense and five of the six services. Data for the variety of service measures is obtained from the CUNA Yearbook Questionnaire. This is a voluntary survey. The response rate is typically around sixty-seven percent, but much lower for target credit unions on the verge of merger. For this reason, the number of credit unions in the sample for this study is lower than the number of credit unions that merged in the period of study.5

Over the period 1988 – 1995, there are approximately 100,000 annual observations on credit unions and 6,804 credit unions merged. A n annual observation is a credit union that operated for a calendar year. Table 3.1 describes the sample for this study. The sample consists of 48,171 annual observations on credit unions and 1,654 credit unions that merged. Of the 1,654 credit unions that merged, 1,215 are acquiring credit unions and 439 are targets. The number of acquiring credit unions is greater than the number of target credit unions because data is more likely to be incomplete for target credit unions. In particular, a target credit union that is on the verge of merger may choose not to submit the Yearbook Questionnaire.

5 See Appendix A for a detailed description of the procedure used to screen the data.
We analyzed approximately half of all credit unions that existed over the period and approximately one third of the credit unions that merged. We calculated service performance scores for all target and acquiring credit unions before merger and after merger for the new entity, using the procedure described in chapter 2. Note that this requires data on non-merging credit unions.

### Characteristics of Target and Acquiring Credit Unions

Table 3.2 compares the characteristics of the acquiring and target credit unions. Entries in the table are the average values over the years 1989-1994. The last column contains data for all credit unions (population), including those uninvolved in mergers. This describes the typical credit union and serves as a useful reference.
Characteristics of target credit unions

Target credit unions are much smaller than acquiring credit unions on average and much smaller than the typical credit union as well. This holds for all of the size measures—assets, members, deposits, loans, accounts, branches, and SEGs. For example, the average target has assets of $2.5 million compared to $79.5 million for the average acquiring credit union and $20.1 million for the typical credit union.

Targets tend to have high delinquencies and charge-offs and low return on assets. However, they also have high capital. Their delinquency and charge-off rates and their return on assets are worse than both the average acquiring credit union and the typical credit union, but their capital ratio is higher. Return on assets, for example, is essentially zero, compared to seventy-five basis points.
for the average acquiring credit union and 107 basis points for the typical credit union.

However, the average target has a higher capital to asset ratio (11.6%) than either the average acquiring credit union (9.6%) or the typical credit union (7.7%). The loan to deposit ratio is essentially comparable for the three groups. Proportionately fewer target credit unions (5.4%) have a community charter than acquiring credit unions (10.7%) or credit unions in general (6.6%).

In summary, the target credit union tends to be small, to have poor asset quality, a low ROA, yet has a high capital to asset ratio.

**Characteristics of acquiring credit unions**

The average acquiring credit union is large compared to both the average target credit union and the typical credit union according to all size measures. For example, the average acquiring credit union has 21,000 members compared to 1,100 for the average target and 4,300 for the typical credit union. Acquiring credit unions have stronger loan portfolios than targets on average, but slightly weaker loan portfolios than the typical credit union, based on delinquencies and charge-offs. Return on assets for acquiring credit unions is far higher than targets and notably less than the typical credit union. Acquiring credit unions have a higher capital ratio than the typical credit, yet have a considerably lower capital ratio than targets. The average acquiring credit union is more likely to have a community charter than either the target or the typical credit union. And the average acquiring credit union has much more experience with mergers than the target.

In summary, the acquiring credit union tends to be large, to have average asset quality, a lower than average ROA, an above average capital to asset ratio, and to prior experience with mergers.

**TRANSITION**

The next chapter evaluates credit union mergers from the perspective of members. The ingredients are in place. The basis for the evaluation of mergers is the service performance score. It is a quantitative measure of how well a credit union serves its members.
How well have members been served by mergers among credit unions? What are the characteristics of mergers that serve members well? Of mergers that serve members poorly?
In this chapter we use service performance scores to evaluate the effect of mergers on members. We calculate scores for target and acquiring credit unions to measure how well members are served before the merger. Then we calculate scores for the merged credit union up to three years following the merger. To determine the effect of mergers on member service we compare the service performance score of the merged credit union to the pre-merger scores of the participants in the merger.

Mergers are successful if members are served better after the merger than they were before the merger. This holds for some merger cases and not for others. Members of the target credit union may be served better by the merger, and members of the acquired credit may be served worse by the merger, for example. This suggests three approaches to evaluating the success of mergers: the success of a merger in providing service to members of the acquiring credit union; to members of the target credit union; and the success of a merger from in providing services to members of both participating credit unions.

Since some mergers succeed and others do not, we also evaluate which characteristics of participating credit unions increase the likelihood of success. This information can guide managers who are considering a particular merger and are concerned with its potential effect on member service.

**SERVICE PERFORMANCE SCORES OF MERGING CREDIT UNIONS**

Table 4.1 summarizes our results. It shows service performance scores for both target and acquiring credit unions before the merger, and annual scores for the merged credit union after the merger.
The service performance score is a number greater than or equal to one. If a credit union serves its members at a best-practice level, it receives a score of 1.0. If it serves its members at a level below best practice, it receives a score greater than one. The higher the service performance score, the worse the performance. The service performance score minus 1.0 measures the extent to which a credit union could increase its services to members with no change in annual operating expense if it performed at the best-practice level. For example, target credit unions have a service performance score equal to 1.248 the year before merging, on average. These credit unions could provide 24.8% more service to their members if they were managed at the best-practice standard.

**Table 4.1**

Pre and Post Merger Service Performance Scores (averages)

<table>
<thead>
<tr>
<th>Year</th>
<th>Acquiring CU</th>
<th>Merged CU</th>
<th>Target CU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre merger</td>
<td>1.146</td>
<td></td>
<td>1.248</td>
</tr>
<tr>
<td>Year of merger</td>
<td>1.140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year after</td>
<td>1.153</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years after</td>
<td>1.159</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 years after</td>
<td>1.162</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Acquiring credit unions serve members quite well prior to a merger. On average, they are capable of improving their member service by just fourteen percent. Target credit unions perform much less effectively before the merger. On average, they are capable of improving their member service by twenty-five percent.

It is encouraging that the superior credit unions typically acquire the inferior credit unions, rather than the reverse. This indicates that members of target credit unions are served better, on average, as a result of merger by gaining access to the managerial skills of the acquiring credit union.
Mergers Benefit Members of Target Credit Unions

Members of target credit unions are better off as a result of merger. This improvement in service appears the year the merger takes place and continues for the period one to three years that we track the data. The service performance score of the merged credit union is lower (better performance) than the pre-merger score for the target, beginning in the year the merger takes place, and continuing thereafter.

The sources of the benefit to members of the target credit union could be the superior managerial skills of the acquiring credit union or access to a greater variety of services. This underscores the importance of including a measure of service variety in the service performance score.

Mergers Do Not Hurt Members of Acquiring Credit Unions

We observe very little change in the service performance scores of the merged credit union compared to the pre-merger score of the acquiring credit union. On average, members of the acquiring credit union do not benefit as a result of the merger, neither are they worse off. We see no evidence of a period of adjustment or restructuring following a merger that adversely affects member service. This holds for up to three years after the merger takes place. Managers of acquiring credit unions typically absorb the targets without compromising service to their members.

Mergers Have Strengthened Service to Members in General

The service performance scores of target credit unions have improved on average due to merger, while the service performance scores of acquiring credit union have remained essentially the same. Members of target credit unions are better off and members of acquiring credit unions are no worse off, which means that, overall, mergers have provided a net benefit to members.
THE CHARACTERISTICS OF A SUCCESSFUL MERGER

Table 4.1 shows average service performance scores for acquiring and target credit unions. However, just because members of target credit unions experience an improvement in services after a merger on average, does not imply that all target credit unions benefit from merger. The same applies to members of acquiring credit unions. Table 4.2 shows the percent of acquiring and target credit unions that benefited from merger.

<table>
<thead>
<tr>
<th>Group</th>
<th>Year of merger</th>
<th>1 year after</th>
<th>2 years after</th>
<th>3 years after</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquiring</td>
<td>53%</td>
<td>50%</td>
<td>49%</td>
<td>51%</td>
</tr>
<tr>
<td>Target</td>
<td>86%</td>
<td>79%</td>
<td>82%</td>
<td>76%</td>
</tr>
</tbody>
</table>

Even though members of acquiring credit unions were unaffected by mergers on average, in approximately 50 percent of mergers, service to members deteriorated relative to other credit unions. For members of target credit unions, service deteriorated for only about 20 percent of mergers. Since member service did not improve for all mergers, it is useful to determine the characteristics of mergers that do benefit members.

Below we show characteristics of prospective merger partners that might expect to influence whether a merger benefits members.¹

Size Indicators

Size measures are assets, number of members or number of accounts. It makes little difference which size measure is used in the analysis. The results are based upon using assets as the size indicator.

Financial Health Indicators

Financial health measures are return on assets, capital to asset ratio, delinquencies, and charge-offs. Since charge-off policies

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¹ The data source is the NCUA Yearend Call Report
vary by credit union, delinquencies and charge-offs are summed to create a combined measure called “badloan.”

**Operational Efficiency Indicators**

Measures of operational efficiency are total accounts per member and the ratio of loans to deposits. A accounts-per-member is a proxy for transactions per member. A credit union can provide many services to fewer members more efficiently than it can provide fewer services to many members. Similarly, the ratio of loans to deposits is a measure of how successfully the credit union has penetrated the membership in terms of providing lending services.

**Other Indicators**

Other characteristics of merger participants that influence the success of a merger are number of branches, community charter, number of SEGs, number of prior mergers since 1988, and number of years since last merger.

**EXPLANATIONS FOR SUCCESSFUL Mergers**

We use a technique called multiple regression analysis to test the correlation between each individual characteristic and merger success, controlling for the influences of the other characteristics. The results take the following form: a characteristic is positively related to merger success, negatively related to merger success or irrelevant to merger success.7

Characteristics are related to merger success from the perspective of the target credit union, from the perspective of the acquiring credit union and from the perspective of both merger partners.

**From the Perspective of the Target Credit Union**

**Assets:** Merger is more likely to benefit members of the target credit union when the acquiring credit union is much larger than the target. We offer three possible explanations for this result. (1) If there are large scale economies to producing credit union services, then smaller targets have the most potential gain through unit cost reductions by being acquired by a larger credit union.

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7 See Appendix C for technical details
(2) Large credit unions generally have a wide variety of services. (3) The smaller the target compared to the acquiring credit union, the easier it is for the acquiring credit union to assimilate the target.

**Bad loans:** The worse the quality of the loan portfolio of the target, the more likely merger is to benefit the members of the target. The very poor asset quality of targets on average generate essentially zero net income. This inhibits the ability of the credit union to offer attractive loan and saving rates to members. In addition, managers of the acquiring credit union have expertise in collection that can be applied to the target. The target has room to improve, and the merged credit union is able to realize that improvement and translate it into better service to the members of the target.

**Return on assets (ROA):** The higher the target's ROA, the more likely a merger will be successful. Although ROA is important for safety and soundness, it comes at the expense of service to current members in the form of favorable rates and other services. We cannot know precisely why this result occurs. However, targets typically have high capital, and the management of the acquiring credit union could reduce the emphasis on capital building and offer more attractive rates on loans and savings. To be fair however, the typical target has a shaky loan portfolio and is probably under regulatory pressure to emphasize ROA in order to survive. Merger relieves the target of this regulatory yoke and its members benefit. This is another example of a positive relationship between room to improve and merger success.

Also the larger the difference between the target's ROA and the ROA for the acquiring credit union, the more likely is the merger to be successful for members of the target. On average, the ROA for targets is almost zero. Members of targets benefit by combining with a credit union with a higher ROA by gaining access to managerial expertise. Merger success is associated with complementary differences between participants.

**Accounts per member:** The larger the difference between total accounts per member for the acquiring credit union and the target, the more likely the merger is to succeed. On average, targets have 1.56 accounts per member and acquiring credit unions have 1.82 accounts per member. The typical acquiring credit union has
achieved operational efficiency gains as a result of providing members with maximum services. Management of the acquiring credit union can apply its expertise to serve members of the target more effectively than they had been previously. Members of the target benefit as a result. This is another example of a positive relation between room to improve and merger success.

**Loan to deposit ratio:** The smaller the difference in the loan to deposit ratios between the merger participants, the more likely the merger is to be successful. Mergers between credit unions with similar loan to deposit ratios tend to benefit members of the target. The loan to deposit ratio is an indicator of whether management is focused on the lending side or the deposit side, and presumably, this reflects the needs of the field of membership. Members of the target benefit by combining with a credit union that has a similar focus. For example, if the acquiring credit union has a high loan to deposit ratio, then management has particular expertise in lending. Targets are more likely to benefit from this expertise in lending if their field of membership tends to borrow.

**SEGs:** The greater the difference in the number of SEGs for the acquiring credit union and the number of SEGs for the target, the more likely the merger will succeed. (Note that the typical target has only 3.7 SEGs compared to 75.5 for the typical acquiring credit union.) Targets with fewer SEGs are more easily absorbed by the acquirer since they have a more homogenous field of membership. Acquiring credit unions with more SEGs have greater experience managing diverse groups. This experience enables them to manage members of the target more effectively. This is an example of learning by doing.

**Prior merger experience:** The more experience the target has with mergers in the past, the more likely it is to benefit from merger. The measure of past merger experience is the number of mergers since 1988. For target credit unions, this number is very small. The average is 0.04. If a target has experience with mergers, this means that it acquired another credit union. This is rare. Nonetheless, past merger experience does contribute to the success of the current merger. It suggests that management of the target is familiar with the problems associated with a merger. It can use this experience to prepare the target for assimilation into the acquirer, and it can use this information to select an appropriate suitor. This is another example of learning by doing.
One community charter: Merger is more likely to benefit members of the target if one but not both of the participants has a community charter. Acquiring credit unions are twice as likely to have a community charter (10.7%) than are targets (5.4%). A community charter provides an acquiring credit union with experience in dealing with diverse groups. This experience transfers to the problem of penetrating the membership of the target. This is a third example of learning by doing.

If both credit unions have community charters, a merger is not beneficial to members of the target credit union. Combining two community charters is a particularly disruptive merger in terms of the difficulties associated with serving a heterogeneous field of membership.

Year of merger: Most of the benefits to members of the target are realized during the year of the merger. These benefits overwhelm any re-structuring or assimilation costs. The benefits are larger when re-structuring costs are low, but despite these costs, members of the target are better off immediately. Since targets are so much smaller than the acquiring credit unions, these immediate benefits to the target may stem from members’ access to the expanded variety of services.

From the Perspective of the Acquiring Credit Union

Assets: The larger the target, the more likely merger is to benefit members of the acquiring credit union. The typical merger is between a relatively large acquiring credit union ($79.5 million) and a minuscule target ($2.5 million). Even if the merger has synergies, cost savings and complementarities, if the target is very small, the effect on the members of the acquiring credit union is likely to be imperceptible.

SEGs: An acquiring credit union is more likely to have a successful merger experience, the greater the number of SEGs it has. SEGs provide it with experience serving diverse groups. Given the average small size of targets, assimilating a target is similar to acquiring a new SEG in many cases. Members of the acquiring credit union tend to benefit from merger if management can transfer its experience dealing with multiple SEGs to dealing with the merger. This is an example of learning by doing.
Prior mergers: Merger is more likely to benefit members of the acquiring credit union, the greater the number of prior mergers the acquiring credit union has experienced. Prior mergers provide management with merger experience that benefits the merger. This is a second example of learning by doing.

Year of merger: Members of the acquiring credit union realize the benefits from merger in the year the merger occurs. There is no waiting. Any re-structuring costs are overwhelmed by other benefits.

Members of Both Credit Unions

If members of the acquiring and target credit unions benefit from merger, then the merger is an unqualified success. All members are better off. If members of either the acquiring or target credit union benefit from merger, and members of the other participant are made worse off by merger, then the success of the merger might appear questionable. However, looking at the merger from the point of view of the credit union members involved, this ambiguity can be resolved. To do so, we compare the member-weighted average of the pre-merger scores to the score of the merged credit union. This weights the effect of the merger more heavily on the credit union with more members.

We use the same procedure to identify the characteristics of a successful merger from the perspective of all members involved. The pre-merger score is the member-weighted average of the pre-merger scores of the participants. We also examine post-merger scores for the year of the merger, one year after, two years after, and three years after. The difference between pre and post merger scores measures merger success. This measure is related to characteristics known before the merger. These characteristics are member-weighted averages of the characteristics of the participants. The results follow.

Assets: Smaller mergers are more likely to be successful. Since acquiring credit unions are generally very large compared to targets, the effect of the merger on the acquiring credit union dominates the member-weighted aggregate of merger success. The smaller the acquiring credit union, the more likely the merger is to have a perceptible impact on its members. To put this result in perspective, the average acquiring credit union had assets of $79.5 million over the period of this study.
**Capital to assets ratio:** The higher the ratio of capital to assets before the merger, the less likely the merger is to succeed. A high ratio of capital to assets suggests that the merger participants are more focused on safety and soundness than on serving members. In this case, the effects of the merger are less likely to benefit members in terms of services. This assumes that most credit unions meet the minimum ratio of capital to assets required to satisfy the regulator.

**Loan to deposit ratio:** The higher the ratio of loans to deposits, the more likely the merger will succeed. A high ratio of loans to deposits suggests that managers are focused on lending. This is a central mission for a credit union. Mergers between credit unions with a lending focus tend to benefit all members involved.
Conclusion

This is an exciting time to be involved in the financial services industry. Change is rapid and unpredictable. Mergers among large banks are rampant – Bank America and NationsBank, Fleet Bank and First Boston, Bank One and First Chicago, Citibank and Travelers. A proposed merger in France may result in the first trillion-dollar bank.

Although credit unions are much smaller than banks, they operate in the same environment and compete for the same customers. Just as banks are merging, so are credit unions. And just as big banks are merging, we believe that more big credit unions are likely to merge in the future. Past mergers tend to involve acquiring credit unions that are very large compared to targets. We find very few examples of credit union mergers between equals. Mergers between large acquiring credit unions and large targets may very well behave differently from the mergers examined in this study.
APPENDIX A: The Procedure for Screening the Data

The following screens were used to obtain the data set on merging credit unions:

1. A credit union had to return both the Yearend Call Report and the Yearbook Questionnaire for at least one year. This information is necessary to calculate the service performance score.

2. A credit union was eliminated if it reported negative values for entries that cannot be negative.

3. A credit union was eliminated if it failed to answer all of the questions in the Yearbook Questionnaire. The variety measure cannot be calculated unless the Yearbook Questionnaire is answered completely.

4. A credit union was eliminated if it appeared in either the top or bottom one percent for either average deposit size or average loan size. These extreme values are probably the result of mistakes in reporting the value or the number of loans or deposits.

5. After screens 1 – 4, a credit union was eliminated if there was not data for at least two consecutive years. This is necessary because the number of accounts, loans and deposits are calculated by taking the average of the number at the end of the previous year and the end of the current year.

Screen 1 eliminated 27 percent of all credit unions. Screens 2 – 5 eliminated an additional 27 percent of credit unions. The credit unions that survived all five screens are described in Tables 3.1 and 3.2.
APPENDIX B: The Linear Programming Model

Service performance scores are based upon a linear programming model. The model is described as follows. Denote a particular year by \( t, t = 1, \ldots, 8 \), for the eight sample years from 1988 through 1995. Denote a particular credit union with a subscript \( i, i = 1, \ldots, I_t \), where there are \( I_t \) credit unions in the sample in year \( t \) (values of \( I_t \) are given in column (2) of Table 3.1). Let \( x_i^t \) denote the quantity of the single resource used by credit union \( i \) in year \( t \), and let \( y_{mi}^t \) denote the quantity of the \( m \)-th member service provided by credit union \( i \) in year \( t \), where \( m = 1, \ldots, 6 \). Then the member service performance of credit union \( "o" \) in year \( t \) can be determined from the solution to the linear program:

\[
\begin{align*}
\max_{\phi^i, \lambda_i^t} \phi^i & \quad \text{subject to} \quad \phi^i y_{mo}^t \leq \sum_{i} \lambda_i^t y_{mi}^t, \quad m = 1, \ldots, 6 \\
\sum_{i} \lambda_i^t x_i^t & \leq x_o^t \\
\lambda_i^t & \geq 0 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad i = 1, \ldots, I_t \\
\sum_{i} \lambda_i^t & = 1.
\end{align*}
\]

The constraints of this linear program construct production frontier, depicted in Figure 2.1. The objective of this linear program is to find the maximum equiproportionate expansion \( \phi^i \) of each service of a credit union permitted by the frontier. This is illustrated for point \( E \) in Figure 2.1. The optimal value of \( \phi^i \) satisfies \( \phi^i \geq 1 \), with \( \phi^i = 1 \) indicating efficient performance relative to best practice observed in the sample in year \( t \). The magnitude of \( \phi^i > 1 \) indicates the extent of inefficiency. The effect of merger on member service is determined by comparing the values of \( \phi^i \) for acquiring and target credit unions before the merger, with the values of \( \phi^{i+s}, s = 0,1,2,3 \), for the merged credit union the year of the merger (\( s=0 \)) and years following the merger (\( s=1,2,3 \)).

This linear program is solved \( I_t \) times for each year during the 1988-1995 period. Thus within each year all \( I_t \) credit unions in the sample are used to construct the production frontier. Best practice is defined by the most efficient credit unions, not just by the most efficient merging credit unions. However, service performance scores are calculated for merging credit unions only. For example, if a pair of credit unions merges in year \( t \), the service performance scores are calculated in year \( t-1 \) relative to the entire sample \( I_t \) in year \( t-1 \). The service performance score for the merged credit union is calculated in year \( t \) relative to the entire sample \( I_t \) in year \( t \). This exercise continues for up to three years subsequent to
the merger. The service performance histories of each credit union which merges at least once during the sample period are then provided by \( \{\phi_t^{-1}, \phi_t^s, s = 0, 1, 2, 3\} \). These histories are often incomplete for either or both of the acquiring and target credit unions, however, due to missing data.
APPENDIX C: The Regression Models

The regression model links merger success with the pre-merger characteristics of merger participants. The model is based on the service performance histories described in Appendix B and the pre-merger characteristics discussed in Chapter 4.

The first step is to group all merging credit unions for which there are calculations of at least $\phi_{t-1}$ and $\phi_t$, and perhaps $\phi_{t+1}$, $\phi_{t+2}$ and $\phi_{t+3}$ as well. Although this procedure involves grouping credit unions that merged in different years, it causes no difficulties because service performance scores are calculated relative to contemporaneous credit unions.

The first pair of regressions takes an aggregate view of all credit unions that merged at least once during the sample period:

$$\ln(\frac{\phi_{t-1}}{\phi_{t+s}})_i = \beta_0 + \beta_1 \ln\text{ASSETS}_i + \beta_2 \ln\text{BAD LOAN}_i + \beta_3 \ln\text{BRANCHES}_i$$

$$+ \beta_4 \ln\text{CAPITAL/ASSETS}_i + \beta_5 \ln\text{LOANS/DEPOSITS}_i + \beta_6 \ln\text{COMMUNITY CHARTER}_i + \beta_7 \ln\text{SEGS}_i + \beta_8 \ln\text{PRIOR MERGERS}_i + \beta_9 \ln\text{ACCOUNTS/MEMBER}_i + \beta_{10} \ln\text{ROA}_i + \beta_{11} \text{YEAR OF MERGER}_i$$

$$+ \beta_{12} \text{MERGER YEAR} + 1_i + \beta_{13} \text{MERGER YEAR} + 2_i + \beta_{14} \text{MERGER YEAR} + 3_i, \quad s = 0,1,2,3$$

$$\ln(\frac{\phi_{t-1}}{\phi_{t+s}})_j = \beta_0 + \beta_1 \ln\text{ASSETS}_j + \beta_2 \ln\text{BAD LOAN}_j + \beta_3 \ln\text{BRANCHES}_j$$

$$+ \beta_4 \ln\text{CAPITAL/ASSETS}_j + \beta_5 \ln\text{LOANS/DEPOSITS}_j + \beta_6 \ln\text{COMMUNITY CHARTER}_j + \beta_7 \ln\text{SEGS}_j + \beta_8 \ln\text{PRIOR MERGERS}_j + \beta_9 \ln\text{ACCOUNTS/MEMBER}_j + \beta_{10} \ln\text{ROA}_j + \beta_{11} \text{YEAR OF MERGER}_j$$

$$+ b_{12} \text{MERGER YEAR} + 1_j + b_{13} \text{MERGER YEAR} + 2_j + b_{14} \text{MERGER YEAR} + 3_j, \quad s = 0,1,2,3,$$

where the subscript $i$ indexes the set of all acquiring credit unions in the sample, and the subscript $j$ indexes the set of all target credit unions in the sample.
The second pair of regressions focuses on mergers for which there is complete data on the target and acquiring credit unions. With this data set, it is possible to explain merger success by differences and ratios of the pre-merger characteristics of the participants. The data used in the previous pair of regressions is modified as follows:

1. The number of observations declines to 348 for the acquiring regression and 309 for the target regression.

2. Pre-merger characteristics are replaced with the ratio of the smaller to the larger value for the merger participants. This applies to \( \text{ASSETS}, \ \text{BADLOAN}, \ \text{CAPITAL/ASSETS}, \ \text{LOANS/DEPOSITS}, \ \text{ACCOUNTS/MEMBER} \) and \( \text{ROA} \). An increase in the ratio indicates that the merger participants are more similar in terms of the particular characteristic.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>All Merging Credit Unions</th>
<th>Acquiring</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-0.013</td>
<td>0.41</td>
<td>0.127</td>
</tr>
<tr>
<td>( \ln \text{assets} )</td>
<td>0.001</td>
<td>0.29</td>
<td>0.003</td>
</tr>
<tr>
<td>( \ln \text{badloan} )</td>
<td>0.001</td>
<td>0.59</td>
<td>0.005</td>
</tr>
<tr>
<td>( \ln \text{branches} )</td>
<td>0.000</td>
<td>0.79</td>
<td>-0.001</td>
</tr>
<tr>
<td>( \ln \text{(capital/assets)} )</td>
<td>-0.001</td>
<td>0.81</td>
<td>-0.004</td>
</tr>
<tr>
<td>( \ln \text{(loan/deposit)} )</td>
<td>-0.001</td>
<td>0.50</td>
<td>0.004</td>
</tr>
<tr>
<td>\text{Comm charter}</td>
<td>0.001</td>
<td>0.23</td>
<td>0.013</td>
</tr>
<tr>
<td>( \ln \text{SEGs} )</td>
<td>0.001</td>
<td>0.04</td>
<td>0.001</td>
</tr>
<tr>
<td>( \ln \text{prior mergers} )</td>
<td>0.000</td>
<td>0.11</td>
<td>0.004</td>
</tr>
<tr>
<td>( \ln \text{(accts/mem)} )</td>
<td>-0.000</td>
<td>0.89</td>
<td>-0.005</td>
</tr>
<tr>
<td>( \ln \text{ROA} )</td>
<td>0.002</td>
<td>0.22</td>
<td>0.006</td>
</tr>
<tr>
<td>\text{Yr of merger dum}</td>
<td>0.010</td>
<td>0.00</td>
<td>0.037</td>
</tr>
<tr>
<td><strong>F-statistic</strong></td>
<td>2.27</td>
<td>0.01</td>
<td>4.215</td>
</tr>
<tr>
<td><strong>Mean dep var</strong></td>
<td>-0.006</td>
<td></td>
<td>0.082</td>
</tr>
<tr>
<td><strong>S.D. dep var</strong></td>
<td>0.057</td>
<td></td>
<td>0.103</td>
</tr>
<tr>
<td><strong>Adj R-squared</strong></td>
<td>0.01</td>
<td></td>
<td>0.06</td>
</tr>
<tr>
<td><strong>Number of obs</strong></td>
<td>1703</td>
<td></td>
<td>520</td>
</tr>
</tbody>
</table>

Table A C.1
The Determinants of Merger Success: The Aggregate View

Dependent Variable = \( \ln (\text{pre-merger efficiency/post-merger efficiency}) \)
3. Pre-merger characteristics are replaced with difference between the larger and the smaller for the merger participants. This applies to BRANCHES, SEGs and PRIOR Mergers. An increase in this difference indicates that the merger participants are more different in terms of the particular characteristic.

4. The community charter dummy is replaced with a pair of dummies, ONE COMMUNITY CHARTER and BOTH COMMUNITY CHARTER. This distinguishes mergers in which only one partner has a community charter from mergers in which both partners have a community charter.

Table A C.2
The Determinants of Merger Success: The Relative View

Dependent Variable = ln (pre-merger efficiency / post-merger efficiency)

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Merger Cases</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acquiring</td>
<td>Target</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Coef</td>
<td>Prob</td>
<td>Coef</td>
</tr>
<tr>
<td>Constant</td>
<td>0.001</td>
<td>0.59</td>
<td>0.247</td>
</tr>
<tr>
<td>Ln rel assets</td>
<td>0.001</td>
<td>0.02</td>
<td>-0.006</td>
</tr>
<tr>
<td>Ln rel badloan</td>
<td>-0.001</td>
<td>0.61</td>
<td>0.001</td>
</tr>
<tr>
<td>Ln diff branches</td>
<td>0.000</td>
<td>0.60</td>
<td>-0.001</td>
</tr>
<tr>
<td>Ln rel (capital/assets)</td>
<td>-0.007</td>
<td>0.29</td>
<td>0.003</td>
</tr>
<tr>
<td>Ln rel (loan / deposit)</td>
<td>0.011</td>
<td>0.24</td>
<td>0.025</td>
</tr>
<tr>
<td>One comm charter dum</td>
<td>0.016</td>
<td>0.16</td>
<td>0.061</td>
</tr>
<tr>
<td>Both comm charter dum</td>
<td>-0.011</td>
<td>0.65</td>
<td>0.018</td>
</tr>
<tr>
<td>Ln diff SEGs</td>
<td>0.000</td>
<td>0.81</td>
<td>0.003</td>
</tr>
<tr>
<td>Ln diff prior mergers</td>
<td>-0.001</td>
<td>0.39</td>
<td>0.001</td>
</tr>
<tr>
<td>Ln rel (accts / mem)</td>
<td>-0.000</td>
<td>0.97</td>
<td>-0.048</td>
</tr>
<tr>
<td>Ln rel ROA</td>
<td>0.001</td>
<td>0.71</td>
<td>-0.019</td>
</tr>
<tr>
<td>Yr of merger dum</td>
<td>0.030</td>
<td>0.04</td>
<td>0.027</td>
</tr>
<tr>
<td>F-statistic</td>
<td>1.110</td>
<td>0.35</td>
<td>5.242</td>
</tr>
<tr>
<td>Mean dep var</td>
<td>-0.002</td>
<td></td>
<td>0.081</td>
</tr>
<tr>
<td>S.D. dep var</td>
<td>0.056</td>
<td></td>
<td>0.096</td>
</tr>
<tr>
<td>Adj R-squared</td>
<td>0.00</td>
<td></td>
<td>0.14</td>
</tr>
<tr>
<td>Number of obs</td>
<td>348</td>
<td></td>
<td>309</td>
</tr>
</tbody>
</table>
The final regression explains merger success from the perspective of the credit union movement. Pre-merger service performance scores and characteristics are aggregated by calculated member-weighted averages. The data in the previous pair of regressions is modified as follows:

1. The number of observations becomes 337.

2. The dependent variable is adjusted by replacing separate pre-merger performance scores \((\phi_{t-1}^i)\) and \((\phi_{t-1}^j)\) with a single member-weighted average performance score.

3. Member-weighted averages are substituted for all characteristics that were expressed in ratio or difference form.

4. The specifications of the dummy variables are unchanged.

| Table A.C.3 |
| Table A.C.3 The Determinants of Merger Success: The Movement View |
| Dependent Variable = ln (pre-merger mem wt efficiencies/ post-merger efficiency) |
|
| **Independent Variable** | **Merger Cases With Member Weighted Means** |
| --- | --- | --- | --- |
| **Coef** | **Prob** | **Coef** | **Prob** |
| Constant | 0.019 | 0.72 | -0.004 | 0.14 |
| Ln mem wt assets | -0.001 | 0.83 | 0.000 | 0.88 |
| Ln mem wt badloan | -0.027 | 0.02 | 0.001 | 0.09 |
| Ln mem wt branches | 0.000 | 0.001 | 0.56 |
| Ln mem wt (capital/assets) | 0.000 | 0.94 |
| Ln mem wt (loan/ deposit) | 0.000 | 0.90 |
| Ln mem wt SEGs | 0.004 | 0.80 |
| Ln mem wt R.O.A | 0.004 | 0.17 |
| Yr of merger dum | 0.008 | 0.23 |
| F-statistic | 1.13 | 0.33 |
| Mean dep var | 0.007 |
| S.D. dep var | 0.056 |
| Adj R-squared | 0.01 |
| Number of obs | 337 |
Bibliography


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