

Bank Acquisition Determinants: Implications for Small Business Credit

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1. Introduction

Consolidation is a prominent development in the U.S. banking industry, with the number of banks declining from 14,407 to 9,822 between 1980 and 1995. One possible impact on bank customers from banking consolidation could stem from the disruption of historical lending patterns. A lack of short-run substitutes for bank credit would imply that a disruption in the supply of bank credit would have negative consequences for the disrupted borrowers and possibly for the macroeconomy, as argued in the literature reviewed by Bernanke (1993.) This literature argues that smaller, relatively unknown borrowers are the borrowers most likely to rely on bank credit, making bank credit to small businesses particularly important.

Berger, Kashyap and Scalise (1995) consider the impact that banking consolidation may have on small business lending. Given that consolidation shifts banking assets to larger banking organizations and that larger banking organizations tend to devote a smaller fraction of their assets to small business lending, Berger, Kashyap and Scalise argue that the reduction in small business lending from consolidation could be substantial under what they term the “consolidation hypothesis.”

Several other studies have looked at the effect of bank acquisitions on small business lending. Strahan and Weston (1996) examine a sample of banks involved in mergers and compare the small business lending of the banks pre- and post-merger to a sample of banks not involved in mergers. They find that the decline in the percentage of small business loans-to-assets is greater among banks not involved in mergers than among banks involved in mergers. Their findings, therefore, do not support the consolidation hypothesis. Peek and Rosengren (1996) find, however, that for banks in the New England states, the acquisition of a small bank by a large bank

tends to result in a decline in small business lending by the combined organization--evidence consistent with the consolidation hypothesis.

The impact of bank consolidation on small business lending depends on the extent to which large banks restructure the portfolios of the banks they acquire to match their own portfolios. The extent to which this restructuring will occur depends in part on the reason why small banks tend to devote a larger fraction of their assets to small business lending than do large banks. Suppose that small banks devote a relatively large fraction of their assets to small business lending because they face barriers related to their size that prevent them from making more profitable loans to larger borrowers. In that case, restructuring would be likely because the size-related barriers that limited the acquired bank's ability to lend to larger borrowers would be reduced. On the other hand, it is possible that an emphasis on small business lending reflects a profitable niche for small banks. Under that view, it is less likely for the acquiring bank to reduce the acquired bank's small business lending, because the small bank's portfolio is already profitably allocated.

This paper argues that evidence from the bank acquisition market can help to distinguish between the two views of small business lending just discussed. Under the view that an emphasis on small business lending reflects constraints that limit a bank's ability to make other more profitable loans, small business lending would be expected to attract acquirers hoping to profit by reallocating the acquired bank's portfolio to more profitable alternatives. Under the view that an emphasis on small business lending reflects a profitable market niche, an emphasis on small business lending would not attract acquirers.

The link between small business lending and acquisition probability would provide

evidence on the competitive viability of small business lending under the assumption that a broader link between bank performance and acquisition probability exists. To establish whether such a broader link exists, the paper examines the relationship between measures of financial performance and acquisition probability. Evidence showing that acquisitions tend to occur among banks with weak performance would provide support for the hypothesis that mergers can contribute to constructive reshaping of an industry and eliminate players with behavior out-of-step with market forces, as argued by Jensen (1993.)

The remainder of this paper is organized as follows: First, a simple model of bank acquisitions is described. The next section describes the paper's empirical approach. The results are discussed in section four and conclusions are offered in section five.

2. Motivation for Acquisitions

Underlying each acquisition is a difference in valuation between the current owner and the acquirer. Specifically, a necessary condition for an acquisition to occur is

$$V_a > V_c, \quad (1)$$

where V_a is the buyer's valuation of the firm and V_c is the current owner's valuation of the firm. Under risk neutrality, those valuations can be expressed as the discounted sum of expected future profits as in (2).

$$\sum_{t=0}^{\infty} \frac{\Pi_{a,t}^e}{(1+\delta)^t} > \sum_{t=0}^{\infty} \frac{\Pi_{c,t}^e}{(1+\delta)^t} \quad (2)$$

where π_{at}^e denotes the potential acquirer's expectation of the profit that the bank could generate at time t under the acquirer's ownership, π_{ct}^e denotes the current owner's expectation of the profit that the bank could generate at time t under the current owner's ownership, and δ is a discount rate.¹

Profit at time t can be expressed as

$$\Pi_t = \Pi^* + s_{j_t} + u_t \quad (3)$$

where π^* is average industry profitability, s_{jt} is a deviation from industry profitability attributable to the bank's owner ($j=c$ for the current owner and $j=a$ for the acquirer), and u_t is a transitory shock to profitability attributable to nature. s_{jt} is assumed to follow an AR(1) process and u_t is assumed to be independently and identically distributed over time, with mean zero.² Finally, it is assumed that potential acquirers observe π_t but not s_{ct} .

Combining (1), (2), and (3) implies

¹In the discussion that follows, it will be convenient to view bank assets as normalized to one.

²While it is inessential for s_{jt} to follow an AR(1) process, some persistence in s_{jt} over time is needed to make π_t informative for s_{jt+k} when $k>0$.

$$\sum_{t=0}^{\infty} \frac{s_{a,t}^e}{(1+\delta)^t} > \sum_{t=0}^{\infty} \frac{s_{c,t}^e}{(1+\delta)^t} \quad (4)$$

Thus, mergers are motivated by differences in expectations of profitability between the current owner and prospective acquirers.³

3. Empirical Approach

The empirical work is motivated by (4). Specifically, factors that can potentially reflect differences in expectations of profitability between the current owner and potential acquirer are included in the empirical model of acquisition probability given in (5).

$$P_m = f(\text{ROA}, \text{MKTSH}, \text{KAP}, \text{GRO}, \text{LOAN}, \text{SBL}, \text{ASSET}, \text{HHI}, \text{RURAL}, \text{TIME}) \quad (5)$$

³In addition to mergers, there are other avenues for changes in corporate control that can occur for banking organizations where profitability could be increased. Prowse (1995) studies the operation of these forces in large bank holding companies. He finds that poor performance is associated with an increased probability of management turnover or regulatory intervention, but not with an increased probability of a friendly merger. In one sense, Prowse's results could be viewed as conflicting with those of this study, because I find poor performance associated with an increased acquisition probability whereas he does not. It is not surprising, however, that the two studies come to these seemingly different conclusions, given that they are based on different samples of banks (large bank holding companies with publicly traded stock vs. independent banks) and different periods (1987-92 vs. 1993-96.) One way that the difference in periods may have affected the results is that in the earlier period banking conditions were not as favorable as they were in the latter period; it is possible that the merger market operates differently when an industry is "up" than when the industry is "down." Finally, banks in my study were classified as either acquired or not acquired; in the Prowse study, however, banks could also fall into the category of "regulatory intervention." Given the difficulties in banking during 1987-92, some troubled banks would have fallen into the regulatory intervention category, but eventually would have been acquired by another bank; thus, weak performance would still lead to merger, but with an intermediate step of regulatory intervention.

where the subscripts referring to bank j and to time have been deleted. P_m is the probability that the bank will be acquired during the year, where $m=i$ refers to acquisition by an in-market acquirer and $m=o$ refers to acquisition by an out-of-market acquirer. In addition, in the discussion below, P without a subscript refers to the probability of being acquired by either an in-market or out-of-market acquirer. Table 1 gives detailed definitions of the variables in (5).

A multinomial logit model is used to estimate (5). The multinomial logit approach allows the effect of the explanatory variables to differ for acquisitions where the acquiring and acquired banks are located in the same market versus acquisitions where the acquiring and acquired bank are located in different markets.⁴ The banking market is defined as the bank's SMSA for urban banks and as the bank's county for banks outside urban areas.

ROA is the bank's return on assets and serves as the measure of Π_t . Under (3), Π_t will be positively correlated with $s_{ct}, s_{ct+1}, s_{ct+2}, \dots$, implying that (4) is less likely to hold for higher values of Π_t . Thus, in (5), *ROA* is expected to have a negative influence on P for both in-market and out-of-market acquisitions.⁵

MKTSH is the bank's share of banking assets in its market. To the extent that success in competing for market share reflects success more generally, a high market share would imply a high s_{ct} , thus reducing the probability that (4) would hold. In (5), *MKTSH* is expected to have a

⁴Hannan and Rhoades (1987) also estimate bank acquisition probability using a multinomial logit model. Unlike this study, they do not find a significant relationship between weak financial performance and acquisition probability. While the present study uses a nationwide sample of banks from the 1990s, Hannan and Rhoades examined Texas banks from 1971-82. The difference in sample is a likely source of the difference in results.

⁵In addition to the current value of Π_t , the postulated model implies that historical values of Π_t would also be informative for current and future values of s_{ct} . For simplicity, however, only the current value of Π_t is used in the estimation of (5).

negative sign.⁶

KAP is the bank's capital-to-asset ratio. As mentioned in footnote 5, historical profitability, in addition to current profitability, would be informative for current and future values of s_{ct} . The dollar amount of a bank's capital would be influenced by its historical profitability. If the bank's asset base is somewhat inelastic, there would be a positive correlation between *KAP* and historical profitability. Higher values of *KAP* would therefore be associated with lower *P*.⁷

GRO is the bank's growth in total assets. If the ability to grow is linked to s_{ct} , then higher values of *GRO* would be associated with lower values of *P*. In addition to the ability to grow, there could also be differences of opinion between the acquirer and the current owner about the desired rate of growth; if an acquirer believed that profitability could be enhanced through more rapid growth, then slow growth would increase *P*, providing an additional channel through which higher *GRO* would be associated with lower *P*.

LOAN is the bank's ratio of loans to assets, where loans exclude small business loans. If a bank's current circumstances impose constraints on its ability to lend that are more severe than the constraints that would exist under different ownership, then (4) would be likely to be satisfied, making an acquisition likely to occur. Thus, a negative relationship between *LOAN* and *P* is expected.

⁶Beyond the information it conveys for s_{ct} , *MKTSH* would also be likely to have a negative effect on the probability of being acquired by an in-market acquirer, in that for banks with a high market share, there may not be any potential in-market acquirers large enough to acquire the bank. Moreover, regulatory concern about potential anticompetitive effects could also create a negative relationship between *MKTSH* and the probability of being acquired by an in-market acquirer.

⁷Other authors argue, however, that high capital ratios would tend to increase *P* because an excessively high capital ratio implies unexploited growth opportunities (Hannan and Rhoades (1987)).

SBL is the bank's ratio of small business loans to assets.⁸ Similar to the argument for *LOAN*, if a high *SBL* stems from constraints that limit the current owner's ability to make other types of loans and these constraints could be relaxed by an acquirer, then (4) would be likely to be satisfied and an acquisition would be likely to occur. If, on the other hand, a high *SBL* reflects a choice to emphasize small business lending as a viable business strategy, then there would not be gains from relaxing such constraints, (4) would not be likely to hold, and an acquisition would not be likely. Thus, beyond explaining acquisitions, including *SBL* in (5) offers insight on whether some banks' emphasis on small business lending stems from constraints that limit their ability to make other, more profitable types of loans or whether such lending is a viable business strategy aside from such constraints. Whether these constraints exist is likely to have an impact on the outlook for bank lending to small business as the banking industry consolidates. If constraints are an important force behind much of small business lending, and consolidation is relaxing those constraints, then bank lending to small businesses would be likely to fall. If, on the other hand, some banks have chosen to emphasize small business lending despite the absence of constraints, then small business lending is likely to retain its place in the banking industry's portfolio.

⁸Klemme (1993) describes the call report data on small business lending and some of its shortcomings. The call report data divide loans according to their original amount: \$100,000 or less; \$100,000 to \$250,000; or \$250,000 to \$1 million. Within these size categories, the call report divides the loans into loans secured by nonfarm nonresidential real estate, and commercial and industrial loans to U.S. addresses. I include all of these components in my measure of banks' small business lending. The first shortcoming of the data Klemme describes is that loans are categorized as small business loans based on the size of the loan instead of the size of the borrower; a large borrower could have a small loan, for example. Second, small business credit that banks extend by lending against the small business owners' residence is not captured, nor is credit extended through credit cards included as credit to small businesses. Similar findings using other data help to allay these concerns about the data, however. Using data from the Federal Reserve's Survey of Terms of Bank Lending to Businesses, Berger, Kashyap, and Scalise (1995) find that small banks tend to devote a larger fraction of their assets to small business loans than large banks do in accordance with Klemme's finding based on the call report data.

ASSET is the bank's total assets, in logarithms. Given that the reduction in the number of banks is almost entirely accounted for by the reduction in the number of small banks, the question of whether small size itself places a bank at a competitive disadvantage arises, i.e., does small size impose constraints that limit a bank's s_{ct} ? If so, the acquisition of the bank by a larger acquirer would relax the constraints on profitability imposed by small size, implying that (4) would be satisfied and an acquisition would be likely to occur; hence a negative relationship between *ASSET* and *P* would exist. If such constraints do not exist, however, then *ASSET* and *P* would be unrelated.

HHI is the concentration of the bank's market, as measured by the Hirschman-Herfindahl index. For in-market acquisitions, the regulatory treatment of mergers for antitrust considerations can result in acquisitions failing to occur even if (4) holds. Thus, the *HHI* is expected to have a negative relationship with P_i . No prediction is made, however, about the relationship between *HHI* and P_o .

RURAL equals one for banks outside urban areas and equals zero for banks located in urban areas. Difficulty in operating geographically remote banks implies that (4) is unlikely to hold for potential out-of-market acquirers, so that a negative relationship between *RURAL* and P_o is likely to occur. The predicted relationship between *RURAL* and P_i is left open.

Finally, *TIME* is a vector of dummy variables reflecting the year. These time dummies are intended to capture differences in merger activity across years that are not explained by the other variables in the model.

The data on mergers come from the National Information Center database and banks' financial data come from the Report of Condition and Income ("Call Report.") For reasons

described below, the sample is limited to independent banks or banks belonging to one-bank holding companies. The paper considers mergers that transpired between June 1993 and June 1996.⁹ In estimating (5), the explanatory variables as of June of year t are allowed to influence mergers occurring from July of year t through June of year $t+1$.

The sample is limited to independent banks, i.e., banks either not belonging to a holding company or belonging to a one-bank holding company. Banks belonging to multibank holding companies are not as well-suited to the type of merger analysis conducted in this paper as are independent banks. Banks belonging to multibank holding companies may merge with banks belonging to the same parent company; such mergers could merely reflect a holding company merging its subsidiary banks because of a relaxation of branching restrictions. Alternatively, mergers of banks under a common holding company could reflect the union of banks that were formerly economically distinct. Following a merger of bank holding companies, their subsidiary banks will have a common holding company; if the target company's banks are eventually merged with the acquiring company's banks, the resulting bank merger would be reflected as a merger of banks under a common holding company. Distinguishing between these two types of mergers is problematic.

Another difficulty in analyzing mergers of banks belonging to multibank bank holding companies is that the effect of individual bank characteristics on acquisition probability may be diluted. Mergers for such banks may result from "package deals," in which one bank holding company acquires another bank holding company and then merges the subsidiary banks of the

⁹The sample is limited to this period because data on banks' small business lending are unavailable before June 1993.

acquired company into its own banks. Given that the mergers come as package deals, the attributes of an individual bank lose importance in explaining the probability of the bank being acquired, because the acquisition probability depends not only on the bank's own characteristics, but also on the characteristics of the other banks held by its parent company.

4. Results

Table 2 presents estimates of the multinomial logit parameters. As noted in Greene (1993) the multinomial logit model parameter estimates associated with an explanatory variable do not necessarily have the same sign as the partial derivatives of P with respect to that explanatory variable. Thus, to augment the parameter estimates themselves, Table 3 presents the partial derivatives of P with respect to the explanatory variables. The results in Table 3 show that for both in-market and out-of-market acquisitions, there is a statistically significant negative relationship between ROA and P . Thus, weak profitability tends to result in acquisitions, in accordance with the postulated model wherein potential acquirers view low profitability as a signal indicating room for improvement.^{10, 11}

¹⁰One reason for an acquisition is bank failure; if a bank fails, it may then be acquired by another bank. If failed banks are excluded from the sample, profitability loses its statistical significance for out-of-market acquisitions, but remains significant for in-market acquisitions. Bank failure, however, represents a situation where a lack of profitability starkly illustrates the existence of room for improved performance. The exclusion of failed banks does not affect the sign or statistical significance of the other variables in the model.

¹¹In addition to the model reported in Tables 2 and 3, an alternative specification where a bank's profitability was measured as the difference between the bank's return on assets and the average return on assets in its market produced similar results. Banks with a high return on assets relative to the return on assets in their banking market were less likely to be acquired than were banks with a low return on assets relative to the return on assets in their banking market. Thus, the profitability result does not stem from

MKTSH, *KAP*, *GRO*, and *LOAN* also have statistically significant, negative relationships with *P* for both in-market and out-of-market acquisitions. Under the postulated model, this suggests that these variables are indicative of the owner's ability to earn profits; when potential acquirers observe a bank where one or more of these variables is high, they are less likely to believe that they can run the bank more profitably than its current owner, and hence are less likely to acquire it.

SBL, however, does not exhibit a statistically significant relationship with *P* for either in-market or out-of-market acquisitions. This implies that the emphasis that some banks place on small business lending does not stem from constraints that prevent those banks from pursuing other, potentially more profitable types of lending; if such constraints existed, then a potential acquirer that did not face such constraints could profit by acquiring the bank and relaxing those constraints. This evidence showing that small business lending is not an artifact of constraints augurs well for the availability of small business credit from banks going forward, despite the bank consolidation trend.

A similar argument applies to the finding of an insignificant relationship between *ASSET* and *P* for both in-market and out-of-market acquisitions. If small size were an impediment to profitability, there would be a tendency for small size to attract acquirers. By becoming part of a larger organization, the constraints on profitability, if any, related to small size would be relaxed, making the bank more valuable to a potential acquirer than to the current owner. The lack of a significant relationship between *ASSET* and *P*, however, suggests that such constraints are not important.

acquisitions being targeted on banks operating in distressed banking markets.

The estimated relationship between HHI and P differs for in-market and out-of-market acquisitions. There is not a statistically significant relationship between HHI and P_i , but there is a statistically significant, positive relationship between HHI and P_o . These results suggest that concentrated markets attract entry, including entry by acquisition.

The estimated relationship between $RURAL$ and P also differs for in-market and out-of-market acquisitions. A rural location is associated with a lower P_i , but a rural location does not have a statistically significant relationship with P_o . The negative relationship between operating in a rural location and P_i may reflect the relative paucity of potential in-market acquirers that exists in many rural markets.

Finally, the dummy variables for the years were insignificant, with the exception of the dummy variable for 1993, which was negative and significant for 1993 for out-of-market acquisitions.

5. Conclusion

This paper argues that acquisitions stem from an acquirer's belief that he can operate the target bank more profitably than the current owner believes he can operate the bank; such a difference in beliefs then leads the acquirer to value the bank more highly than the current owner values the bank, creating the possibility of mutual benefit from the transfer of ownership of the bank. In support of this view, the results show that acquisition is more likely for banks with relatively weak performance.

Under the premise that mergers stem from differences in beliefs about the profitability of

banks under current versus new ownership, evidence from the merger market offers insight into the outlook for bank lending to small businesses. That outlook depends on the historical motivation for some banks' emphasis on lending to small business. If banks that have historically emphasized lending to small businesses have done so because of constraints that limit their ability to make other, more profitable types of loans, then an emphasis on small business lending would tend to attract acquirers seeking to profit by relaxing those constraints. The findings here, however, show that an emphasis on small business lending does not attract acquirors, arguing against the existence of such constraints. This evidence augurs well for the future of bank lending to small business.

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Table 1. Variable Definitions

Variable	Definition
<i>ROA</i>	annualized net income/average assets
<i>MKTSH</i>	bank assets/assets in banking market
<i>KAP</i>	equity capital/total assets
<i>GRO</i>	(total assets/total assets one year earlier)-1
<i>LOAN</i>	(total loans and leases - small business loans)/gross assets
<i>SBL</i>	small business loans/gross assets
<i>ASSET</i>	ln (total assets, \$thousands)
<i>HHI</i>	Hirschman-Herfindahl Index
<i>RURAL</i>	=1 if bank is located outside SMSA, 0 otherwise
<i>TIME93</i>	=1 if year is 1993, 0 otherwise
<i>TIME94</i>	=1 if year is 1994, 0 otherwise

Table 2. Maximum Likelihood Parameter Estimates from the Multinomial Logit Model of Acquisition Probability^a

	In-Market	Out-of-Market
Intercept	-0.613 (0.871)	-3.28** (0.756)
<i>ROA</i>	-14.3** (4.00)	-17.4** (3.86)
<i>MKTSH</i>	-5.32** (1.07)	-0.775* (0.328)
<i>KAP</i>	-5.99** (2.01)	-11.8** (2.18)
<i>GRO</i>	-2.65** (0.504)	-2.00** (0.462)
<i>LOAN</i>	-2.87** (0.502)	-0.947* (0.427)
<i>SBL</i>	0.684 (0.533)	0.704 (0.537)
<i>ASSET</i>	-0.101 (0.0705)	0.0596 (0.0578)
<i>HHI</i>	-0.512 (0.479)	1.67** (0.334)
<i>RURAL</i>	-0.445* (0.222)	-0.119 (0.151)
<i>TIME93</i>	-0.107 (0.150)	-0.411** (0.136)
<i>TIME94</i>	-0.199 (0.155)	0.0215 (0.123)

^aTo avoid indeterminacy the coefficients associated with the event of non-acquisition are set equal to zero.

* and ** denote statistical significance at the 5- and 1-percent levels, respectively. n=21,907
Standard errors are shown in parentheses.

Table 3. Partial Derivatives of the Probability of Being Acquired with Respect to the Independent Variables in the Acquisition Model^a

	In-Market	Out-of-Market
Intercept	-2.79 (4.32)	-45.9** (11.0)
<i>ROA</i>	-69.3** (21.9)	-244** (55.7)
<i>MKTSH</i>	-26.2** (8.63)	-10.5* (4.69)
<i>KAP</i>	-28.7** (11.1)	-165** (35.3)
<i>GRO</i>	-12.9** (3.35)	-27.9** (7.14)
<i>LOAN</i>	-14.1** (3.46)	-13.1* (6.12)
<i>SBL</i>	3.32 (2.67)	9.82 (7.58)
<i>ASSET</i>	-0.503 (0.348)	0.843 (0.814)
<i>HHI</i>	-2.64 (2.42)	23.4** (5.15)
<i>RURAL</i>	-2.18* (1.05)	-1.64 (2.12)
<i>TIME93</i>	-0.497 (0.744)	-5.75** (2.00)
<i>TIME94</i>	-0.983 (0.784)	0.316 (1.72)

^aThe partial derivatives are computed at the means of the independent variables. To enhance readability, all estimates shown are 1000 times actual estimates.

* and ** denote statistical significance at the 5- and 1-percent levels, respectively. n=21,907
Standard errors are shown in parentheses.