Focusing versus diversifying bank mergers: analysis of market reaction and long-term performance

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Abstract

This paper explores the paradox of bank mergers: on average, bank mergers do not create value yet they continue to occur. Using cross-sectional analysis to examine 56 bank mergers between 1991 and 1995, I test several facets of focus and diversification. The study finds that upon announcement the market rewards the mergers of partners that focus their activities and geography. Long-term efficiency, however, is enhanced when the merger involves a relatively inefficient acquirer and payment is not made solely with cash. Long-term stock performance is further enhanced when the surviving firm does not engage in cross-subsidization. The study suggests market participants correctly realize that focusing mergers create value, but investors may need to rethink the facets of focus they value.

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1. Introduction

The word paradox is often used to describe bank mergers: on average, they do not create value, yet they continue to occur. Although several studies find that the announcements of bank mergers on average neither create nor destroy stockholder value (for example, see Pilloff and Santomero, 1998), some studies find the announcement of certain types of bank mergers do create value. Houston et al. (1999) find the market reacts positively to announcements of mergers that are predicted to reduce costs. This is consistent with the results of DeLong (2001) who finds mergers that focus along geographic and activity lines – those with the greatest potential for cost savings – create value upon announcement. This study examines two types of hypotheses that suggest how a merger could enhance value. Diversifying hypotheses propose that bank mergers that bring together partners with quite different revenue streams or cost structures will enhance value, while focusing mergers are those where partners are similar in revenue and cost structures. Market reaction to variables representing these hypotheses is then presented along with the long-term performance of the acquirer vis-à-vis these hypotheses. The study finds that focusing mergers enhance value both ex ante and ex post, but upon announcement the market reacts to facets of focusing that are different from those that improve long-term performance.

Recognizing the variables that enhance the value of bank mergers is important for several reasons. First, identifying aspects of mergers that enhance performance assists us in explaining why the phenomena of bank mergers occur in light of the fact that they do not increase firm value on average. Managers wishing to engage in mergers are able to point to a few mergers that do create value as justification for their own attempts. By identifying the elements of bank mergers that do enhance value, this study ascertains whether the managers are justified. That is, are the mergers that the managers propose in fact similar to the few mergers that create value? Second,
similar to the use of value-at-risk models to determine the allocation of risk capital (see Saita, 1999), an understanding of the possible outcomes for a choice of mergers could be useful in evaluating potential merger partners. Finally, by examining the question in terms of focusing versus diversifying hypotheses, I extend the debate between focus versus diversification into the banking industry. Proponents of the focusing hypothesis such as Berger and Ofek (1995) and Lang and Stultz (1994) contend that firms that concentrate their efforts to limited spheres enhance value while firms that go beyond their core areas destroy value. Proponents of the diversifying hypothesis assert that firms that obtain cash flows from various sources enhance value and that concentrating too narrowly on one area is dangerous. (See Hubbard and Palia, 1999, and Stein, 1997.) In the banking industry, proponents of diversification defend universal banking, a system that allows banks to sell and underwrite securities and insurance as well as own commercial firms.

The finding that focusing enhances value agrees with studies that examine conglomerate mergers and the negative effect of diversification in general. Mørck et al. (1990) find that returns to bidders are lower when mergers diversify, Lang and Stulz (1994) find a negative relationship between the Tobin's Q of a firm and its level of diversification, and John and Ofek (1995) observe positive stock reactions upon the announcement of focus-increasing divestitures. These previous studies, however, look only at unregulated industries. I assume that such firms seek to maximize stockholder return and make business decisions in an unfettered environment. If such firms first focus and then choose to diversify, the diversification could stem from non-value-maximizing motives such as risk-averse managers attempting to reduce their “employment risk.” (See Amihud and Lev, 1981.) Banks, however, could be forced to focus as a result of regulation.¹ Perhaps for

¹ Until the repeal of the McFadden Act in 1994, U.S. banks were not permitted to engage in interstate banking except under special circumstances. Only with the repeal of the Glass-Steagall
banks, diversification could be beneficial. That is, the diversification versus focus question remains in banking even after considering the previous work that finds value in focusing.

This study differs from previous work in several ways. By focusing on the banking industry, it not only controls for possible industry effects but also allows the testing of bank-specific hypotheses. For example, the role of geographic overlap is more interesting in service industries such as banking than manufacturing firms since service industries demand proximity to the client. Furthermore, I look not only at returns to acquirers and targets separately, but also at the returns to the acquirer and target combined. Examining combined returns allows us to see the economic value of the merger. That is, I analyze the expected overall contribution of the merger, not just the expected value from the point of view of the acquirer’s or target’s stockholders. Houston and Ryngaert (1994) and Houston et al. (1999) also examine bank-specific hypotheses to explain the variation in returns to combined partners. While they look at geographic overlap, they do not include the activity dimension in their analysis. Finally, the paper looks at the long-run effect of bank mergers on the performance of the surviving firms. Such analysis allows us to see whether market reaction corresponds to long-term performance. This investigation is particularly important since empirical evidence is mixed. Cornett and Tehranian (1992) find a significant correlation between abnormal returns upon announcement and long-term cash flow improvement, yet Pilloff (1996) finds no correlation between abnormal returns upon the announcement of a merger and subsequent performance of the publicly-traded banks he examines.

Stock market reaction upon announcement for the mergers in this study is consistent with the findings of previous studies. (See Houston et al., 1999, and DeLong, 2001.) On average,

Act in 1999 were U.S. commercial banks permitted to engage in investment bank activities except
bidders lose a significant 2.2% upon announcement, targets gain a significant 14.8%, and the combined partners neither create nor destroy value. Mergers that focus both activity and geography are the only ones to create significant value on average for the combined partners.

This study explores the aspects of mergers that the market values upon announcement as well as the elements that improve long-term performance. I find that the market rewards upon announcement partners engaged in focusing mergers with overlapping facilities and penalizes partners of mergers that diversify their activities. Long-term efficiency, however, is enhanced when the merger involves an inefficient acquirer and payment is not made solely with cash. Long-term stock market performance falls when the revenue streams of the partners are diverse.

The study proceeds as follows. The next two sections delineate hypotheses on why diversifying mergers should create value as well as hypotheses on why focusing mergers should do so. Section 4 summarizes the cross-sectional regressions. Data and methodology are outlined in Section 5. Sections 6 and 7 discuss the results. The final section summarizes and concludes.

2. Value enhancement through diversifying

Through diversification, banks could lower costs and thereby increase value in several ways. For example, if mergers create cost synergies such as economies of scope, banks reduce expenses. Also, diversifying mergers could lower the volatility of earnings, thereby lowering the probability and expected costs of bankruptcy as well as the reliance on external funds, which are more expensive than internal funds. This section explores the theoretic foundation and empirical evidence that suggest banks are able to improve value through mergers that diversify.

Independent variables to test each hypothesis are also established.

through very limited subsidiaries.
A. Economies of scope

Economies of scope mean that the joint production of two or more goods is accomplished more cheaply than producing them separately. For example, banks that offer both commercial and investment services to their clients could lower costs and achieve economies of scope if various departments share information, transactions systems, and monitoring costs. (See Saunders and Walter, 1992.)

Diseconomies of scope can also arise. The administrative costs of managing more activities could outweigh the benefits of such diversification. Should any conflicts of interest arise, the repercussions for a firm’s reputation could be quite detrimental. For example, J.P. Morgan, Inc. simultaneously served as commercial banker, investment banker, and adviser to the Spanish Banco Espanol de Credito (Banesto). When Banesto failed and the conflicts of interest were revealed, the value of J.P. Morgan’s stockholder equity fell by 10%. Smith and Walter (1995) describe the conflicts of interest between Morgan and Banesto.

Empirical evidence on the existence of global economies of scope is limited. In his survey of the literature on economies of scope in banking, Clark (1988) finds no consistent evidence. Berger and Humphrey (1992a) evaluate data on the efficient frontier and find scope economies could lower the costs of a commercial bank by 10 to 20%.

To examine whether an acquirer is attempting to take advantage of economies of scope, I look at whether it merges with a firm that has different activities. Previous studies such as Berger and Ofek (1995) define diversification of activity via standard industrial classification (SIC) codes. Such classification cannot be applied to the banking industry since the SIC codes that pertain to banks reflect their regulators and not their activities. The broad category of “Banks” (SIC 6000)
is broken down into “National Commercial Banks” (SIC 6021), “State Banks, Member of Federal Reserve” (SIC 6022), and “State Banks, Insured” (SIC 6023). I must therefore find another way to determine activity diversification. One indication of the similarity or dissimilarity of activity, proposed by Mørck et al. (1990), is the correlation of the stock returns of the merging partners. This measure of diversification is further substantiated by Flannery and James (1984), who show that the market demands a premium on banks that expose themselves to relatively more interest rate risk than other banks. Extending their finding suggests that the market gauges the various types of risk to which a bank exposes itself, including credit, liquidity, and off-balance-sheet risk, and prices each of the uncertainties. Banks whose stock prices move in tandem are therefore exposing themselves to similar risks and are engaged in similar activities. Since I am looking at diversification, I subtract the correlation coefficient from unity:

\[
\text{Activity diversification} = 1 – \text{correlation of stock returns of merging partners.}
\]

To determine whether a merger focuses or diversifies the partners’ activities, I examine the partners’ daily stock returns one year prior to the merger announcement. Similar stock returns indicate that the partners engage in similar activities. If economies of scope enhance value, this proxy should indicate that activity diversifying mergers produce higher abnormal returns and a positive coefficient would result.

\[\text{B. Lower risk of ruin and expected bankruptcy costs}\]

Bankruptcy costs include both the direct costs of legal, accounting, and administrative fees as well as the indirect costs of lower sales, worse terms for purchasing supplies or obtaining credit, reduced employee morale, and other opportunity costs. Altman (1984) finds that total costs
just prior to filing for bankruptcy average 16.7% of the value of an industrial firm, while James (1991) finds that banks lose about 30% of the value of their assets when they fail. Since bankruptcy costs can be high, lowering expected default would be beneficial to a firm. By lowering the volatility of a bank’s value, diversification could reduce the expected risk of failure and thereby reduce the expected costs associated with bankruptcy. Scott (1981) provides an overview of risk of ruin models.

A drawback to stockholders of lowering the probability of bankruptcy is that the value of current debt could increase at the expense of equity holders. This wealth redistribution occurs when cash flows are not perfectly correlated so that bondholders receive payment with greater probability and the market value of the current debt increases. A simple example illustrates.

Suppose Firm 1 has a single project that pays 100 in State A and 0 in State B while Firm 2 has a single project that pays 0 in State A and 100 in State B. Assume further that each firm has debt of 50. If the probability of each state is 50%, the expected value of debt for each firm is 25 since debt holders receive 50 with a probability of 50%. The expected value of equity is also 25 since equity holders receive the residual 50 with a probability of 50%. If these two firms merge, debt now totals 100 and debt holders receive payment regardless of the state and equity holders receive nothing in either state. Israel (1991) presents a model that shows higher debt levels of a potential target result in lower profitability for the acquirer. Billett (1996) tests this theory and finds evidence to support the expectation of a wealth transfer from acquirer and target equity holders to target debt holders. The probability of being acquired is lower for firms with more risky debt than firms with less risky debt outstanding.

A study by Brick et al. (1982) finds that highly leveraged firms that enter into diversifying mergers tend to realize higher abnormal returns upon announcement than firms that do not possess
both of these traits. Furthermore, the abnormal return increases with the leverage of the acquired firm. This study appears to contradict the findings of Billet described in the previous paragraph. One possible reconciliation is that certain firms increase their debt after a merger or retire their old debt and issue new debt at a lower interest rate. Under these circumstances, no transfer of wealth occurs and the acquirer takes advantage of tax benefits from the losses created by the target. While many highly leveraged firms do not provide enough of a tax shield to offset the cost of coinsurance and are therefore less likely to be acquired, the market rewards mergers with targets where the benefits are greater than the costs. That is, only relatively few targets provide tax shield benefits that outweigh the costs of coinsurance, but the market rewards mergers with such targets.

An acquirer seeking to lower its risk of bankruptcy would want to take over a target with relatively less debt than its own. The difference between the debt-equity ratios of the merging partners indicates whether a target brings relatively more or less debt to the merged entity. The variable examined therefore compares the debt-equity ratios in the following manner:

\[ \text{Difference in debt-equity ratios} = \text{debt-equity (acquirer) – debt-equity (target)}. \]

Reducing the probability of bankruptcy could influence stock returns in different ways. If the market desires a lowering of expected and real bankruptcy costs, the coefficient on this variable should be positive. If stockholders are concerned that lowering the risk of bankruptcy will transfer their wealth to target debt holders, the coefficient should be negative.
C. Less reliance on external funds

By lowering the volatility of cash flows, diversifying mergers could help overcome capital market imperfections. The smoothing of earnings could reduce the need for external funds, which are more expensive than internal ones for several reasons including transaction costs and asymmetric information between the borrower and the lender. Santomero (1995) discusses the underinvestment problem banks face when they try to obtain external funds and shows banks must sometimes forego projects with positive net present values when such projects provide no benefit to equity holders. The more volatile the earnings, the more often the bank must seek external financing so the more often the bank may forego certain projects that would create value. Houston et al. (1997) find a negative relationship between use of external funds and loan growth in bank holding companies. Smoother earnings therefore allow a bank to use internal financing more often and thereby increase value by engaging in more projects with positive net present values.

There is, however, a drawback to lowering the volatility of earnings. Firms that do not have to seek external funds also do not have external oversight. The diversified firms could use healthy segments to assist those making losses. Meyer et al. (1992) discuss how a stand-alone firm would not be able to operate with a negative cash flow for very long whereas an ailing business segment could be subsidized by healthier ones in the same corporation. Scharfstein and Stein (2000) show how such cross-subsidization can create inefficient investment spending.

To test whether a potential reduction in the volatility of earnings affects market reaction, I look at the ratio of the weighted average of the partners’ volatilities of earnings with the volatility of the earnings as if the two partners had been merged:
Relative volatility of earnings

\[ \sigma_{ROE} \text{ (weighted average of partners)} / \sigma_{ROE} \text{ (hypothetically merged entity)}. \]

Volatility is defined as the standard deviation of the earnings and is measured using annual data over the five years before the merger is announced. If a firm could lower the volatility of its earnings, it could lower its need for external funds. The higher this variable, the greater is the potential reduction in earnings volatility. If reducing the reliance on external funds is important for merging firms, the coefficient on this variable should be positive.

3. Value enhancement through focusing

This section discusses the theoretic aspects and empirical evidence concerning reasons for value-maximizing banks to engage in mergers that focus. Focusing mergers can take advantage of operating synergies such as lower overhead costs or greater managerial efficiency as well as create value through economies of scale or reduced overinvestment. Each segment concludes with an independent variable that reflects the hypothesis.

A. Reduced overhead

Geographically focusing mergers could reduce overhead costs by allowing banks to close overlapping branches and facilities. Houston and Ryngaert (1994) and DeLong (2001) find that the market reacts positively to mergers with geographic overlap. Houston et al. (1999) find that geographic overlap is positively related to the estimated present value of mergers as well as estimated cost savings. Cornett and Tehranian (1992) find that improvement in long-term performance is greater for intrastate rather than interstate bank mergers.
To test this hypothesis, I include a variable for geographic focus. Studies that examine geographic overlap such as Cornett and Tehranian (1992) and DeLong (2001) define geographic focus with a dummy variable that is one when both merging partners are headquartered in the same U.S. state. While this provides a rough measure of potential overlap, Houston and Ryngaert (1994) introduce a more refined statistic. They look at the locations of all branches of all subsidiaries of the merging bank holding companies. If both partners have branches in the same town, Houston and Ryngaert assume that the merged entity would close the lower number of branches. For example, if the acquirer has 4 branches in the same town and the target has 6, Houston and Ryngaert assume the merged entity would close 4 of the 10 (4+6) branches. They add together the total number of overlapping firms and scale the number by the total number of existing branches to create a statistic that ranges between 0 and 0.5. This statistic captures important aspects that the intra- versus interstate dummy variable does not. Specifically, if two partners are located in different parts of the state, the intra- versus interstate classification would incorrectly define the merger as geographically focusing. Moreover, the intra- versus interstate measure looks only at the headquarters of the bank holding company. The Houston-Ryngaert measure takes into consideration all subsidiaries of the merging banks or bank holding companies. Finally, the Houston-Ryngaert measure reflects the degree of overlap more accurately. If three out of ten branches could be closed, the measure of geographic overlap is much higher than if three branches out of 100 could be closed. One drawback to the Houston-Ryngaert statistic is that two banks with offices in neighboring cities would not appear to have overlapping facilities. Since such offices could include back office and other processing units, overlap and subsequent closings are possible.
The measure I use is a modified version of the Houston-Ryngaert statistic. I obtain the county of the headquarters and number of branches of each subsidiary of each bank or bank holding company in the study. If the two partners are headquartered in the same county, I assume – as do Houston and Ryngaert – that the minimum number of offices of the two will be closed. If the partners are headquartered in neighboring counties, I assume that half of the minimum could be closed. My statistic is the following and ranges from 0 to 0.5:

\[
\text{Geographic overlap} = \frac{\sum_{i=1}^{n} \min(A_i, T_i) + \frac{1}{2} \sum_{j=1}^{m} \min(A_j, T_j)}{\sum_{k=1}^{n+m+p} (A_k, T_k)}
\]

where A is the number of branches for the acquirer, T is the number of branches for the target, n mergers have partners headquartered in the same county and m mergers have partners headquartered in neighboring counties. The total number of counties where only one partner has offices is p.

According to the reduced overhead hypothesis, mergers within the same geographic area should reduce costs more than market expanding mergers. Mergers that could close a higher percentage of branches have more potential cost savings. If the hypothesis holds, the coefficient on the geographically focusing measure should be positive.

**B. Improved efficiency**

Focusing mergers could improve efficiencies through the transfer of skills. Jensen and Ruback (1983) suggest that a merger is a good mechanism to replace inefficient managers with efficient ones. Jensen (1986) contends that an effective replacement can only occur within the same industry since managerial skills are not transferable between industries. Berger and
Humphrey (1992b) find that acquiring banks tend to be significantly more efficient than the acquired banks suggesting that the acquirer may potentially improve the efficiency of the target. A measure to gauge the efficiency of a firm is its efficiency ratio, namely its non-interest expenses to total revenue. The more efficient a firm, the lower this ratio. I therefore compare the efficiency ratio of the target with that of the acquirer:

\[
\text{Difference in efficiency ratios} = \\
\frac{\text{non-interest expenses}}{\text{total revenue (target)}} - \\
\frac{\text{non-interest expenses}}{\text{total revenue (acquirer)}}.
\]

According to the improved efficiency hypothesis, mergers where the acquirer is more efficient than the target have a higher potential for improving efficiency. The larger is the difference in efficiency ratios, the higher should be abnormal returns to the merging partners.

In separate regressions, I test the low-efficiency hypothesis presented by Akhavein et al. (1997). The low-efficiency hypothesis posits that acquiring banks use mergers as an excuse to improve efficiency within their current organizations. The firms that benefit most from mergers are therefore those that are least efficient at the outset. I test this hypothesis by examining the efficiency ratios of the acquirers and targets separately. If the low-efficiency hypothesis holds, the coefficient on either the acquirer’s efficiency ratio or the target’s ratio, or both, should be positive since a higher ratio indicates a less efficient bank.

C. Economies of scale

Bank owners and managers often cite scale economies as an argument to justify mergers. They claim they are able to reduce average costs by expanding the volume of similar output. A
downside to expanded operations is diseconomies of scale that could arise from increased bureaucratic and within-firm transaction costs.

Empirical analysis on economies of scale in banks is mixed. Although some studies of bank scale economies (see Berger and Humphrey, 1993, for an overview) find small economies of scale in banking, such studies have methodological flaws. They tend to use the Cobb-Douglas cost function that restricts average costs to be increasing, decreasing, or constant for all banks and does not allow differently-sized banks to enjoy different average cost structures. Other academic studies (for surveys, see Clark, 1988, and Berger et al., 1993) use the translog cost function and find the relationship between size and average cost to be U-shaped. This suggests that small banks can benefit from economies of scale, but that large banks seem to suffer from diseconomies of scale, resulting in higher average costs as they increase in size. Hughes et al. (1999), however, find that as long as banks diversify macroeconomic risk, they can improve efficiency and reduce insolvency risk by merging.

If the economies of scale argument holds, then the larger the presence of the target in the merger entity, the greater should be the benefit of a merger. I therefore include the relative size of the target:

\[
\ln \text{(relative market values)} = \ln \left\{ \frac{\text{equity market value of target}}{\text{equity market value of acquirer} + \text{target}} \right\}.
\]

The larger the target vis-à-vis the hypothetically merged entity, the higher is this number and the greater is the potential for economies of scale from the merger. The economies of scale argument suggests that the coefficient should be positive.
D. Reduced overinvestment

Overinvestment occurs when managers make capital investments in projects that do not have expected positive net present values. Focusing mergers could restore value by reducing overinvestment.

Managers may choose to overinvest for several reasons. They may want to expand the size of their organizations since managerial compensation is positively related to firm size. They may also want to diversify their “employment risk,” that is, the risk of losing their professional reputations or jobs if the firm for which they are working has low earnings or enters bankruptcy. By engaging in diversifying projects, the managers can learn a variety of transferable skills. This occurs even if such projects do not benefit stockholders. Amihud and Lev (1981) suggest that conglomerate mergers reduce the cash flow variance of a firm and therefore increase the security of the managers’ jobs. In his cash flow theory, Jensen (1986) posits that managers with more cash than they need may engage in value-destroying diversification through overinvestment. When managers have access to free cash flow, defined as cash in excess of that needed for operations and positive net-present-value projects, they may choose not to return the cash to shareholders in the form of increased dividends. Instead, they invest in projects that do not necessarily have expected positive net present values such as diversifying mergers.

To indicate whether there could be an overinvestment problem, I include a dummy variable that is one when the acquirer uses cash to buy the target:

\[ Cash = 1 \text{ when method of payment is cash and 0 otherwise.} \]

If free cash flow is a problem, I expect the coefficient on this variable to be negative.
4. Summary of the cross-sectional regression

In addition to the diversifying and focusing hypotheses to be tested, I include another variable to control for the method of payment. Payment in stock could indicate that the acquirer’s stock is overvalued, but targets may prefer to be paid in stock since cash payment creates an immediate tax liability whereas payments in stock are taxable only when they are sold. The empirical evidence is mixed. Amihud et al. (1990) show that acquirers paying for the mergers in cash earn significantly more than acquirers who use stock, while Houston and Ryngaert (1994) find payment in stock is valued by investors. DeLong (2001), however, finds method of payment does not influence returns to combined partners.

Since method of payment could influence results, I include a dummy variable to control for payment in stock:

\[ \text{Stock} = 1 \text{ when method of payment is stock and 0 otherwise}. \]

The inclusion of dummy variables for both cash and stock do not overspecify the regressions since six acquirers used a combination of cash and stock to purchase their targets.

The final cross-sectional regression of announcement effects follows. In Section 7, various measures of long-term performance replace CAR as the dependent variable.

\[ \text{CAR}_i = \alpha + \beta_1 \times (1 - \text{correlation coefficient of partners}) \text{ to show economies of scope} + \beta_2 \times \text{Difference in debt-equity ratios (acquirer – target) to show lowering of bankruptcy} + \beta_3 \times \text{Relative volatilities of earnings to show reduced reliance on external funds} + \beta_4 \times \text{Geographic focus to show reduced overhead} + \beta_5 \times \text{Difference in efficiency ratios (target – acquirer) to show improved efficiency} + \beta_6 \times \text{Relative market size of target to show economies of scale} \]
+ \beta_7 \cdot \text{Cash dummy variable to show reduced overinvestment and}

+ \beta_8 \cdot \text{Stock dummy variable to control for payment in stock.} \quad (1)

If the value of merger partners is enhanced through diversification, \( \beta_1 \) to \( \beta_3 \) should be positive. If focusing enhances value, \( \beta_4 \) to \( \beta_6 \) should be positive and \( \beta_7 \) should be negative.

5. Date and methodology

This section looks at the data and methodology used to test the above hypotheses. The sample consists of completed U.S. mergers where at least one partner is a banking organization. Both partners must be publicly-traded to obtain the necessary stock data. Only completed mergers are used so that long-term performance can be evaluated in Section 7. The list of mergers comes from the Securities Data Company. Of the 528 completed mergers between publicly-traded partners announced from 1991 to 1995, I am able to use 56. Reasons for excluding a particular merger include involving a non-U.S. partner (125), daily stock data not available (111), less than one year of daily stock data prior to the merger announcement (108), less than three years of data after the merger (27), and accounting data not available (101). I regress the cumulative abnormal returns to the total stockholders (acquirer and target) for ten days before to one day after a merger announcement on the independent variables that correspond to the hypotheses detailed in Sections 2 and 3. To obtain the abnormal returns, I use the standard event study methodology of Brown and Warner (1985) with the market model:

\[
AR_i = R_i - (\alpha_i + \beta_i R_{M_i})
\]  

(2)
where \( \text{AR}_{it} \) is abnormal return for stock \( i \) at time \( t \), \( R_{it} \) is return on stock \( i \) at time \( t \), and \( R_{Mt} \) is the return on the market at time \( t \). The intercept and slope, alpha and beta, are estimated using daily returns 300 to 51 days before the merger announcement. The market return is the value-weighted index of returns (including dividends) for the combined New York Stock Exchange, American Stock Exchange, and NASDAQ from Center for Research in Security Prices (CRSP).

I examine the abnormal returns to both bidder and target by constructing a hypothetical portfolio of the two merging partners and determining the daily changes in the sum of their market values:

\[
R_{it} = \ln\left(\frac{MV_A^t + MV_T^t}{MV_A^{t-1} + MV_T^{t-1}}\right)
\]

where \( R_{it} \) is the return to the combined partners for merger \( i \) at time \( t \), and \( MV_{A(T)}^t \) is the market value of acquirer (target) at time \( t \). Most studies that look at combined acquirers and targets take a weighted average of each partner’s percentage returns, using a fixed weight set before the event window. (See, for example, Bradley et al., 1988.) Such methodology, however, could misrepresent the percentage by which the value of the combined acquirer and target changes since a percentage increase is not equal to a percentage decrease. For example, assume two partners are equally weighted based on assets and the market value of one increases from 5 to 6, or 20%, and the market value of the other decreases from 6 to 5, or –16.7%. The portfolio calculated using fixed weights shows an increase of 1.65% (= 0.5*20% + 0.5*-16.5%), even though the market value of the portfolio has not changed (5+6=6+5). Following DeLong (2001), the hypothetical portfolios I examine in this study
allows the relative weight of the each partner to change and thereby directly reflects the change
in the portfolio’s value. Acquirers and targets are also examined separately. Since relative
weights are not a problem with individual firms, I calculate the returns for the separate partners
and compare prices at time \( t \) with those at \( t-1 \).

Market data come from the Center for Research in Stock Prices (CRSP), and accounting
data come from the Y-9 data available on the World Wide Web from the Chicago Federal
Reserve Bank. Data on the headquarters and number of branches of each bank subsidiary come
from the Federal Deposit Insurance Corporation (FDIC) database. Method of payment data
come from the Securities Data Company mergers and acquisitions database.

6. Results of announcement reactions

Table I shows the cumulative abnormal returns (CARs) for the announcements of the 56
bank mergers examined in this study. On average, acquirers lose a significant 2.2%, targets gain
a significant 14.8%, and the combined partners neither create nor destroy value. Following
DeLong (2001), I divide the sample into four groups according to geographic and activity focus or
diversification. I follow the methodology of Mørck et al. (1990) to determine activity focus or
diversification. Specifically, when the correlation coefficient of stock returns in the year before
the merger is announced for the merging partners is above the median of the group, the merger is
classified as activity focusing. Merging partners whose correlation coefficient is below the
median are considered to be diversifying their activities. Geographic overlap is determined using a
modification of Houston and Ryngeart’s (1994) methodology discussed in Section 3A. When the
measure for geographic overlap is greater than the median for the group, the merger is considered
to be geographically focusing. The table shows that mergers that focus both activity and
geography are the only ones to create significant value on average for the combined partners.

Table II shows the results of the cross-sectional analyses of announcement reactions to
the combined partners as well as acquirers and targets. The dependent variable in the first three
regressions is the CAR for the combined partners. The regressions show that the market reacts
negatively to the announcements of mergers that diversify their activities so the market seems to
expect a merger to create diseconomies of scope. The market reacts positively to mergers with
overlapping facilities, suggesting that the market expects benefits such as reduced costs from
geographically focusing mergers. Another interpretation of this result, however, is that such
mergers could be expected to take advantage of market power. By focusing on a particular
market, merging banks could take advantage of monopolistic or oligopolistic rents. Market power
allows banks to charge more or pay less for the same service (e.g. higher loan rates or smaller
deposit rates) than they would in a competitive environment. Although studies find that banks in
concentrated markets tend to charge higher interest rates or pay lower deposit rates than banks in
less concentrated markets, antitrust policy seems to prevent banks that merge from taking
advantage of their increased market power. Berger and Hannan (1997) find that loan rates are
higher and deposit rates are lower when banks operate in concentrated markets. These increased
revenues, however, do not result in higher profits. The study also shows evidence consistent with
managers pursing "quiet lives" and incurring higher costs than their counterparts in less
concentrated markets. Akhavein et al. (1997) find that banks that merge charge more for loans
and pay less on deposits before they merge than other large banks. After the merger, however,
this difference falls; merging banks, therefore, do not tend to take advantage of their increased
market power. The authors contend that antitrust policy is effective in preventing mergers that
would create market power problems. Siems (1996) reaches a similar conclusion. He finds no relationship between the abnormal returns and the change in the Herfindahl-Hirschman Index that measures market concentration.

Increased market power could reveal itself in higher interest rates on loans or lower rates paid on deposits. A measure that captures both of these effects is the net interest margin (NIM = interest income less interest expense) standardized by total earning assets (TEA). I compare the NIM/TEA of the acquirer with that of the target in the calendar year prior to the merger announcement. Since the market power argument would hold only if banks are located in the same geographic area, I multiply the result by the measure for geographic overlap:

\[
\text{Market power indicator} = \left( \frac{\text{Net interest margin}}{\text{Total earning assets}} \right)_{\text{(acquirer)}} - \left( \frac{\text{Net interest margin}}{\text{Total earning assets}} \right)_{\text{(target)}} \times \text{Geographic overlap}
\]

If the increased market power hypothesis holds, the coefficient on this variable should be positive. The acquirer is increasing its presence in a market that already allows it to take advantage of its market power, and the inputs employed by the target should produce higher returns.

Regression 3 in Table II shows that the coefficient on this variable is indistinguishable from zero for the combined partners. Market power, then, does not explain the positive reaction to overlapping facilities.

Regressions 4, 5, and 6 of Table II analyze the CARs of acquirers. Upon announcement, investors in acquiring firms react positively to geographic overlap, suggesting that such investors expect reduced costs for the merged entity. As with the combined partners, the positive reaction to market overlap cannot be explained by market power since the coefficient on the market power
variable is negligible in regression 6. Investors discount mergers that could reduce earnings volatility. They could be concerned that such mergers will increase inefficient cross-subsidization.

Regressions 7, 8, and 9 of Table II look at announcement returns to targets. Investors in targets react negatively when the partners diversify activities. Perhaps they are concerned that the merger will not be approved by the acquirer’s stockholders if the partners are diversifying their activities.

7. Long-term performance

The above analysis looks at various hypotheses and how they relate to the market’s reaction to a bank merger upon announcement. How do these variables relate to the long-term performance of the merged entity? To explore this question, I replace CAR as the dependent variable in the above regressions with several measures of long-term performance. The first three regressions in Table III analyze the change in merging partners’ efficiency ratio (non-interest expense to total revenue) one year prior to the merger announcement with the surviving firm’s efficiency ratio three years after the merger is effective. The independent variables remain the same. It is important to examine at least three years after a merger is effective in order to determine the effect of the merger. Berger et al. (1998) find that changes stemming from mergers can take up to three years to become operative. To remove the industry effect, I adjust the efficiency ratio by subtracting the industry average ratio for each particular year in question. For example, if a merger is announced in 1991 and effective in 1992, I compare the efficiency ratio in 1995 with that of 1990. I reduce the 1990 efficiency ratio for the weighted average of the partners by the average bank ratio for that year. For the 1995 figure, I reduce the efficiency ratio of the resulting entity by the average bank ratio for that year. Regressions 4, 5,
and 6 analyze the change in industry-adjusted return on assets from one year before the merger is announced to three years after the merger is effective. Regressions 7, 8, and 9 have as the dependent variable the long-term stock returns defined as the return on the acquirer less the U.S. bank index (from the Datastream database) for three years after the merger is effective.

The most interesting finding in Table III is the importance of the acquirer’s inefficiency. The significant negative coefficient on the difference in efficiency ratios in regression 1 suggests that when the acquirer is less efficient than the target, long-term efficiency improves. Looking at the efficiency ratios for the acquirer and target individually (regression 2) shows that a less efficient acquirer leads to a greater improvement in long-term efficiency. This result is further substantiated in regression 5 that analyzes improvements in return on assets. This finding is consistent with the low-efficiency hypothesis proposed by Akhavein et al. (1997). Mergers that perform better in the long-run involve acquirers that start out as less efficient. Mergers could be an excuse for making tough managerial decisions such as departmental closings that improve the overall performance of the bank.

Table III also shows that a potential reduction in volatility of return on equity has a negative influence on long-term performance. A reduction in volatility could allow stronger departments to subsidize weaker ones. This inefficient cross-subsidization could be the reason for the lowered return on assets shown in regression 5. This lowered volatility could also be transferring wealth from stockholders to bondholders since the lower the volatility of earnings, the less likely is bankruptcy. Since bondholders receive payment in more states of the world, the value of their bonds increases. If the value of the firms does not increase, this wealth increase for bondholders comes at the expense of the stockholders. This transfer of wealth could explain the
negative relationship between long-term value of equity and volatility reduction shown in regressions 7, 8, and 9.

8. Summary and conclusions

The results show that long-term performance is enhanced when mergers involve inefficient acquirers, earnings streams are not diversified, and payment is not made solely in cash. Upon announcement, however, the market reacts positively to mergers that focus both activities and geography. Although the long-term benefits accrue to mergers that focus managerial efficiency and revenue streams as well as reduce overinvestment, the market reacts to more tangible aspects of focusing, namely activity and geography. The market seems to understand that focusing is beneficial, yet it does not seem to know what aspects of focusing are worthwhile.

One reason the market may not be able to predict the long-term performance of mergers is that outcomes are extremely difficult to forecast. A merger is not merely combination of two balance sheets, but also involves dynamic changes. Berger et al. (1998) examine the static effect of combining balance sheets as well as dynamic effects that result in changes in lending practices. Banks often engage in restructuring after they merge (the restructuring effect). The merged entity may divest some assets to reduce excess capacity and therefore be smaller than the static effect creates. The direct effect captures differences between a merged bank and the activities of a similar bank that has not recently merged. Finally, the external effect examines the reaction of competitors. Of the four effects, the static one is the easiest to predict since the information is widely available at least for publicly-traded firms. In this study, the static effect corresponds to the most obvious characteristics of the merging partners. Specifically, investors can easily observe geographic and activity overlap. The dynamic effects are much more difficult to gauge,
and merged firms vary greatly in their abilities to institute the such changes. The market may not have much faith in an inefficient acquirer instituting necessary changes to improve the merged entity even though our study shows that such acquirers tend to bring about the greatest improvement. An interesting extension of this study would be to determine the influence of each of the effects on long-term performance and to test whether the abnormal returns upon announcement are associated with a particular effect.
References


Houston, J. F., James, C., Ryngaert, M., 1999. Where do merger gains come from? Bank mergers from the perspective of insiders and outsiders, manuscript (University of Florida).


Table I. Cumulative abnormal returns to stockholders upon announcement of a U.S. bank merger

The sample consists of 56 domestic U.S. mergers announced between 1991 and 1995 between publicly-traded firms where at least one is a banking firm. The sample is divided into four groups according to geographic and activity focus or diversification. I follow the methodology of Mørck et al. (1990) to determine activity focus or diversification. Specifically, when the correlation coefficient of stock returns in the year before the merger is announced for the merging partners is above the median of the group, the merger is classified as activity focusing. Merging partners whose correlation coefficient is below the median are considered to be diversifying their activities. Geographic overlap is determined using a modification of Houston and Ryngeart’s (1994) methodology. Specifically, the geographic overlap variable I use looks at the counties where the merging partners have headquartered subsidiaries. If both partners have headquarters in the same county, I assume that the merged entity would close the lower number of facilities. If the partners have headquarters in neighboring counties, I assume that half of the overlapping facilities would be closed. I standardize this variable by the total number of offices of each partner:

\[
Geographic\ overlap = \frac{\sum_{i=1}^{n} \min(A_i, T_i) + 1/2 \sum_{j=1}^{m} \min(A_j, T_j)}{\sum_{k=1}^{n+m+p} (A_k, T_k)}
\]

where \(A\) is the number of branches for the acquirer, \(T\) is the number of branches for the target, \(n\) mergers have partners headquartered in the same county and \(m\) mergers have partners headquartered in neighboring counties. The total number of counties where only one partner has offices is \(p\). When the measure for geographic overlap is greater than the median for the group, the merger is considered to be geographically focusing.

Returns for the combined partners (Panel A) are determined by comparing total market value of the two firms at time \(t\) with total market value at \(t-1\): \(R_i = \ln[(MV_{it} + MV_{jt}) / (MV_{i,t-1} + MV_{j,t-1})]\). Returns for bidders and targets (Panels B and C) compare prices in period \(t\) with those in period \(t-1\). Abnormal returns are calculated using standard event study methodology (see Brown and Warner, 1985) with the market model. CARs (\(t=-10,1\)) are averaged for each group. Z-scores are calculated according to Dodd-Warner (1983) and are distributed unit normal under the null hypothesis of no abnormal returns as a result of the merger announcement.
Table I. Cumulative abnormal returns to stockholders upon announcement of a U.S. bank merger (continued)

<table>
<thead>
<tr>
<th>Merger type</th>
<th>No. of mergers</th>
<th>Panel A: Combined</th>
<th></th>
<th>Panel B: Bidder</th>
<th></th>
<th>Panel C: Target</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CAR (%)</td>
<td>z-score</td>
<td>CAR (%)</td>
<td>z-score</td>
<td>CAR (%)</td>
<td>z-score</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>0.77%</td>
<td>1.24</td>
<td>-2.15%</td>
<td>-3.46</td>
<td>14.76%</td>
<td>15.79</td>
</tr>
<tr>
<td>Geographic and activity diversification</td>
<td>14</td>
<td>-0.37</td>
<td>-0.13</td>
<td>-1.16</td>
<td>-0.74</td>
<td>11.62</td>
<td>7.93</td>
</tr>
<tr>
<td>Geographic and activity focus</td>
<td>14</td>
<td>6.23&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.56</td>
<td>2.21</td>
<td>1.62</td>
<td>15.83&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.17</td>
</tr>
<tr>
<td>Geographic focus / activity diversification</td>
<td>14</td>
<td>-1.30</td>
<td>-0.76</td>
<td>-4.04&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-3.15</td>
<td>10.58&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.30</td>
</tr>
<tr>
<td>Geographic diversification /activity focus</td>
<td>14</td>
<td>-1.50</td>
<td>-1.46</td>
<td>-5.58&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-4.64</td>
<td>21.01&lt;sup&gt;a&lt;/sup&gt;</td>
<td>10.21</td>
</tr>
</tbody>
</table>

<sup>a</sup>, <sup>b</sup>, <sup>c</sup> indicate statistical significance at the 1%, 5%, and 10% levels.
Table II. Analysis of factors associated with stock market reaction to the announcement of a U.S. bank merger

The sample consists of 56 U.S. mergers announced between 1991 and 1995 between publicly-traded firms where at least one is a banking firm. The table shows coefficient estimates and t-statistics (in parentheses) for each model. The dependent variable is CAR, the cumulative abnormal return for the combined bidder and target from 10 days before to 1 day after the merger announcement. Returns to the combined merger partners are determined by comparing total market value of the two firms at time t with total market value at t-1: \[ R_t = \ln\left(\frac{MV_{tB} + MV_{tT}}{MV_{t-1B} + MV_{t-1T}}\right) \]. Abnormal returns are calculated using standard event study methodology (see Brown and Warner, 1985) with the market model.

Independent variables are defined as follows. Activity diversification is defined as one minus the correlation coefficient of the partners’ stock returns during the year before the merger is announced. The difference in debt-equity ratios is the debt-equity ratio of the target minus the debt-equity of the acquirer in the calendar year before the merger is announced. Relative earnings’ volatilities are the standard deviation of the weighted average of bidder and target return on equity for the five calendar years before the merger is announced divided by the standard deviation of the return on equity of hypothetically merged partners. The geographic focus variable is:

\[ \text{Focus}_{ij} = \frac{\sum_{k=1}^{n+m+p} (A_k, T_k)}{\sum_{j=1}^{m} \min(A_j, T_j) + 1/2 \sum_{j=1}^{m} \min(A_j, T_j)} \]

where A is the number of branches for the acquirer, T is the number of branches for the target, n mergers have partners headquartered in the same county and m mergers have partners headquartered in neighboring counties. The total number of counties where only one partner has offices is p. The difference in efficiency ratios is the non-interest expense to total revenue for the target in the calendar year before the merger is announced less the same ratio for the acquirer. The relative market values examine the market value of the target at the end of the calendar year before the merger is announced divided by the market value of the target plus acquirer.

I control for heteroskedasticity in all regressions using White’s (1980) method.
Table II. Analysis of factors associated with stock market reaction to the announcement of a U.S. bank merger (continued)

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variable</th>
<th>Combined partners</th>
<th>Acquirers</th>
<th>Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(1) (2) (3) (4) (5) (6) (7) (8) (9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Constant</td>
<td>0.1524(^b) (2.05)</td>
<td>0.1527(^b) (2.05)</td>
<td>0.1874(^a) (2.61)</td>
</tr>
<tr>
<td></td>
<td>Diversifying reasons to merge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economies of scope</td>
<td>-0.1390(^b) (-1.81)</td>
<td>-0.1405(^b) (-1.81)</td>
<td>-0.1695(^a) (-2.17)</td>
</tr>
<tr>
<td></td>
<td>Reduced bankruptcy costs</td>
<td>0.0077 (0.69)</td>
<td>0.0006 (0.49)</td>
<td>0.0008 (0.68)</td>
</tr>
<tr>
<td></td>
<td>Reduced reliance on external funds</td>
<td>-0.0248 (-1.55)</td>
<td>-0.0243 (-1.55)</td>
<td>-0.0224 (1.49)</td>
</tr>
<tr>
<td></td>
<td>Focusing reasons to merge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduced overhead</td>
<td>0.1490(^c) (1.78)</td>
<td>0.1525(^c) (1.83)</td>
<td>0.2187(^b) (2.17)</td>
</tr>
<tr>
<td></td>
<td>Market power</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Net interest income &amp; geographic overlap</td>
<td>-0.2579 (-0.41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improved efficiency</td>
<td>-0.0846 (-1.25)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Efficiency ratio (acquirer), industry-adjusted</td>
<td>0.0369 (0.27)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Efficiency ratio (target), industry-adjusted</td>
<td>-0.1165 (-1.28)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economies of scale</td>
<td>0.0084 (0.96)</td>
<td>0.0079 (0.90)</td>
<td>0.0119 (1.37)</td>
</tr>
<tr>
<td></td>
<td>Reduced overinvestment</td>
<td>-0.0122 (-0.17)</td>
<td>-0.0173 (-0.24)</td>
<td>-0.0000 (-0.00)</td>
</tr>
<tr>
<td></td>
<td>Control variable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Method of payment</td>
<td>0.0132 (0.56)</td>
<td>0.0134 (0.57)</td>
<td>0.0187 (0.64)</td>
</tr>
<tr>
<td></td>
<td>Statistics</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>R(^2)</td>
<td>37.41%</td>
<td>37.61%</td>
<td>34.74%</td>
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<tr>
<td></td>
<td>F-value</td>
<td>3.51(^a)</td>
<td>3.08(^a)</td>
<td>3.13(^a)</td>
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<tr>
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<td># of observations</td>
<td>56</td>
<td>56</td>
<td>56</td>
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</table>

\(^a\), \(^b\), \(^c\) indicate statistical significance at the 1%, 5%, and 10% levels.
Table III. Factors associated with the long-term performance of merged U.S. banks

The sample consists of 56 U.S. mergers announced between 1991 and 1995 between publicly-traded firms where at least one is a banking firm. The table shows coefficient estimates and t-statistics (in parentheses) for each model. The dependent variables are the following: Improved efficiency is the industry-adjusted efficiency ratio (non-interest expense / total revenue) of the merging partners in the calendar year before the merger is announced less the industry-adjusted efficiency ratio of the acquirer three years after the merger takes place. Improved ROA is the industry-adjusted return on assets three years after the merger is effective less the weighted average of the industry-adjusted return on assets of the partners in the calendar year before the merger is announced. Long-term stock returns are the returns to the acquirers for the three years after the merger takes place less the bank industry returns. Independent variables are defined as follows. Activity diversification is defined as one minus the correlation coefficient of the partners’ stock returns during the year before the merger is announced. The difference in debt-equity ratios is the debt-equity ratio of the target minus the debt-equity of the acquirer in the calendar year before the merger is announced. Relative earnings’ volatilities are the standard deviation of the weighted average of bidder and target return on equity for the five calendar years before the merger is announced divided by the standard deviation of the return on equity of hypothetically merged partners.

The geographic focus variable is:

$$\left( \sum_{i=1}^{n} \min(A_i, T_i) + \frac{1}{2} \sum_{j=1}^{m} \min(A_j, T_j) \right) / \sum_{k=1}^{n+m+p} (A_k, T_k)$$

where A is the number of branches for the acquirer, T is the number of branches for the target, n mergers have partners headquartered in the same county and m mergers have partners headquartered in neighboring counties. The total number of counties where only one partner has offices is p. The difference in efficiency ratios is the non-interest expense to total revenue for the target in the calendar year before the merger is announced less the same ratio for the acquirer. The relative market values examine the market value of the target at the end of the calendar year before the merger is announced divided by the market value of the target plus acquirer.

I control for heteroskedasticity in all regressions using White’s (1980) method.
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Variable</th>
<th>Improved efficiency</th>
<th>Improved ROA</th>
<th>Long-term stock returns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Constant</td>
<td></td>
<td>0.0383</td>
<td>0.0362</td>
<td>0.0256</td>
</tr>
<tr>
<td>(0.95)</td>
<td>(1.03)</td>
<td>(0.88)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversifying reasons to merge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economies of scope</td>
<td>1 – correlation coefficient of stock returns</td>
<td>-0.0160</td>
<td>-0.0053</td>
<td>-0.0082</td>
</tr>
<tr>
<td></td>
<td>(0.44)</td>
<td>(-0.14)</td>
<td>(-0.25)</td>
<td>(-0.93)</td>
</tr>
<tr>
<td>Reduced bankruptcy costs</td>
<td>Difference in debt-equity ratios (target – acquirer)</td>
<td>-0.0013</td>
<td>0.0001</td>
<td>-0.0013</td>
</tr>
<tr>
<td></td>
<td>(0.04)</td>
<td>(0.17)</td>
<td>(-1.14)</td>
<td>(-1.31)</td>
</tr>
<tr>
<td>Reduced reliance on external funds</td>
<td>Relative volatilities of earnings</td>
<td>0.0117</td>
<td>0.0084</td>
<td>0.0110</td>
</tr>
<tr>
<td></td>
<td>(0.97)</td>
<td>(1.25)</td>
<td>(0.91)</td>
<td>(-1.44)</td>
</tr>
<tr>
<td>Focusing reasons to merge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced overhead</td>
<td>Geographic overlap</td>
<td>-0.0462</td>
<td>-0.0714</td>
<td>-0.0008</td>
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<tr>
<td></td>
<td>(0.77)</td>
<td>(-1.23)</td>
<td></td>
<td>(-0.19)</td>
</tr>
<tr>
<td>Market power</td>
<td>Net interest margin &amp; geographic overlap</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td>0.0226</td>
<td></td>
<td>0.0055</td>
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<tr>
<td></td>
<td>(0.12)</td>
<td></td>
<td></td>
<td>(0.31)</td>
</tr>
<tr>
<td>Improved efficiency</td>
<td>Difference in efficiency ratios (target – acquirer)</td>
<td>-0.1427</td>
<td>0.0054</td>
<td>-0.0054</td>
</tr>
<tr>
<td></td>
<td>(0.23)</td>
<td>(-1.23)</td>
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<td>(-1.14)</td>
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<td>Efficiency ratio (acquirer), industry-adjusted</td>
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<td>0.4893</td>
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<tr>
<td></td>
<td>(4.91)</td>
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<tr>
<td>Efficiency ratio (target), industry-adjusted</td>
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<td>0.0882</td>
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<tr>
<td></td>
<td>(1.00)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economies of scale</td>
<td>Ln [(market value of target)/(MV of target + acquirer)]</td>
<td>0.0084</td>
<td>0.0016</td>
<td>-0.0005</td>
</tr>
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<td></td>
<td>(0.96)</td>
<td>(0.10)</td>
<td>(0.20)</td>
<td>(-0.93)</td>
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<td>Reduced overinvestment</td>
<td>Payment in cash (dummy)</td>
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<tr>
<td>Method of payment</td>
<td>Payment in stock (dummy)</td>
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<td>(0.56)</td>
<td>(-1.37)</td>
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</tr>
<tr>
<td>$R^2$</td>
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<td>37.41%</td>
<td>41.58%</td>
<td>21.99%</td>
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<td>F-value</td>
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<td>3.64$^b$</td>
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<td># of observations</td>
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<td>56</td>
<td>56</td>
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</tbody>
</table>

$a$, $b$, $c$ indicate statistical significance at the 1%, 5%, and 10% levels.